Annex EDP 24
2012 Amphibian Survey Report (CBA, 2012)

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cba

London Resort Company Holdings (LRCH) Ltd.

London Paramount

2012 Amphibian Survey Report

November 2012

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2012 Amphibian Survey Report

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1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings (LRCH) Ltd. to undertake a series of ecological surveys to inform the Environmental Impact Assessment for the proposed London Paramount development at Swanscombe, North Kent.

1.1.2 This report details the results of the amphibian survey undertaken between April and June 2012.

1.2 Scope

1.2.1 The scope of the survey was to determine:

- habitat suitability assessments for all waterbodies within the proposed development area that have the potential to support amphibians; and
- the presence and status of amphibians using a series of ponds and ditches, with specific reference to great crested newts *Triturus cristatus* (a species considered fully protected by law).

Survey Limitations

1.2.2 Most of the waterbodies consisted of steep-sided, deep water, lagoons, ditches and drains, many of which contained significant deposits of silt. The waterbodies were too deep for surveyors to safely wade in and be able to set traps effectively and therefore for both health and safety and practical reasons, it was not possible to deploy bottle trapping as a survey technique.

1.2.3 Additionally, some waterbodies within 500m of the proposed development area were not surveyed due to access restrictions.

1.3 Key Findings

Great Crested Newts

1.3.1 The results of the amphibian survey suggest that great crested newts are not present in any of the surveyed water bodies on the Swanscombe peninsula north of the A226. No signs of this species were recorded during the survey in 2012 and the desk-top study revealed no historical records either. The HSI scores suggest that most of the water bodies on the peninsula are highly

suitable habitats so it may be that the A226 as a busy main road has proved to be an effective barrier preventing colonisation of this area.

1.3.2 Further survey work may be required to establish whether or not great crested newts are present elsewhere within the proposed development area, but for which access has not yet been possible. The lake in Bamber pit where great crested newts were recorded in 1985 scored just 0.41 on the HSI due to the high densities of fish. It may be that the fish were introduced to the lake since the record was made as it now seems highly unlikely great crested newts are found in this area.

Other Amphibian Species

1.3.3 The results of the survey suggest that a small population of smooth newts and an unknown population of marsh frogs are found on the Swanscombe peninsula, mainly concentrated around Swanscombe Marshes.

2.0 METHODOLOGY

2.1 Background

2.1.1 There are six native species of amphibian in the UK of which five, common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus*, and great crested newt could be expected to occur within the proposed development area. The sixth, natterjack toad *Bufo calamita*, is very restricted in its distribution and does not occur within or near to the proposed development area.

2.2 Great Crested Newt Ecology

2.2.1 The great crested newt is the largest of the three British native newt species, reaching a maximum length of 14.5cm for males and 16cm for females. Great crested newts spend much of the year on land where they need a variety of different conditions to provide food, shelter and places to spend the winter. Like all amphibians, great crested newts rely on water for breeding and for the development of the larval stage and so return to ponds in the spring to breed. Eggs are laid singly on underwater leaves near the water margin between late February and early August, but usually between April and June, with each female laying several hundred eggs. The efts normally take three months to develop into young newts before leaving the water, but some may over-winter as efts. Juvenile newts disperse up to 1km, only returning to ponds to breed when sexually mature after one to three years. Adult newts leave the ponds from July onwards, generally staying within 200 – 500m of the ponds. From October or November, they hibernate in damp, frost-free environments, sometimes underground.

2.2.2 On land, great crested newts are found in cool, moist conditions under debris or in dense vegetation. They feed on both land and in water, eating small aquatic animals such as water fleas and insect larvae and terrestrial invertebrates, especially worms.

2.2.3 Despite the decline of this species in recent years, the great crested newt is still quite widespread in Great Britain and is numerous locally in parts of lowland England. Studies in the 1980's indicated a national rate of colony loss of approximately 2% over five years. The decline can be put down to loss of suitable breeding ponds caused by water table reduction, in-filling for development, changing farming practices, waste disposal, neglect or fish stocking and the degradation, loss and fragmentation of terrestrial habitats. The British population remains, however, among the largest in Europe and Britain therefore has an international responsibility for the species.

2.3 Legislation

2.3.1 All British amphibian species receive legal conservation protection in the United Kingdom, though the degree to which different species are protected varies.

2.3.2 The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was recently amended by the Countryside and Rights of Way (CRoW) Act 2000. The great crested newt is considered 'fully protected' as it is listed under Schedule 5 of the 1981 Act, and is therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a great crested newt [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a great crested newt [Section 9(2)];
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt [Section 9(4)(a)];
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose [Section 9(4)(b)];
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a great crested newt [section 9(5)].

2.3.3 The other more common amphibian species are protected against sale (Section 9(5)) only. In all cases, the legislation applies to all life stages including, eggs, efts (the larval stage), juveniles and adults.

2.3.4 The great crested newt is a UK Biodiversity Action Plan priority species and is considered sufficiently threatened in Europe to be included in the Habitats Directive and the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations'). The Habitats Regulations transpose into UK law Council Directive 92/43/EEC of the 21st May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats (and Species) Directive). The great crested newt is listed on Annex II and Annex IV (European protected species). Annex II relates to the designations of special areas of conservation (SACs) for this species (underlining their conservation significance even where they occur outside SACs). Annex IV requires member states to construct a system of protection as outlined in Article 12, this is done through inclusion on Schedule 2 of the Regulations. Regulation 39 makes it an offence to:

- Deliberately capture or kill a great crested newt [Regulation 39(1)(a)].
- Deliberately disturb a great crested newt [Regulation 39(1)(b)].
- Deliberately take or destroy the eggs of a great crested newt [regulation (1)(c].
- Damage or destroy a breeding site or resting place of a great crested newt [Regulation 39(1)(d)].

2.4 Scope of Survey

2.4.1 The requirement to undertake an amphibian survey results from the protected status of the great crested newt and its possible presence within the development area, identified during the desk-top study and Phase 1 habitat survey carried out in April-May 2012. The main body of the proposed development area (north of the A226) supports a large network of ditches and 8 lakes/ponds. In addition there are two large lakes in former quarries located south of the A226. The water bodies north of the A226 are linked by a mosaic of terrestrial habitats of varying quality for supporting amphibians, whilst the lakes south of the A226 appear to be isolated.

2.4.2 The results of the desk-top study, showing the locations of amphibian records in and around Swanscombe are displayed in **Figure 1.** Only species records provided by Kent and Medway Biological Records Centre (KMBRC) with an accurate grid reference of at least 6 figures (100m square) are displayed. This left just relatively few amphibian records in the Swanscombe area, with a distinct lack of records on the peninsula north of the A226.

2.4.3 The results of the Phase 1 habitat survey suggest that overall there is a large amount of suitable habitat for amphibians on the peninsula which is mainly comprised of rough grassland and scrub, and with small areas of broadleaved woodland. Most of this habitat is continuous and links to a number of ditches and ponds. South of the A226 the largest continuous blocks of suitable habitat are present in Bamber pit and surrounding locations in Ebbsfleet valley where areas of rough grassland, scrub and woodland are present.

2.5 Survey Methodology

2.5.1 Within the main body of the proposed development area (north of the A226) the following water bodies were surveyed for amphibians:

- the network of drainage ditches on Swanscombe Marshes (D2-D5, D7 & D9)
- the drainage ditches to the east and west of the Channel Tunnel Rail Link (HS1) and old sewage works (D10-D12)
- the pond situated north-west of the old sewage works (P3)
- the pond situated north-east of the old sewage works (P4)
- the ponds south of the HS1 (P5)

2.5.2 The remaining water bodies were deemed unsuitable for great crested newts (mainly due to being choked with reed), too dangerous to access or permission had not been given to access the land on which they are situated. The locations of all the water bodies surveyed are set out in **Figure 2** and descriptions of each are provided below.

2.5.3 Surveys were conducted on 4 separate occasions from 30th April to 15th June 2012 between the hours of 20:30 and 23:30. Torchlight surveys and egg searches were the principal survey techniques used. Bottle trapping was not used as a technique due to the difficulty of accessing steep sided ditches, containing in excess of 1m depth water and deep deposits of silt. On each night of survey the water bodies were given a vegetation and turbidity score between 0 and 5. A vegetation score of 0 indicating a water body clear of vegetation and 5 completely choked. A turbidity score of 0 indicating a clear water body and 5 extremely murky.

2.5.4 The surveys were carried out in suitable weather conditions, according to guidance provided by the Herpetofauna Groups of Britain and Ireland (HGBI)[1] and Froglife[2]. Torching was undertaken shortly after dusk on still, warm evenings above 5ºC with the aid of a 1 million candle power torch. Full details of the weather conditions during the surveys are given in **Table 2.**

2.5.5 The surveys were specifically aimed at detecting great crested newts in their various life stages, but also included surveys for other amphibians and incidental fish records, particularly as fish can have a determining influence on the presence of great crested newts.

2.5.6 Smooth and palmate newts can be difficult to distinguish in the field using torchlight searches so where the species was uncertain the record was made as smooth/palmate newt.

2.6 Evaluation Methodology

2.6.1 In order to assess the importance of the ponds in relation to their amphibian assemblages the population size class assessment set out in Section 5.8.3 of the English Nature guidelines[3] was used. The purpose for using this assessment is to recognise the inherent difficulty and range of factors that can affect the determination of the size of a given population. As EN's guidelines state "… surveys may reveal from around 2% to 30% of the population … recent evidence has revealed even greater variation". EN therefore recommends the use of the following size classifications as a minimum for interpreting survey results. The size classifications are set out in **Table 1** below.

Table 1 Great Crested Newt Population Size Class Assessment

Species	Low/Small Population	Good/Medium Population	Exceptional/Large
Great crested newt	<10	11-100	>100

[1] HGBI (1998) *Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards.* HGBI Advisory Notes (ARGs). HGBI, c/o Froglife, Halesworth, Unpubl.
[2] Froglife (2003) *Advice Sheet 11 – Surveying for (Great Crested) Newt Conservation.* Froglife, Halesworth.
[3] English Nature (2001) *Great Crested Newt Mitigation Guidelines.*

2.6.2 The results of the surveys can be further supported using data relating to the quality of the pond and surrounding terrestrial habitat. This is known as the Habitat Suitability Index (HSI), or Oldham Criteria, after the paper's author (Oldham *et al*, 2000[4]). This methodology enables the ponds to be evaluated for their suitability for great crested newts, against a set of defined criteria. The calculation produces a figure in the range 0 – 1, where the closer the figure tends towards 1, the better the quality of habitat.

[4] Oldham, R. S., Keeble, J., Swan, M. J. S. and Jefcote, M. (2000). *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus)*. Herpetological Journal **10** pp143-155.

3.0 RESULTS

3.1 Water Body Descriptions

Ditch Descriptions

3.1.1 The ditches surveyed have been labelled D (Ditch) 1 to D16 respectively and are shown in **Figure 2**.

3.1.2 **D1:** This is a short section of ditch in the south-west corner of the survey area. It has approximately 100m long and 5m wide with very steep sides and shallow water that drains into a culvert. It is mainly shaded by scrub and has hard standing on the banks.

3.1.3 **D2:** This ditch is sandwiched between the edge of Swanscombe Marshes and an area of rough grassland with scattered scrub. The ditch itself is approximately 200m long and 5m wide with open water in the channel to a depth of 0.5m. The west margin is fringed by common reed and to the east there is bracken *Pteridium aquilinum* and bramble *Rubus fruticosus* scrub.

3.1.4 **D3:** This ditch runs along the northern boundary of some broadleaved woodland in the south-west corner of the survey area. It is approximately 500m long, 6m wide and 0.5m deep. The southern margin is overhung by trees leaving the water quite shaded and the eastern boundary is heavily scrubbed with bramble along much of its length. To the north of the ditch is Swanscombe Marshes.

3.1.5 **D4-D7:** These ditches dividing Swanscombe Marshes are all quite similar in character. Typically they are 6m wide with common reed *Phragmites australis* dominating the bank and channel vegetation. There is little other vegetation besides the occasional patches of reedmace *Typha latifolia*. Water depth in the channels is variable but in most there are quite large areas of open water. The approximate lengths of the ditches are as follows:

- D4 – 650m
- D5 – 300m
- D6 – 200m
- D7 – 150m

3.1.6 **D8-D9:** These ditches are situated at the east of Swanscombe Marshes and are mostly inaccessible as they are surrounded by dense scrub. D8 is approximately 250m long and D9 500m. Both look to be approximately 6m wide with open water up to 1m deep.

3.1.7 **D10:** This ditch runs along the eastern boundary of a landfill and is bordered on the west by dense hawthorn *Crataegus monogyna* and willow *Salix spp.* scrub that grades into a narrow woodland belt. On the eastern boundary there is a fringe of common reed and some emergent reedmace. It is steep-sided, approximately 500m long, 5m wide and with standing water in the channel at variable depth. Moving south to north the water drops from around 0.5m to a negligible depth where vegetation chokes the channel. Numerous fish were observed in the ditch, possibly sticklebacks.

3.1.8 **D11:** This ditch runs opposite to D10 bordering P5, the old sewage works and another landfill. It is approximately 750m long and 5m wide with varying water depth along its length. In three locations it opens up into small pools of water approximately 0.5m deep but along most of its length the channel is quite heavily vegetated with common reed and reedmace and there are no areas of open water. In the pools numerous fish were observed, again possibly sticklebacks. At the north end there is a section of ditch that looks to have recently been dredged, allowing shallow water to flow into a culvert.

3.1.9 **D12:** This ditch runs along the northern margin of a landfill and to the east of a large area of swamp. It is approximately 900m long, 5m wide and has very shallow (5cm) or no standing water along much of its length. The channel has become totally choked with common reed and it looks soon to dry up completely.

3.1.10 **D13:** This is a French drain that runs along the southern boundary of a planted shelterbelt and then appears to feed P4. It is approximately 1000m long, 2m wide and up to 1m deep. For much of its length a gravel bottom can be seen.

3.1.11 **D14:** This is a dry ditch bordering the southern margin of a large area of ephemeral/short perennial vegetation central to the survey area. It is approximately 200m long, 1m wide and 0.5m deep. It does not appear to ever collect water.

3.1.12 **D15:** This ditch is a part of the River Ebbsfleet that opens up next to the A226 at the southern end of the survey area. It is approximately 150m long, 5m wide and has standing water around 0.5m deep. The ditch is mainly surrounded by dense scrub and an area of swamp to the east and the main road borders the western side. In terms of the wider landscape the ditch is in a highly fragmented habitat with a large lake (P9), main roads and urban development all in close proximity.

3.1.13 **D16:** This ditch runs parallel to D16 and is very similar in character. It is approximately 400m long, 3m wide and up to 1m deep. There is little or no standing water along much of its length, the channel is choked with common reed and it looks soon to dry up completely. In terms of

the wider landscape this ditch borders the western margin of Botany Marshes, a large area of cattle-grazed grassland.

Lake/Pond Descriptions

3.1.14 The lakes and ponds surveyed have been labelled P (Pond) 1 to P10 respectively and are shown in **Figure 2**.

3.1.15 **P1:** This lake is situated immediately north of the A226 in the south-west corner of the survey area that has developed in an old quarry. It is approximately 9500m^2 in size with a perimeter of around 450m and unknown depth. It is surrounded by very steep sides covered by woodland and dense willow scrub and was deemed inaccessible and dangerous to survey. There is little apparent aquatic vegetation except for the occasional clumps of hard rush *Juncus inflexus*. Waterfowl were observed using this lake during the Phase 1 habitat surveys carried out by CBA. In terms of the wider landscape the lake is bordered by rough grassland and woodland to the north and east, a main road to the south and urban development to the west.

3.1.16 **P2:** This pond is situated at the bottom of a very steep sided valley in the north-west corner of the survey area. It is too dangerous to access but appears to be approximately 700m^2 in size with a perimeter of around 100m. Woodland and scrub line the banks and there is a lot of rubbish strewn down the sides and in the water at the bottom. Much of the pond looked to be shaded by the trees. In terms of the wider landscape there are large areas of woodland, rough grassland and scrub to the east and urban development to the west.

3.1.17 **P3:** This lake is situated between two former landfills at the north end of the survey area. It is roughly rectangular in shape, 7500m^2 in size and has a 425m perimeter. Most of this perimeter is fringed by common reed and there is a strip of broadleaved woodland on the western banks. There is little to no aquatic vegetation visible and the water was discoloured red/brown, possibly contaminated by landfill leachate. Waterfowl have been observed using this water body. In terms of the wider landscape it is surrounded by extensive areas of rough grassland, scrub, ditches and woodland.

3.1.18 **P4:** This pond is situated to the north-west of Botany Marshes and looks like it was recently created or modified. It is quite uniformly rectangular, approximately 900m^2 in size with a 125m perimeter. The banks are steep with bare soil and the water quality looks very poor. It is red/brown in colour, possibly contaminated with landfill leachate and there is little/no aquatic vegetation or invertebrates to be seen. In terms of the wider landscape this pond is surrounded by extensive areas of rough grassland, scrub and ditches.

3.1.19 **P5:** This is a series of shallow ponds situated immediately south of the HS1. They are rapidly becoming vegetated over by common reed and reedmace and the open water remaining probably exceeds no more than 2000m^2 in extent. The average depth of water in the pools is no more than 0.1m. The ponds grade into marshy grassland to the south with hard rush, creeping bent *Agrostis stolonifera* and great willowherb *Epilobium hirsutum*. Waterfowl and small fish, possibly sticklebacks, have been observed using these water bodies. In terms of the wider landscape the ponds are surrounded by large areas of ephemeral/short perennial vegetation, scrub, ditches and rough grassland. The HS1 presents a potential barrier to the north.

3.1.20 **P6:** This lake is situated between the HS1 and old sewage works. It appears to be man-made and covers a large area approximately 14000m^2 in size with a 950m perimeter. The extent of open water looks to be much less than this as the lake is surrounded by a very large swamp and common reed is encroaching. Several species of waterfowl have been observed on the lake including tufted duck *Aythya fuligula* and mute swan *Cygnus olor*. In terms of the wider landscape this lake is mainly surrounded by swamp, the cattle-grazed fields of Botany Marshes are to the east and the HS1 is situated to the south.

3.1.21 **P7:** This pond is situated just north of the A226 within an industrial estate. It is roughly circular in shape, 7000m^2 in size and has a 300m perimeter. The surrounding banks looked to have been recently disturbed and were characterised by ruderal vegetation. Waterfowl were observed using this pond during the Phase 1 habitat survey. In terms of the wider landscape only the northern boundary of the pond features suitable terrestrial habitat for amphibians where large areas of rough grassland and scrub can be found.

3.1.22 **P8:** This lake is situated at the base of a large former quarry pit just south of the A226. It is approximately 5000m^2 in size with a 350m perimeter and unknown depth. The steep sides are covered with dense scrub and mature trees. Large fish, possibly carp, were observed in the water. The quarry within which the lake is situated is approximately 11ha and comprises a complex mosaic of short and tall grassland, scrub, and birch woodland.

3.1.23 **P9:** This very large lake fills the bottom of an old quarry pit east of the A226 in the south-east corner of the survey area. It is over 100,000m^2 in size with a perimeter of approximately 1500m. It is surrounded by very steep chalk escarpments with dense scrub and in terms of the wider landscape it is mostly enclosed by main roads, the HS1 and urban development.

3.1.24 **P10:** This is a small, shallow pool of water that extends from the ditches on Botany Marshes. It is no more than 750m^2 in size with a 150m perimeter and is heavily vegetated with reed. The water is likely to dry up during seasons with little rainfall. There is little to no aquatic

vegetation visible and the water was discoloured red/brown, possibly contaminated by landfill leachate. In terms of the wider landscape the pond is surrounded by large areas of rough grassland.

3.2 Survey Results

3.2.1 Weather conditions during the survey are summarised in **Table 2**. Every evening was dry and warm with a varying degree of cloud cover.

3.2.2 The full results of the survey are given in **Tables 3-6** and shown in **Figure 3**. Just two amphibian species were confirmed as being present on the Swanscombe Peninsula, smooth newt and marsh frog *Pelophylax ridibundus* a non-native species introduced to Kent in 1935. The marsh frog was not seen during the survey but its characteristic laughing calls were heard on the 17th and 25th May towards the north end of Swanscombe Marshes.

3.2.3 Smooth newts were recorded in D3, D4 and P5. 19 animals were recorded in total over the survey period with the peak count occurring on 17th May when 10 animals were recorded in D3 and 1 in D4.

3.2.4 In addition 6 adult newts and 2 efts only identifiable as smooth or palmate were recorded in D3, D4 and P5. Palmate and smooth newt larvae are indistinguishable in the field and adult females can only be distinguished by the degree of spotting on the throat, therefore need to be caught to be identified.

3.2.5 A tadpole was recorded in D4 on 30th April, likely to be that of the marsh frog as no other frog species was recorded during the survey. Fish were recorded in D4, D10, D11 and P5. These were mainly small, stickleback-like species.

3.2.6 A condition assessment of the water bodies is given in **Table 7.** The degree of vegetation cover and turbidity varied between water bodies and survey nights but most of the scores were low.

Table 2 Weather Conditions

Date	Cloud (%)	Rain	Start Time / Temperature (ºC)	End Time / Temperature (ºC)
30/04/12	50	0	20-45hrs / 15	23-40hrs / 14
17/05/12	70	0	20-55hrs / 18	23-50hrs / 17
25/05/12	100	0	21-10hrs / 15	23-40hrs / 15
15/06/12	80	0	21-20hrs / 14	23-30hrs / 13

Table 3 Survey Results – 30/04/12

Species	Ditch/Pond							
	D2	D4	D7	D10	D11	D12	P3	P4
Great crested newt	-	-	-	-	-	-	-	-
Smooth newt	-	1	-	-	-	-	-	-
Palmate newt	-	-	-	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-	-	-	-
Common frog	-	-	-	-	-	-	-	-
Common toad	-	-	-	-	-	-	-	-
Tadpole	-	1	-	-	-	-	-	-
Fish	-	-	-	Y	Y	-	-	-

Table 4 Survey Results – 17/05/12

Species	Ditch/Pond							
	D2	D3	D4	D7	D10	D11	P3	P5
Great crested newt	-	-	-	-	-	-	-	-
Smooth newt	-	10	1	-	-	-	-	-
Palmate newt	-	-	-	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-	-	-	1
Common frog	-	-	-	-	-	-	-	-
Common toad	-	-	-	-	-	-	-	-
Tadpole	-	-	-	-	-	-	-	-
Fish	-	-	-	-	Y	Y	-	Y

Table 5 Survey Results – 25/05/12

Species	Ditch/Pond				
	D3	D4	D10	D11	P5
Great crested newt	-	-	-	-	-
Smooth newt	-	-	-	-	1
Palmate newt	-	-	-	-	-
Smooth/palmate newt	4	1	-	-	-
Common frog	-	-	-	-	-
Common toad	-	-	-	-	-
Tadpole	-	-	-	-	-
Fish	-	-	Y	Y	Y

Table 6 Survey Results – 15/06/12

Species	Ditch/Pond				
	D3	D4	D5	D7	D9
Great crested newt	-	-	-	-	-
Smooth newt	6	-	-	-	-
Palmate newt	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-
Smooth/palmate newt eft	2	-	-	-	-
Common frog	-	-	-	-	-
Common toad	-	-	-	-	-
Tadpole	-	-	-	-	-
Fish	-	Y	-	-	-

Table 7 Water Body Condition Assessment

Water Body	Date	Turbidity Score	Vegetation Score
D2	30/04/12	0	1
	17/05/12	0	2
D3	17/05/12	1	1
	25/05/12	2	2
	15/06/12	0-1	1-2
D4	30/04/12	0	1
	17/05/12	1	2
	25/05/12	1	1
	15/06/12	0	1-2
D5	15/06/12	0	3
D7	30/04/12	0	1
	17/05/12	0	2
	15/06/12	0	2
D9	15/06/12	0	2
D10	30/04/12	3	1
	17/05/12	4	1
	25/05/12	4	2
D11	30/04/12	1-4	1-4
	17/05/12	1-4	1-4
	25/05/12	1-4	1-4
D12	30/04/12	1	3-4
P3	30/04/12	3	0
	17/05/12	3	1
P4	30/04/12	2	0
P5	17/05/12	0	1
	25/05/12	0-3	0-3

3.3 Habitat Suitability Index Scores

3.3.1 Habitat Suitability Index (HSI) scores were calculated for all the water bodies to aid evaluation of the ponds/ditches and their surrounding habitats for their suitability for great crested newts.

3.3.2 As shown in **Tables 8** and **9**, most of the water bodies on scored quite highly and the average score was 0.71 (a perfect great crested newt habitat would score 1). The reason for such high scores across the board is due to the large numbers of ditches and ponds within 1km of each other and large areas of suitable terrestrial habitat within a 500m radius.

3.3.3 Low scores were mainly influenced by poor water quality and high densities of fish, which meant that on average the ponds scored slightly lower than the ditches.

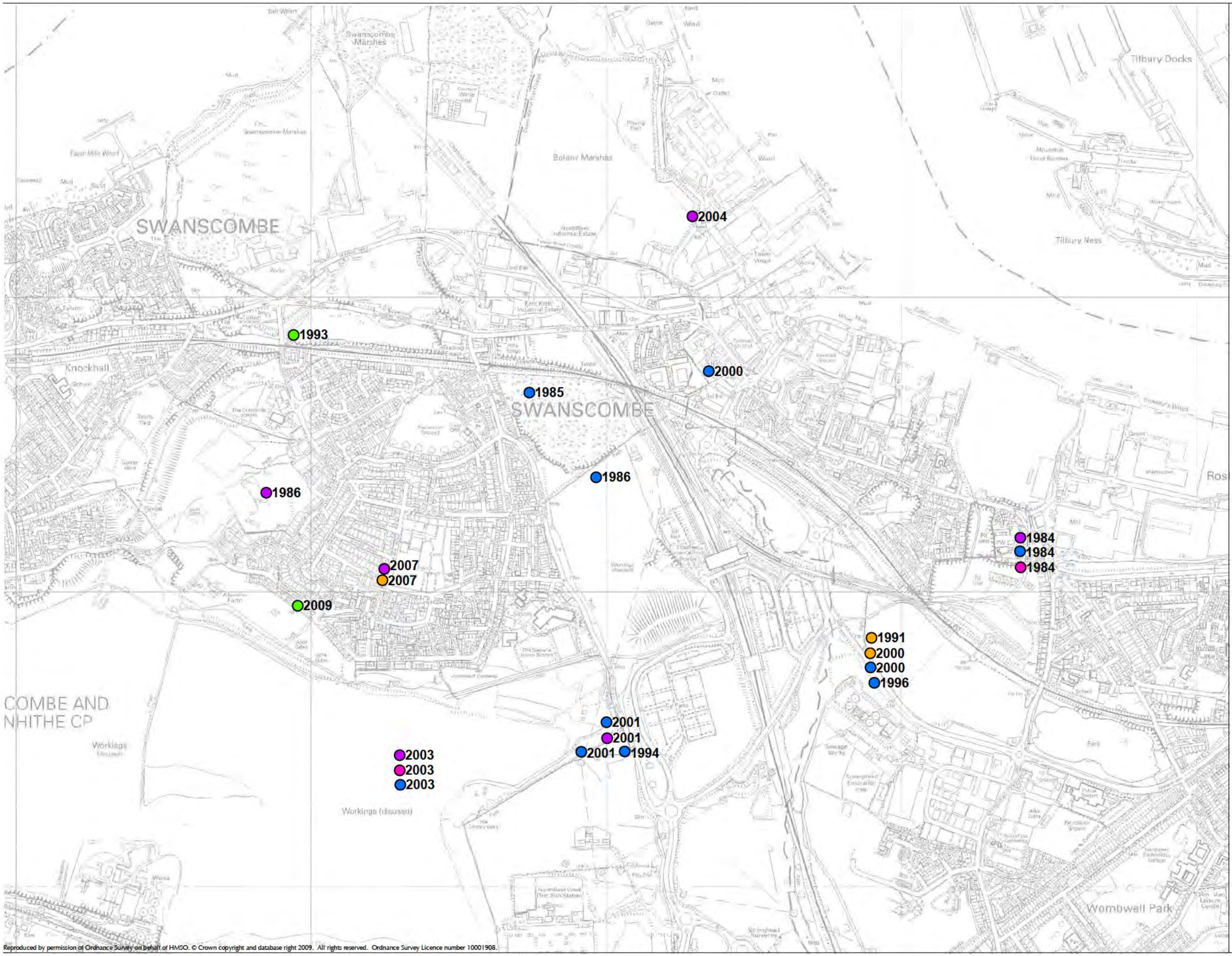
Table 8 HSI Scores for Ponds

Pond	1	2	3	4	5	6	7	8	9	10
Score	0.79	0.78	0.54	0.55	0.67	0.79	0.87	0.41	0.47	0.55

Table 9 HSI Scores for Ditches

Ditch	1	2	3	4	5	6	7	8	9	10	11	12	15	16
Score	0.81	0.86	0.86	0.74	0.85	0.86	0.87	0.79	0.79	0.81	0.55	0.57	0.77	0.58

FIGURES



KEY

Species

- Great crested newt
- Smooth newt
- Palmate newt
- Common toad
- Common frog

2000 Date of record

It should be noted that species locations are approximate - based on at least 6 figure grid references with an accuracy of 100m

0 200 400 m

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Amphibian Survey Report

N

FIGURE 1
Amphibian Records
(based on desk-top study data provided by KMBRC)

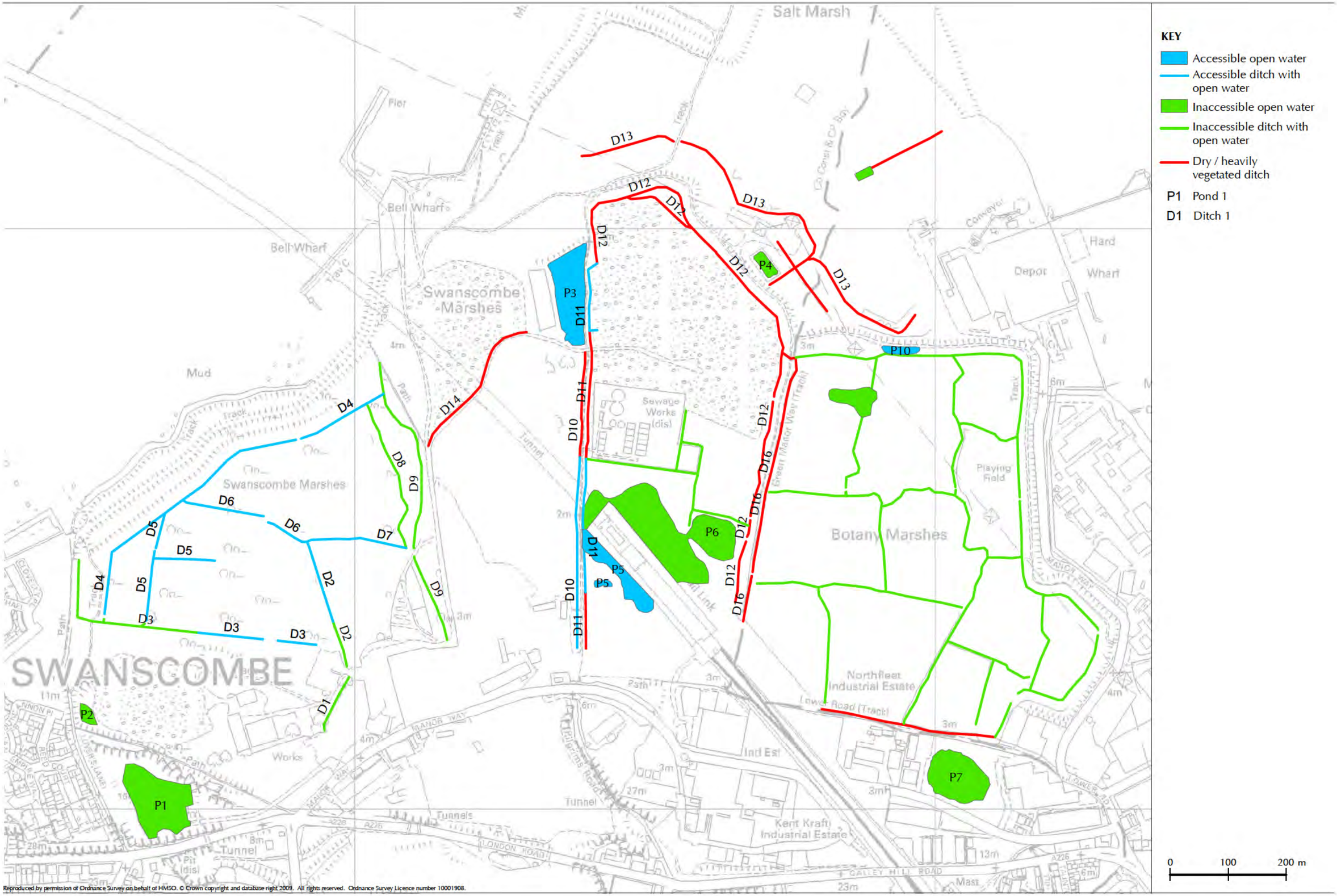

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FIGURE 2a

Location and Status of Water Bodies on Site

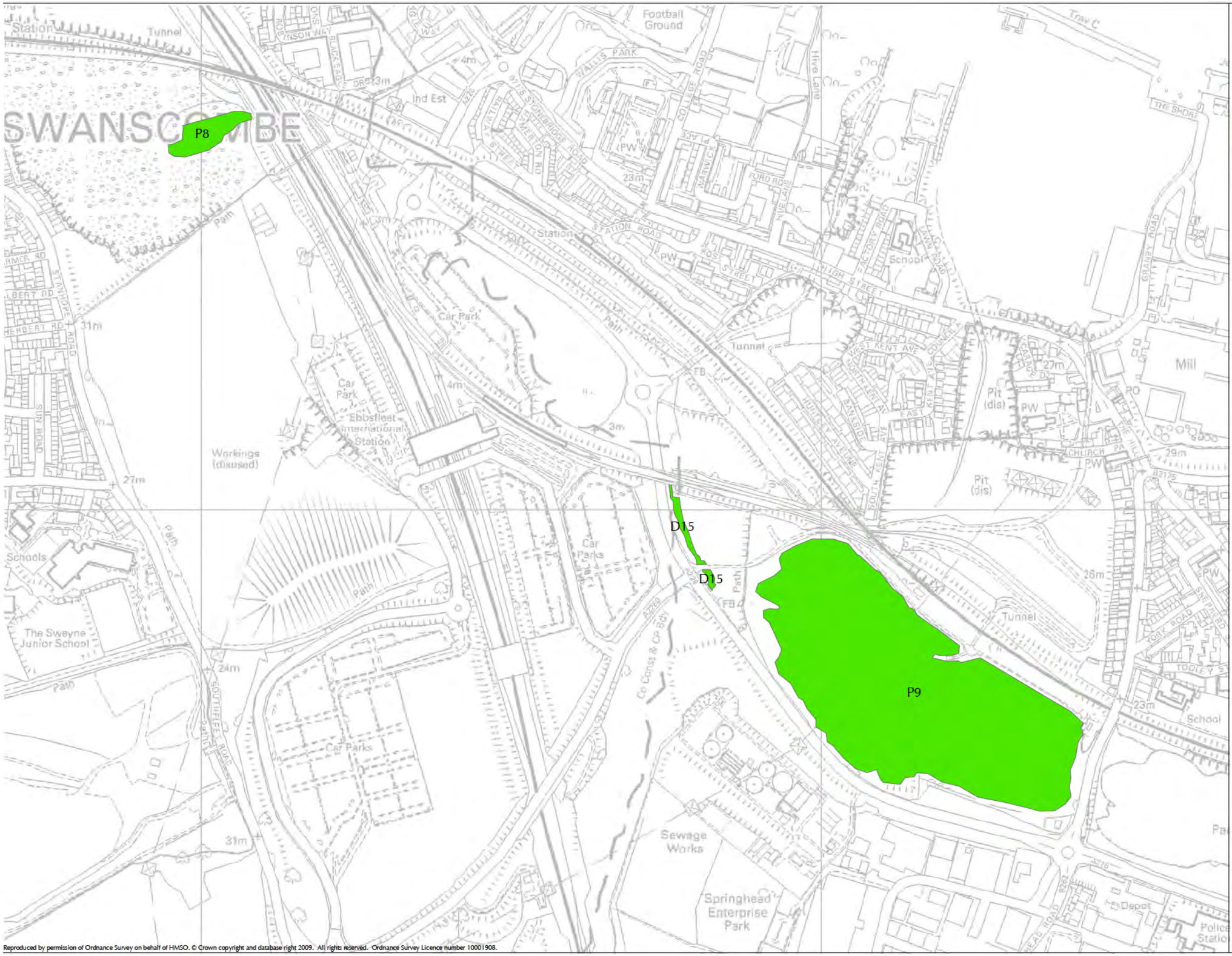

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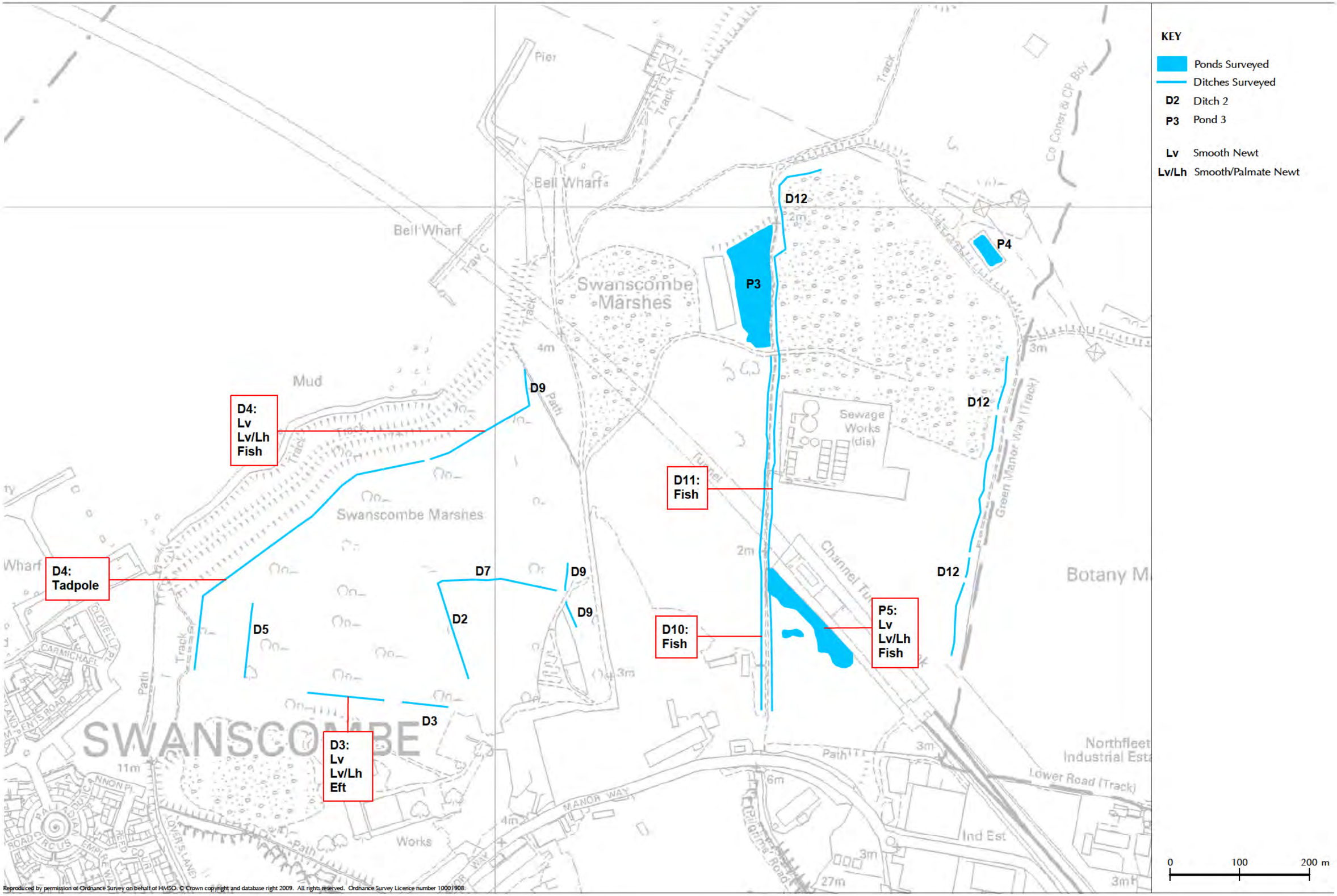
FIGURE 2b

Location and Status of Water Bodies on Site



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N

FIGURE 3
Amphibian Records made during the 2012 Survey

APPENDICES

APPENDIX A
Site Photographs

Figure A1 Lake with surrounding willow scrub and steep-sided woodland covered banks (P1)

Figure A2 Lake fringed with common reed. The water is discoloured red/brown in places- possibly due to leachate pollution (P3)

Figure A3 Pond with steep-sided bare soil banks. The water is discoloured red/brown- possibly due to leachate contamination (P4)

Figure A4 Shallow ponds surrounded by marshy grassland (P5)

Figure A5 Lake surrounded with swamp dominated by common reed (P6)

Figure A6 A typical ditch on Swanscombe marshes – 5m wide channel dominated by common reed on the banks and occasional bulrush (D7)

Figure A7 A ditch choked with common reed (D16)

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Annex EDP 25
2015 Amphibian Survey Report (CBA February 2016)

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London Resort Company Holdings (LRCH) Ltd.

London Paramount Entertainment Resort

2015 Amphibian Survey Report

DRAFT

February 2016

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London Resort Company Holdings (LRCH) Ltd.

London Paramount Entertainment Resort

2015 Harvest Mouse Survey Report

Approved	[redacted]
	Dominic Watkins
Position	Director
Date	15th February 2016
Revision	Draft

CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.1.2 The amphibian/great crested newt desk study and survey was undertaken by CBA. This report details the methodology, results and evaluation of the desk study as well as survey undertaken during June 2015.

1.2 Aims

1.2.1 The aims of the amphibian/great crested newt desk study and survey were to,

- Understand the distribution of records of amphibians in relation to the Proposed Development Area;
- identify whether great crested newts are present within the Proposed Development Area;
- evaluate any great crested newt populations present within the Proposed Development Area in relation to their nature conservation importance.

1.3 Previous Surveys

1.3.1 Amphibian surveys were carried out by CBA in 2012 of a number of ponds and ditches on the Swanscombe Peninsula[1]. These identified a probably small population of smooth newt and a population of marsh frogs. The survey report is included as **Appendix 1**.

1.4 Great Crested Newt Ecology

1.4.1 The great crested newt is the largest of the three British native newt species, reaching a maximum length of 14.5cm for males and 16cm for females. Great crested newts spend much of the year on land where they need a variety of different conditions to provide food, shelter and places to spend the winter. Like all amphibians, great crested newts rely on water for breeding and for the development of the larval stage and so return to ponds in the spring to breed. Eggs are laid singly on underwater leaves near the water margin between late February and early August, but usually between April and June, with each female laying several hundred

[1] Chris Blandford Associates for London Resort Company Holdings, 2012. London Paramount Amphibian Survey Report

eggs. The efts normally take three months to develop into young newts before leaving the water, but some may over-winter as efts. Juvenile newts disperse up to 1km, only returning to ponds to breed when sexually mature after one to three years. Adult newts leave the ponds from July onwards, generally staying within 200 – 500m of the ponds. From October or November, they hibernate in damp, frost-free environments, sometimes underground.

1.4.2 On land, great crested newts are found in cool, moist conditions under debris or in dense vegetation. They feed on both land and in water, eating small aquatic animals such as water fleas and insect larvae and terrestrial invertebrates, especially worms.

1.4.3 Despite the decline of this species in recent years, the great crested newt is still quite widespread in Great Britain and is numerous locally in parts of lowland England. Studies in the 1980's indicated a national rate of colony loss of approximately 2% over five years. The decline can be put down to loss of suitable breeding ponds caused by water table reduction, in-filling for development, changing farming practices, waste disposal, neglect or fish stocking and the degradation, loss and fragmentation of terrestrial habitats. The British population remains, however, among the largest in Europe and Britain therefore has an international responsibility for the species.

1.5 Legislation

1.5.1 All British amphibian species receive legal conservation protection in the United Kingdom, though the degree to which different species are protected varies.

1.5.2 The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was recently amended by the Countryside and Rights of Way (CRoW) Act 2000. The great crested newt is considered 'fully protected' as it is listed under Schedule 5 of the 1981 Act, and is therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a great crested newt [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a great crested newt [Section 9(2)];
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt [Section 9(4)(a)];
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose [Section 9(4)(b)];
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a great crested newt [section 9(5)].

1.5.3 The other more common amphibian species are protected against sale (Section 9(5)) only. In all cases, the legislation applies to all life stages including, eggs, efts (the larval stage), juveniles and adults.

1.5.4 The great crested newt is a UK Biodiversity Action Plan priority species and is considered sufficiently threatened in Europe to be included in the Habitats Directive and the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations'). The Habitats Regulations transpose into UK law Council Directive 92/43/EEC of the 21st May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats (and Species) Directive). The great crested newt is listed on Annex II and Annex IV (European protected species). Annex II relates to the designations of special areas of conservation (SACs) for this species (underlining their conservation significance even where they occur outside SACs). Annex IV requires member states to construct a system of protection as outlined in Article 12, this is done through inclusion on Schedule 2 of the Regulations. Regulation 39 makes it an offence to:

- Deliberately capture or kill a great crested newt [Regulation 39(1)(a)].
- Deliberately disturb a great crested newt [Regulation 39(1)(b)].
- Deliberately take or destroy the eggs of a great crested newt [regulation (1)(c].
- Damage or destroy a breeding site or resting place of a great crested newt [Regulation 39(1)(d)].

1.6 Key Findings

1.6.1 The 2012 survey and 2015 eDNA results suggest that no waterbodies within the Proposed Development Area are used for breeding by great crested newts. However, it is possible that populations recorded nearby may use terrestrial habitat within the Proposed Development Area, although the risk is considered to be low due to the presence of barriers to dispersal, such as roads and the CTRL.

1.6.2 There were incidental records of smooth newt and marsh frog from the Swanscombe Peninsula, smooth newt from Botany Marsh East and smooth newt and common toad from Bamber Pit.

2.0 METHODOLOGY

2.1 Desk Study

2.1.1 Desk-top study data, including records of amphibian species, for the proposed Development Area and a 2km buffer, was obtained from Kent and Medway Biological Records Centre (KMBRC) in January 2015.

2.1.2 The report of the 2012 survey of ditches and ponds on Swanscombe peninsula is noted above.

2.2 Survey

2.2.1 A number of ponds and ditches, described below, were surveyed across the Proposed Development Area and their locations are illustrated in **Figure 1**. On Swanscombe Peninsula the survey areas were selected to include all ponds considered potentially suitable and to provide good geographical coverage of the ditch network.

① Bamber Pit Pond - a relatively large pond located in the bottom of a disused chalk pit, Bamber Pit. The banks are steep and the water appears deep. It supports only small patches of aquatic, emergent or marginal vegetation and is set within a mosaic of unmanaged grassland, ruderal and scrub. There appears to be a large fish population, and is actively fished.

② Black Duck Marsh Ditch N – is a relatively wide (approx. 8m) ditch which runs along the northern edge of Black Duck Marsh. It is fringed on both sides by one to two metres of common reed *Phragmites australis* with approximately five metres of open water. Black Duck Marsh, comprising reedbed and open water, is to the south and to the north is managed and unmanaged grassland and an access road.

③ Black Duck Marsh Ditch E (N) – is a ditch which runs along the northern part of the eastern edge of Black Duck Marsh. It is largely set within dense scrub but patchy common reed is present along the ditch edges with approximately five metres of open water. There is reedbed and scrub to the west and unmanaged grassland, scrub and an access road to the east.

④ Black Duck Marsh Ditch E (S) – is a relatively wide (approx. 8m) ditch which runs along the southern part of the eastern edge of Black Duck Marsh. It is fringed with common reed on both sides with approximately five metres of open water. To the west is reedbed and to the east unmanaged grassland and scrub mosaic.

⑤ Swanscombe Centre – ditches and lagoon - comprises two ditches either side of a north-south access track and a lagoon at their northern end, all located in the centre of Swanscombe Peninsula. The ditches include dense common reed, especially in the eastern ditch, which has little open water, and the northern part of the western ditch. The southern section of the western ditch is more open, with 3-4m open water and patchy emergent and marginal

vegetation including reedmace *Typha* spp. and branched bur reed *Sparganium erectum* as well as common reed. The lagoon is relatively large with little or no aquatic vegetation but is fringed by common reed up to approximately ten metres wide. At the southern end especially there is a significant quantity of what appears to be cement kiln dust or similar material in the sediment. Both ditches and lagoon are all set within a mosaic of unmanaged grassland, dense and scattered scrub and reedbed.

⑥ CTRL Wetland N - comprises two ponds located within the wider CTRL wetland (largely reedbed) north of the CTRL compound. The southern pond is large. It is fringed by reed up to ten metres wide on the southern side. The northern side is more varied with rock armouring and stands of reedmace as well as a range of other species. Aquatic vegetation is abundant, with small pondweed *Potamogeton berchtoldii*, water starwort *Callitriche* sp. and brackish water-crowfoot *Ranunculus baudotii*. The northern pond is a smaller, roughly circular pond 30-40m in diameter and up to approx. 20cm in depth set within reedbed and with a fringe of sea club-rush. There is abundant aquatic vegetation comprising least pondweed *Potamogeton pusillus* and common stonewort *Chara vulgaris*.

⑦ CTRL Wetland S - is a pond located within the wider CTRL wetland (largely reedbed) south of the CTRL compound. It is fringed by reedbed and reedmace as well as some hard rush *Juncus effusus*. Aquatic vegetation includes least pondweed and common stonewort.

⑧ CTRL Wetland/Botany Marsh Ditches - comprises two ditches either side of a grassy access track between the CTRL Wetland (reedbed and open water) to the west and Botany Marshes (grazing marsh with ditches) to the east. Both are dominated by dense common reed with little or no open water.

⑨ Botany Marshes Ditch N - is a section of recently (winter 2014-15) de-silted ditch approximately three metres wide on the northern edge of Botany Marsh East. It is set within reedbed and scattered scrub but also adjoins the grazing marsh of Botany Marsh West and there is extensive unmanaged grassland to the north.

⑩ Botany Marshes Pond – is a new pond dug during winter 2014-15 on the eastern edge of Botany Marsh East. Much of it and the adjoining banks are bare of vegetation although there are small stands of common reed and reedmace and some brackish water-crowfoot. It is connected to a ditch running north and south along the eastern edge of Botany Marsh east and is set within a mosaic of grassland, reedbed and dense and scattered scrub.

⑳ Balancing Pond - lies within a wider mosaic of mostly unmanaged grassland and scrub. Open water comprises 80-90% of the pond, but there is some fringing common reed and reedmace and scattered willow scrub on the banks. The pond discharges into the Ebbsfleet to the east.

2.2.2 Two further waterbodies, labelled Ⓐ and Ⓑ in **Figure 1** are present on Swanscombe Peninsula but were not surveyed as they are currently operational leachate treatment lagoons and contain no vegetation little or no visible invertebrates.

Habitat Suitability Index (HSI)

2.2.3 A Habitat Suitability Index assessment (as developed by Oldham et al.[2]) for great crested newts was carried out for each pond and ditch surveyed (Figure 1). This methodology enables the ponds to be evaluated for their suitability for great crested newts, against a set of defined criteria. The calculation produces a score in the range 0 – 1, where the higher the score, the better the quality of habitat.

2.2.4 However, it should be borne in mind that the survey areas include a number of ditch sections on Swanscombe peninsula and the HSI methodology was developed for ponds, not ditches. This can cause difficulties, for example in calculating area, where ditch sections surveyed form part of a larger connected network, or when calculating the number of ponds within 1km. In all cases the ditch sections surveyed formed part of ditches greater than 2000m^2, so this feature was not included in the calculations. For the purposes of pond count each separate ditch section was considered as a pond. The assessment of water quality was based on the results of aquatic invertebrate surveys [TO BE REFERENCED IN THE FINAL REPORT] and that for fish was based in part on a fish survey [TO BE REFERENCED IN THE FINAL REPORT] of some of the waterbodies, as well as other observations. Both the aquatic invertebrate and fish surveys were carried out during 2015. Where survey areas include more than one waterbody and where these differ in character, for example ⑤ Swanscombe Centre – ditches and lagoon, they have been scored separately

2.2.5 In addition to the scoring, a system has been developed by the Amphibian and Reptile Groups of the UK[3] for using HSI scores to define pond suitability for great crested newts on a categorical scale, from poor to excellent, as shown in **Table 1**.

Table 1 Pond suitability for great crested newts based on HSI scores

HSI score	Pond suitability
< 0.5	poor
0.5-0.59	below average
0.6-0.69	average
0.7-0.79	good
> 0.8	excellent

[2] Oldham, R. S., Keeble, J., Swan, M. J. S. and Jefcote, M. (2000). Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10 pp143-155.
[3] Amphibian and Reptile Groups of the United Kingdom 2010. ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index

eDNA Survey

2.2.6 Environmental DNA is DNA that is released into the environment by organisms. In recent years a methodology for surveying for great crested newt DNA has been developed as a means of screening for presence or absence of this species within waterbodies during the breeding season. If great crested newt DNA is identified as present within a waterbody further surveys can be undertaken to determine population size class.

2.2.7 The methodology for collection and analysis of samples followed that developed by the Freshwater Habitats Trust[4]. Samples were collected from all ponds and ditches except the Balancing Pond on the 16th of June 2015 and analysed by ADAS.

2.2.8 Samples from three locations around the Balancing Pond were collected by Hyder Consulting (UK) Limited between 22nd-24th June 2015 and analysed by FERA using the same methodology. The results were made available to the project through a data sharing agreement.

[4] Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

3.0 RESULTS

3.1 Desk Study

3.1.1 KMBRC Desk Study data records for amphibians were more or less unchanged from those reported in the 2012 Amphibian Survey Report and as presented in **Figure 1** of that report.

3.1.2 Common frog, common toad, smooth newt, palmate newt and great crested newt have all been recorded from within the Proposed Development Area or nearby. The most significant records (2000 onwards) for great crested newt are from a railway tunnel ditch in Northfleet (2000), a roadside drain in the Ebbsfleet Valley (2000), a pond beside the Southfleet Road/B259 (2001) and from within Eastern Quarry (2002-03). Great crested newts were also recorded from the Bamber Pit area in 1985-86.

3.2 Habitat Suitability Index

3.2.1 HSI scores and pond suitability assessments are provided in **Table 2**. All the ditches and ponds on Swanscombe Peninsula are assessed as good or excellent for great crested newts. This is due in large part to the density of waterbodies on the peninsula. ⑳ Balancing Pond has a lower score, and is of average suitability, due largely to the absence of nearby ponds. Only ① Bamber Pit Pond is assessed as of poor suitability, due to a combination of high fish density, low macrophyte cover and the lack of ponds nearby. The full HSI calculations are provided in **Appendix 2**.

Table 2 Habitat Suitability Index scores (for great crested newt)

Survey Area	HSI score	Pond suitability
① Bamber Pit Pond	0.40	Poor
② Black Duck Marsh Ditch N	0.80	Excellent
③ Black Duck Marsh Ditch E (N)	0.73	Good
④ Black Duck Marsh Ditch E (S)	0.80	Excellent
⑤ Swanscombe Centre - ditches	0.85	Excellent
⑤ Swanscombe Centre - lagoon	0.77	Good
⑥ CTRL Wetland N (N)	0.95	Excellent
⑥ CTRL Wetland N (S)	0.94	Excellent
⑦ CTRL Wetland S	0.95	Excellent
⑧ CTRL Wetland/Botany Marsh Ditches	0.84	Excellent
⑨ Botany Marshes Ditch N	0.74	Good
⑩ Botany Marshes Pond	0.88	Excellent
⑳ Balancing Pond	0.68	Average

3.3 eDNA Survey

3.3.1 All samples returned a negative result for the presence of great crested newt DNA except two, those for survey areas ⑧ CTRL Wetland/Botany Marsh Ditches and ⑨ Botany Marshes Ditch N, which returned undetermined results due to the unavoidable presence of silt in the samples. The full laboratory report is available in **Appendix 3**.

3.3.2 Due to the negative results no further surveys were undertaken.

3.4 Incidental records

3.4.1 There were single records of smooth newt from near the centre of Swanscombe Peninsula and of smooth newt and common toad in Bamber Pit from under roofing felt heat traps during the reptile survey. Smooth newts were also observed in ditches in Botany Marsh East and marsh frogs were heard calling in Black Duck Marsh on a number of occasions.

4.0 CONCLUSIONS

4.1 Amphibians

4.1.1 The desk study and survey results indicate that the Swanscombe Peninsula supports a probably small population of smooth newts and a population of marsh frogs, that Botany Marsh East supports smooth newts and Bamber Pit supports populations of smooth newt and common toad.

4.2 Great Crested Newts

4.2.1 Based on the negative 2012 survey and 2015 eDNA results it is considered very unlikely that great crested newts use any waterbodies within the Proposed Development Area for breeding. Although two of the eDNA results were undetermined, given the context of these among otherwise negative results across the Swanscombe Peninsula it is considered very unlikely these samples would have returned positive results in the absence of silt contamination.

4.2.2 Given historical records for the presence of great crested newts from within 500m of the Proposed Development Area, and the availability of suitable terrestrial habitat, it is possible that great crested newts may use parts of the Proposed Development Area during their terrestrial phase. However, due to the presence of barriers to dispersal, e.g. built development, major road networks, the Ebbsfleet corridor and the CTRL, between the location of records and habitat within the Proposed Development Area, it is considered this is a very low risk.

FIGURES

1 Survey Areas

A Other Water Features

0 150 300 Metres

N

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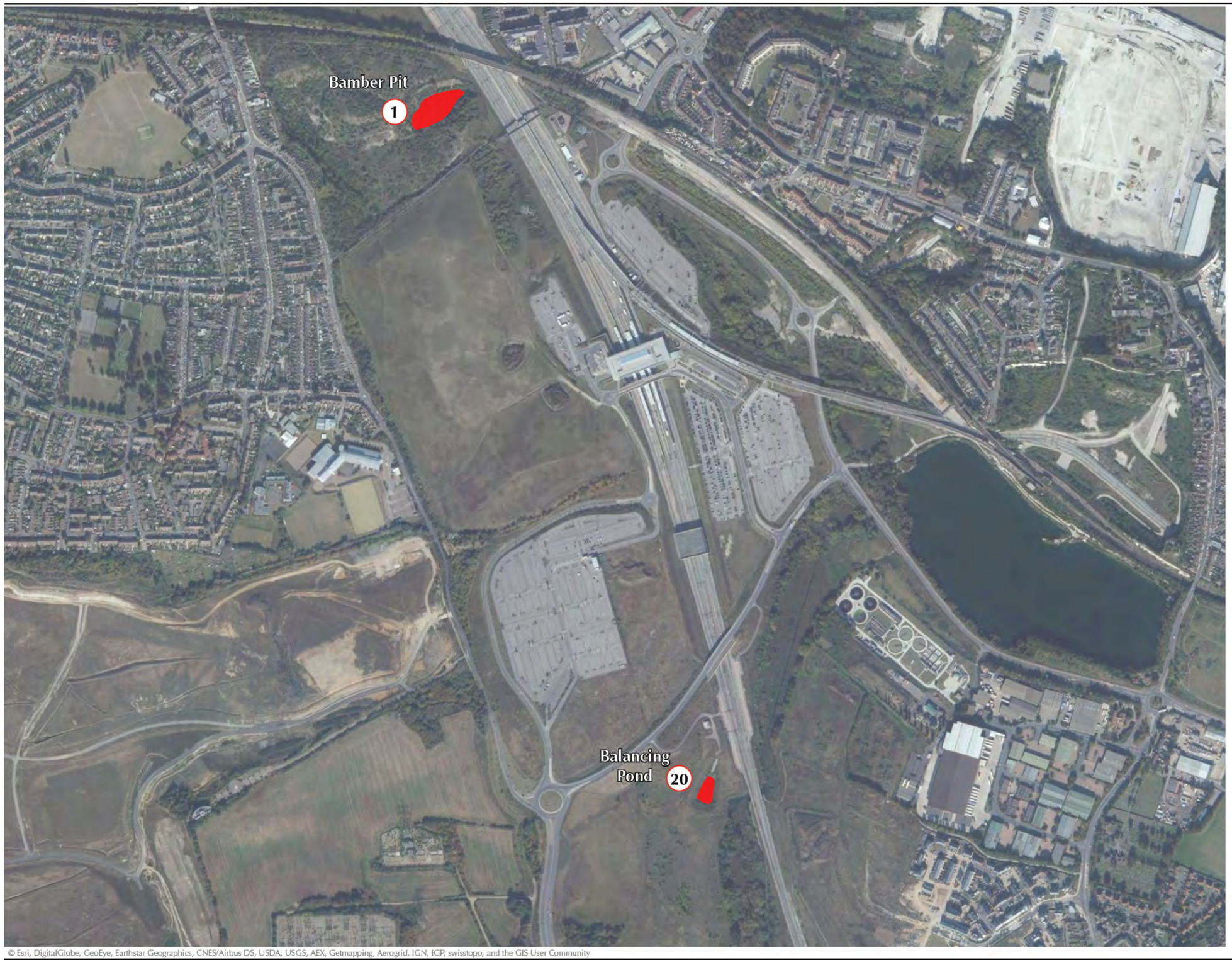
11120201_Amphibians_11-02-16.indd

AMPHIBIAN - GREAT CRESTED NEWT - SURVEY
LONDON PARAMOUNT ENTERTAINMENT RESORT
LONDON RESORT COMPANY HOLDINGS

FIGURE 1a
GREAT CRESTED NEWT
eDNA SAMPLE SITE LOCATIONS



1 Survey Areas

A Other Water Features

0 150 300 Metres

N

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AMPHIBIAN - GREAT CRESTED NEWT - SURVEY
LONDON PARAMOUNT ENTERTAINMENT RESORT
LONDON RESORT COMPANY HOLDINGS

FIGURE 1b
GREAT CRESTED NEWT
eDNA SAMPLE SITE LOCATIONS

February 2016
11120201_Amphibians_11-02-16.indd

APPENDICES

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cba

London Resort Company Holdings (LRCH) Ltd.

London Paramount

2012 Amphibian Survey Report

November 2012

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London Resort Company Holdings (LRCH) Ltd.

London Paramount

2012 Amphibian Survey Report

Approved	[redacted]
	Bill Wadsworth
Position	Senior Associate (Ecology)
Date	30th November 2012
Revision	Final

CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings (LRCH) Ltd. to undertake a series of ecological surveys to inform the Environmental Impact Assessment for the proposed London Paramount development at Swanscombe, North Kent.

1.1.2 This report details the results of the amphibian survey undertaken between April and June 2012.

1.2 Scope

1.2.1 The scope of the survey was to determine:

- habitat suitability assessments for all waterbodies within the proposed development area that have the potential to support amphibians; and
- the presence and status of amphibians using a series of ponds and ditches, with specific reference to great crested newts *Triturus cristatus* (a species considered fully protected by law).

Survey Limitations

1.2.2 Most of the waterbodies consisted of steep-sided, deep water, lagoons, ditches and drains, many of which contained significant deposits of silt. The waterbodies were too deep for surveyors to safely wade in and be able to set traps effectively and therefore for both health and safety and practical reasons, it was not possible to deploy bottle trapping as a survey technique.

1.2.3 Additionally, some waterbodies within 500m of the proposed development area were not surveyed due to access restrictions.

1.3 Key Findings

Great Crested Newts

1.3.1 The results of the amphibian survey suggest that great crested newts are not present in any of the surveyed water bodies on the Swanscombe peninsula north of the A226. No signs of this species were recorded during the survey in 2012 and the desk-top study revealed no historical records either. The HSI scores suggest that most of the water bodies on the peninsula are highly

suitable habitats so it may be that the A226 as a busy main road has proved to be an effective barrier preventing colonisation of this area.

1.3.2 Further survey work may be required to establish whether or not great crested newts are present elsewhere within the proposed development area, but for which access has not yet been possible. The lake in Bamber pit where great crested newts were recorded in 1985 scored just 0.41 on the HSI due to the high densities of fish. It may be that the fish were introduced to the lake since the record was made as it now seems highly unlikely great crested newts are found in this area.

Other Amphibian Species

1.3.3 The results of the survey suggest that a small population of smooth newts and an unknown population of marsh frogs are found on the Swanscombe peninsula, mainly concentrated around Swanscombe Marshes.

2.0 METHODOLOGY

2.1 Background

2.1.1 There are six native species of amphibian in the UK of which five, common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus*, and great crested newt could be expected to occur within the proposed development area. The sixth, natterjack toad *Bufo calamita*, is very restricted in its distribution and does not occur within or near to the proposed development area.

2.2 Great Crested Newt Ecology

2.2.1 The great crested newt is the largest of the three British native newt species, reaching a maximum length of 14.5cm for males and 16cm for females. Great crested newts spend much of the year on land where they need a variety of different conditions to provide food, shelter and places to spend the winter. Like all amphibians, great crested newts rely on water for breeding and for the development of the larval stage and so return to ponds in the spring to breed. Eggs are laid singly on underwater leaves near the water margin between late February and early August, but usually between April and June, with each female laying several hundred eggs. The efts normally take three months to develop into young newts before leaving the water, but some may over-winter as efts. Juvenile newts disperse up to 1km, only returning to ponds to breed when sexually mature after one to three years. Adult newts leave the ponds from July onwards, generally staying within 200 – 500m of the ponds. From October or November, they hibernate in damp, frost-free environments, sometimes underground.

2.2.2 On land, great crested newts are found in cool, moist conditions under debris or in dense vegetation. They feed on both land and in water, eating small aquatic animals such as water fleas and insect larvae and terrestrial invertebrates, especially worms.

2.2.3 Despite the decline of this species in recent years, the great crested newt is still quite widespread in Great Britain and is numerous locally in parts of lowland England. Studies in the 1980's indicated a national rate of colony loss of approximately 2% over five years. The decline can be put down to loss of suitable breeding ponds caused by water table reduction, in-filling for development, changing farming practices, waste disposal, neglect or fish stocking and the degradation, loss and fragmentation of terrestrial habitats. The British population remains, however, among the largest in Europe and Britain therefore has an international responsibility for the species.

2.3 Legislation

2.3.1 All British amphibian species receive legal conservation protection in the United Kingdom, though the degree to which different species are protected varies.

2.3.2 The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was recently amended by the Countryside and Rights of Way (CRoW) Act 2000. The great crested newt is considered 'fully protected' as it is listed under Schedule 5 of the 1981 Act, and is therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a great crested newt [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a great crested newt [Section 9(2)];
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt [Section 9(4)(a)];
- Intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose [Section 9(4)(b)];
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a great crested newt [section 9(5)].

2.3.3 The other more common amphibian species are protected against sale (Section 9(5)) only. In all cases, the legislation applies to all life stages including, eggs, efts (the larval stage), juveniles and adults.

2.3.4 The great crested newt is a UK Biodiversity Action Plan priority species and is considered sufficiently threatened in Europe to be included in the Habitats Directive and the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations'). The Habitats Regulations transpose into UK law Council Directive 92/43/EEC of the 21st May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats (and Species) Directive). The great crested newt is listed on Annex II and Annex IV (European protected species). Annex II relates to the designations of special areas of conservation (SACs) for this species (underlining their conservation significance even where they occur outside SACs). Annex IV requires member states to construct a system of protection as outlined in Article 12, this is done through inclusion on Schedule 2 of the Regulations. Regulation 39 makes it an offence to:

- Deliberately capture or kill a great crested newt [Regulation 39(1)(a)].
- Deliberately disturb a great crested newt [Regulation 39(1)(b)].
- Deliberately take or destroy the eggs of a great crested newt [regulation (1)(c].
- Damage or destroy a breeding site or resting place of a great crested newt [Regulation 39(1)(d)].

2.4 Scope of Survey

2.4.1 The requirement to undertake an amphibian survey results from the protected status of the great crested newt and its possible presence within the development area, identified during the desk-top study and Phase 1 habitat survey carried out in April-May 2012. The main body of the proposed development area (north of the A226) supports a large network of ditches and 8 lakes/ponds. In addition there are two large lakes in former quarries located south of the A226. The water bodies north of the A226 are linked by a mosaic of terrestrial habitats of varying quality for supporting amphibians, whilst the lakes south of the A226 appear to be isolated.

2.4.2 The results of the desk-top study, showing the locations of amphibian records in and around Swanscombe are displayed in **Figure 1.** Only species records provided by Kent and Medway Biological Records Centre (KMBRC) with an accurate grid reference of at least 6 figures (100m square) are displayed. This left just relatively few amphibian records in the Swanscombe area, with a distinct lack of records on the peninsula north of the A226.

2.4.3 The results of the Phase 1 habitat survey suggest that overall there is a large amount of suitable habitat for amphibians on the peninsula which is mainly comprised of rough grassland and scrub, and with small areas of broadleaved woodland. Most of this habitat is continuous and links to a number of ditches and ponds. South of the A226 the largest continuous blocks of suitable habitat are present in Bamber pit and surrounding locations in Ebbsfleet valley where areas of rough grassland, scrub and woodland are present.

2.5 Survey Methodology

2.5.1 Within the main body of the proposed development area (north of the A226) the following water bodies were surveyed for amphibians:

- the network of drainage ditches on Swanscombe Marshes (D2-D5, D7 & D9)
- the drainage ditches to the east and west of the Channel Tunnel Rail Link (HS1) and old sewage works (D10-D12)
- the pond situated north-west of the old sewage works (P3)
- the pond situated north-east of the old sewage works (P4)
- the ponds south of the HS1 (P5)

2.5.2 The remaining water bodies were deemed unsuitable for great crested newts (mainly due to being choked with reed), too dangerous to access or permission had not been given to access the land on which they are situated. The locations of all the water bodies surveyed are set out in **Figure 2** and descriptions of each are provided below.

2.5.3 Surveys were conducted on 4 separate occasions from 30th April to 15th June 2012 between the hours of 20:30 and 23:30. Torchlight surveys and egg searches were the principal survey techniques used. Bottle trapping was not used as a technique due to the difficulty of accessing steep sided ditches, containing in excess of 1m depth water and deep deposits of silt. On each night of survey the water bodies were given a vegetation and turbidity score between 0 and 5. A vegetation score of 0 indicating a water body clear of vegetation and 5 completely choked. A turbidity score of 0 indicating a clear water body and 5 extremely murky.

2.5.4 The surveys were carried out in suitable weather conditions, according to guidance provided by the Herpetofauna Groups of Britain and Ireland (HGBI)[1] and Froglife[2]. Torching was undertaken shortly after dusk on still, warm evenings above 5ºC with the aid of a 1 million candle power torch. Full details of the weather conditions during the surveys are given in **Table 2.**

2.5.5 The surveys were specifically aimed at detecting great crested newts in their various life stages, but also included surveys for other amphibians and incidental fish records, particularly as fish can have a determining influence on the presence of great crested newts.

2.5.6 Smooth and palmate newts can be difficult to distinguish in the field using torchlight searches so where the species was uncertain the record was made as smooth/palmate newt.

2.6 Evaluation Methodology

2.6.1 In order to assess the importance of the ponds in relation to their amphibian assemblages the population size class assessment set out in Section 5.8.3 of the English Nature guidelines[3] was used. The purpose for using this assessment is to recognise the inherent difficulty and range of factors that can affect the determination of the size of a given population. As EN's guidelines state "… surveys may reveal from around 2% to 30% of the population … recent evidence has revealed even greater variation". EN therefore recommends the use of the following size classifications as a minimum for interpreting survey results. The size classifications are set out in **Table 1** below.

Table 1 Great Crested Newt Population Size Class Assessment

Species	Low/Small Population	Good/Medium Population	Exceptional/Large
Great crested newt	<10	11-100	>100

[1] HGBI (1998) *Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards.* HGBI Advisory Notes (ARGs). HGBI, c/o Froglife, Halesworth, Unpubl.
[2] Froglife (2003) *Advice Sheet 11 – Surveying for (Great Crested) Newt Conservation.* Froglife, Halesworth.
[3] English Nature (2001) *Great Crested Newt Mitigation Guidelines.*

2.6.2 The results of the surveys can be further supported using data relating to the quality of the pond and surrounding terrestrial habitat. This is known as the Habitat Suitability Index (HSI), or Oldham Criteria, after the paper's author (Oldham *et al*, 2000[4]). This methodology enables the ponds to be evaluated for their suitability for great crested newts, against a set of defined criteria. The calculation produces a figure in the range 0 – 1, where the closer the figure tends towards 1, the better the quality of habitat.

[4] Oldham, R. S., Keeble, J., Swan, M. J. S. and Jefcote, M. (2000). *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus)*. Herpetological Journal **10** pp143-155.

3.0 RESULTS

3.1 Water Body Descriptions

Ditch Descriptions

3.1.1 The ditches surveyed have been labelled D (Ditch) 1 to D16 respectively and are shown in **Figure 2**.

3.1.2 **D1:** This is a short section of ditch in the south-west corner of the survey area. It has approximately 100m long and 5m wide with very steep sides and shallow water that drains into a culvert. It is mainly shaded by scrub and has hard standing on the banks.

3.1.3 **D2:** This ditch is sandwiched between the edge of Swanscombe Marshes and an area of rough grassland with scattered scrub. The ditch itself is approximately 200m long and 5m wide with open water in the channel to a depth of 0.5m. The west margin is fringed by common reed and to the east there is bracken *Pteridium aquilinum* and bramble *Rubus fruticosus* scrub.

3.1.4 **D3:** This ditch runs along the northern boundary of some broadleaved woodland in the south-west corner of the survey area. It is approximately 500m long, 6m wide and 0.5m deep. The southern margin is overhung by trees leaving the water quite shaded and the eastern boundary is heavily scrubbed with bramble along much of its length. To the north of the ditch is Swanscombe Marshes.

3.1.5 **D4-D7:** These ditches dividing Swanscombe Marshes are all quite similar in character. Typically they are 6m wide with common reed *Phragmites australis* dominating the bank and channel vegetation. There is little other vegetation besides the occasional patches of reedmace *Typha latifolia*. Water depth in the channels is variable but in most there are quite large areas of open water. The approximate lengths of the ditches are as follows:

- D4 – 650m
- D5 – 300m
- D6 – 200m
- D7 – 150m

3.1.6 **D8-D9:** These ditches are situated at the east of Swanscombe Marshes and are mostly inaccessible as they are surrounded by dense scrub. D8 is approximately 250m long and D9 500m. Both look to be approximately 6m wide with open water up to 1m deep.

3.1.7 **D10:** This ditch runs along the eastern boundary of a landfill and is bordered on the west by dense hawthorn *Crataegus monogyna* and willow *Salix spp.* scrub that grades into a narrow woodland belt. On the eastern boundary there is a fringe of common reed and some emergent reedmace. It is steep-sided, approximately 500m long, 5m wide and with standing water in the channel at variable depth. Moving south to north the water drops from around 0.5m to a negligible depth where vegetation chokes the channel. Numerous fish were observed in the ditch, possibly sticklebacks.

3.1.8 **D11:** This ditch runs opposite to D10 bordering P5, the old sewage works and another landfill. It is approximately 750m long and 5m wide with varying water depth along its length. In three locations it opens up into small pools of water approximately 0.5m deep but along most of its length the channel is quite heavily vegetated with common reed and reedmace and there are no areas of open water. In the pools numerous fish were observed, again possibly sticklebacks. At the north end there is a section of ditch that looks to have recently been dredged, allowing shallow water to flow into a culvert.

3.1.9 **D12:** This ditch runs along the northern margin of a landfill and to the east of a large area of swamp. It is approximately 900m long, 5m wide and has very shallow (5cm) or no standing water along much of its length. The channel has become totally choked with common reed and it looks soon to dry up completely.

3.1.10 **D13:** This is a French drain that runs along the southern boundary of a planted shelterbelt and then appears to feed P4. It is approximately 1000m long, 2m wide and up to 1m deep. For much of its length a gravel bottom can be seen.

3.1.11 **D14:** This is a dry ditch bordering the southern margin of a large area of ephemeral/short perennial vegetation central to the survey area. It is approximately 200m long, 1m wide and 0.5m deep. It does not appear to ever collect water.

3.1.12 **D15:** This ditch is a part of the River Ebbsfleet that opens up next to the A226 at the southern end of the survey area. It is approximately 150m long, 5m wide and has standing water around 0.5m deep. The ditch is mainly surrounded by dense scrub and an area of swamp to the east and the main road borders the western side. In terms of the wider landscape the ditch is in a highly fragmented habitat with a large lake (P9), main roads and urban development all in close proximity.

3.1.13 **D16:** This ditch runs parallel to D16 and is very similar in character. It is approximately 400m long, 3m wide and up to 1m deep. There is little or no standing water along much of its length, the channel is choked with common reed and it looks soon to dry up completely. In terms of

the wider landscape this ditch borders the western margin of Botany Marshes, a large area of cattle-grazed grassland.

Lake/Pond Descriptions

3.1.14 The lakes and ponds surveyed have been labelled P (Pond) 1 to P10 respectively and are shown in **Figure 2**.

3.1.15 **P1:** This lake is situated immediately north of the A226 in the south-west corner of the survey area that has developed in an old quarry. It is approximately 9500m^2 in size with a perimeter of around 450m and unknown depth. It is surrounded by very steep sides covered by woodland and dense willow scrub and was deemed inaccessible and dangerous to survey. There is little apparent aquatic vegetation except for the occasional clumps of hard rush *Juncus inflexus*. Waterfowl were observed using this lake during the Phase 1 habitat surveys carried out by CBA. In terms of the wider landscape the lake is bordered by rough grassland and woodland to the north and east, a main road to the south and urban development to the west.

3.1.16 **P2:** This pond is situated at the bottom of a very steep sided valley in the north-west corner of the survey area. It is too dangerous to access but appears to be approximately 700m^2 in size with a perimeter of around 100m. Woodland and scrub line the banks and there is a lot of rubbish strewn down the sides and in the water at the bottom. Much of the pond looked to be shaded by the trees. In terms of the wider landscape there are large areas of woodland, rough grassland and scrub to the east and urban development to the west.

3.1.17 **P3:** This lake is situated between two former landfills at the north end of the survey area. It is roughly rectangular in shape, 7500m^2 in size and has a 425m perimeter. Most of this perimeter is fringed by common reed and there is a strip of broadleaved woodland on the western banks. There is little to no aquatic vegetation visible and the water was discoloured red/brown, possibly contaminated by landfill leachate. Waterfowl have been observed using this water body. In terms of the wider landscape it is surrounded by extensive areas of rough grassland, scrub, ditches and woodland.

3.1.18 **P4:** This pond is situated to the north-west of Botany Marshes and looks like it was recently created or modified. It is quite uniformly rectangular, approximately 900m^2 in size with a 125m perimeter. The banks are steep with bare soil and the water quality looks very poor. It is red/brown in colour, possibly contaminated with landfill leachate and there is little/no aquatic vegetation or invertebrates to be seen. In terms of the wider landscape this pond is surrounded by extensive areas of rough grassland, scrub and ditches.

3.1.19 **P5:** This is a series of shallow ponds situated immediately south of the HS1. They are rapidly becoming vegetated over by common reed and reedmace and the open water remaining probably exceeds no more than 2000m^2 in extent. The average depth of water in the pools is no more than 0.1m. The ponds grade into marshy grassland to the south with hard rush, creeping bent *Agrostis stolonifera* and great willowherb *Epilobium hirsutum*. Waterfowl and small fish, possibly sticklebacks, have been observed using these water bodies. In terms of the wider landscape the ponds are surrounded by large areas of ephemeral/short perennial vegetation, scrub, ditches and rough grassland. The HS1 presents a potential barrier to the north.

3.1.20 **P6:** This lake is situated between the HS1 and old sewage works. It appears to be man-made and covers a large area approximately 14000m^2 in size with a 950m perimeter. The extent of open water looks to be much less than this as the lake is surrounded by a very large swamp and common reed is encroaching. Several species of waterfowl have been observed on the lake including tufted duck *Aythya fuligula* and mute swan *Cygnus olor*. In terms of the wider landscape this lake is mainly surrounded by swamp, the cattle-grazed fields of Botany Marshes are to the east and the HS1 is situated to the south.

3.1.21 **P7:** This pond is situated just north of the A226 within an industrial estate. It is roughly circular in shape, 7000m^2 in size and has a 300m perimeter. The surrounding banks looked to have been recently disturbed and were characterised by ruderal vegetation. Waterfowl were observed using this pond during the Phase 1 habitat survey. In terms of the wider landscape only the northern boundary of the pond features suitable terrestrial habitat for amphibians where large areas of rough grassland and scrub can be found.

3.1.22 **P8:** This lake is situated at the base of a large former quarry pit just south of the A226. It is approximately 5000m^2 in size with a 350m perimeter and unknown depth. The steep sides are covered with dense scrub and mature trees. Large fish, possibly carp, were observed in the water. The quarry within which the lake is situated is approximately 11ha and comprises a complex mosaic of short and tall grassland, scrub, and birch woodland.

3.1.23 **P9:** This very large lake fills the bottom of an old quarry pit east of the A226 in the south-east corner of the survey area. It is over 100,000m^2 in size with a perimeter of approximately 1500m. It is surrounded by very steep chalk escarpments with dense scrub and in terms of the wider landscape it is mostly enclosed by main roads, the HS1 and urban development.

3.1.24 **P10:** This is a small, shallow pool of water that extends from the ditches on Botany Marshes. It is no more than 750m^2 in size with a 150m perimeter and is heavily vegetated with reed. The water is likely to dry up during seasons with little rainfall. There is little to no aquatic

vegetation visible and the water was discoloured red/brown, possibly contaminated by landfill leachate. In terms of the wider landscape the pond is surrounded by large areas of rough grassland.

3.2 Survey Results

3.2.1 Weather conditions during the survey are summarised in **Table 2**. Every evening was dry and warm with a varying degree of cloud cover.

3.2.2 The full results of the survey are given in **Tables 3-6** and shown in **Figure 3**. Just two amphibian species were confirmed as being present on the Swanscombe Peninsula, smooth newt and marsh frog *Pelophylax ridibundus* a non-native species introduced to Kent in 1935. The marsh frog was not seen during the survey but its characteristic laughing calls were heard on the 17th and 25th May towards the north end of Swanscombe Marshes.

3.2.3 Smooth newts were recorded in D3, D4 and P5. 19 animals were recorded in total over the survey period with the peak count occurring on 17th May when 10 animals were recorded in D3 and 1 in D4.

3.2.4 In addition 6 adult newts and 2 efts only identifiable as smooth or palmate were recorded in D3, D4 and P5. Palmate and smooth newt larvae are indistinguishable in the field and adult females can only be distinguished by the degree of spotting on the throat, therefore need to be caught to be identified.

3.2.5 A tadpole was recorded in D4 on 30th April, likely to be that of the marsh frog as no other frog species was recorded during the survey. Fish were recorded in D4, D10, D11 and P5. These were mainly small, stickleback-like species.

3.2.6 A condition assessment of the water bodies is given in **Table 7.** The degree of vegetation cover and turbidity varied between water bodies and survey nights but most of the scores were low.

Table 2 Weather Conditions

Date	Cloud (%)	Rain	Start Time / Temperature (ºC)	End Time / Temperature (ºC)
30/04/12	50	0	20-45hrs / 15	23-40hrs / 14
17/05/12	70	0	20-55hrs / 18	23-50hrs / 17
25/05/12	100	0	21-10hrs / 15	23-40hrs / 15
15/06/12	80	0	21-20hrs / 14	23-30hrs / 13

Table 3 Survey Results – 30/04/12

Species	Ditch/Pond							
	D2	D4	D7	D10	D11	D12	P3	P4
Great crested newt	-	-	-	-	-	-	-	-
Smooth newt	-	1	-	-	-	-	-	-
Palmate newt	-	-	-	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-	-	-	-
Common frog	-	-	-	-	-	-	-	-
Common toad	-	-	-	-	-	-	-	-
Tadpole	-	1	-	-	-	-	-	-
Fish	-	-	-	Y	Y	-	-	-

Table 4 Survey Results – 17/05/12

Species	Ditch/Pond							
	D2	D3	D4	D7	D10	D11	P3	P5
Great crested newt	-	-	-	-	-	-	-	-
Smooth newt	-	10	1	-	-	-	-	-
Palmate newt	-	-	-	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-	-	-	1
Common frog	-	-	-	-	-	-	-	-
Common toad	-	-	-	-	-	-	-	-
Tadpole	-	-	-	-	-	-	-	-
Fish	-	-	-	-	Y	Y	-	Y

Table 5 Survey Results – 25/05/12

Species	Ditch/Pond				
	D3	D4	D10	D11	P5
Great crested newt	-	-	-	-	-
Smooth newt	-	-	-	-	1
Palmate newt	-	-	-	-	-
Smooth/palmate newt	4	1	-	-	-
Common frog	-	-	-	-	-
Common toad	-	-	-	-	-
Tadpole	-	-	-	-	-
Fish	-	-	Y	Y	Y

Table 6 Survey Results – 15/06/12

Species	Ditch/Pond				
	D3	D4	D5	D7	D9
Great crested newt	-	-	-	-	-
Smooth newt	6	-	-	-	-
Palmate newt	-	-	-	-	-
Smooth/palmate newt	-	-	-	-	-
Smooth/palmate newt eft	2	-	-	-	-
Common frog	-	-	-	-	-
Common toad	-	-	-	-	-
Tadpole	-	-	-	-	-
Fish	-	Y	-	-	-

Table 7 Water Body Condition Assessment

Water Body	Date	Turbidity Score	Vegetation Score
D2	30/04/12	0	1
	17/05/12	0	2
D3	17/05/12	1	1
	25/05/12	2	2
	15/06/12	0-1	1-2
D4	30/04/12	0	1
	17/05/12	1	2
	25/05/12	1	1
	15/06/12	0	1-2
D5	15/06/12	0	3
D7	30/04/12	0	1
	17/05/12	0	2
	15/06/12	0	2
D9	15/06/12	0	2
D10	30/04/12	3	1
	17/05/12	4	1
	25/05/12	4	2
D11	30/04/12	1-4	1-4
	17/05/12	1-4	1-4
	25/05/12	1-4	1-4
D12	30/04/12	1	3-4
P3	30/04/12	3	0
	17/05/12	3	1
P4	30/04/12	2	0
P5	17/05/12	0	1
	25/05/12	0-3	0-3

3.3 Habitat Suitability Index Scores

3.3.1 Habitat Suitability Index (HSI) scores were calculated for all the water bodies to aid evaluation of the ponds/ditches and their surrounding habitats for their suitability for great crested newts.

3.3.2 As shown in **Tables 8** and **9**, most of the water bodies on scored quite highly and the average score was 0.71 (a perfect great crested newt habitat would score 1). The reason for such high scores across the board is due to the large numbers of ditches and ponds within 1km of each other and large areas of suitable terrestrial habitat within a 500m radius.

3.3.3 Low scores were mainly influenced by poor water quality and high densities of fish, which meant that on average the ponds scored slightly lower than the ditches.

Table 8 HSI Scores for Ponds

Pond	1	2	3	4	5	6	7	8	9	10
Score	0.79	0.78	0.54	0.55	0.67	0.79	0.87	0.41	0.47	0.55

Table 9 HSI Scores for Ditches

Ditch	1	2	3	4	5	6	7	8	9	10	11	12	15	16
Score	0.81	0.86	0.86	0.74	0.85	0.86	0.87	0.79	0.79	0.81	0.55	0.57	0.77	0.58

4.0 EVALUATION

4.1 Great Crested Newts

4.1.1 The results of the amphibian survey suggest that great crested newts are not present in any of the surveyed water bodies on the Swanscombe peninsula north of the A226. No signs of this species were recorded during the survey in 2012 and the desk-top study revealed no historical records either. The HSI scores suggest that most of the water bodies on the peninsula are highly suitable habitats so it may be that the A226 as a busy main road has proved to be an effective barrier preventing colonisation of this area.

4.1.2 Further survey work may be required to establish whether or not great crested newts are present elsewhere within the proposed development area, but for which access has not yet been possible. The lake in Bamber pit where great crested newts were recorded in 1985 scored just 0.41 on the HSI due to the high densities of fish. It may be that the fish were introduced to the lake since the record was made as it now seems highly unlikely great crested newts are found in this area.

4.2 Other Amphibian Species

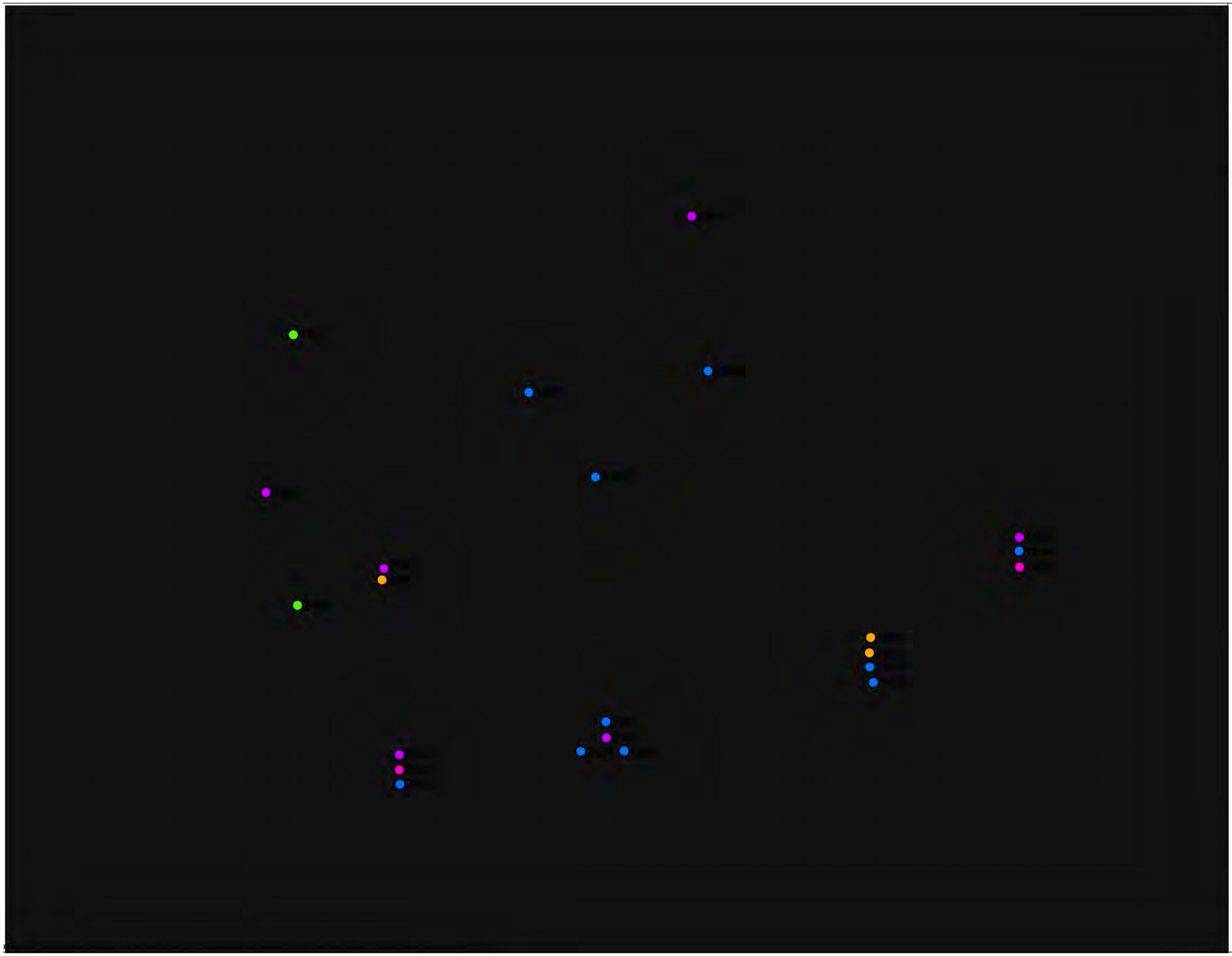
4.2.1 The results of the survey suggest that a small population of smooth newts and an unknown population of marsh frogs are found on the Swanscombe peninsula, mainly concentrated around Swanscombe Marshes.

5.0 CONCLUSIONS

5.1.1 Overall, it is concluded that great crested newts are not present in the surveyed water bodies on the Swanscombe Peninsula north of the A226. Further survey work may be required to establish whether or not they are present elsewhere within the proposed development area, for which access will be required.

5.1.2 A small population of smooth newts and an unknown population of marsh frogs (an invasive species) are the only amphibians currently found on the Swanscombe peninsula, mainly concentrated around Swanscombe Marshes.

FIGURES



KEY

Species

- Great crested newt
- Smooth newt
- Palmate newt
- Common toad
- Common frog

2000 Date of record

It should be noted that species locations are approximate - based on at least 6 figure grid references with an accuracy of 100m

0 200 400 m

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JUNE 2012

LONDON PARAMOUNT
Amphibian Survey Report

N

FIGURE 1
Amphibian Records
(based on desk-top study data provided by KMBRC)

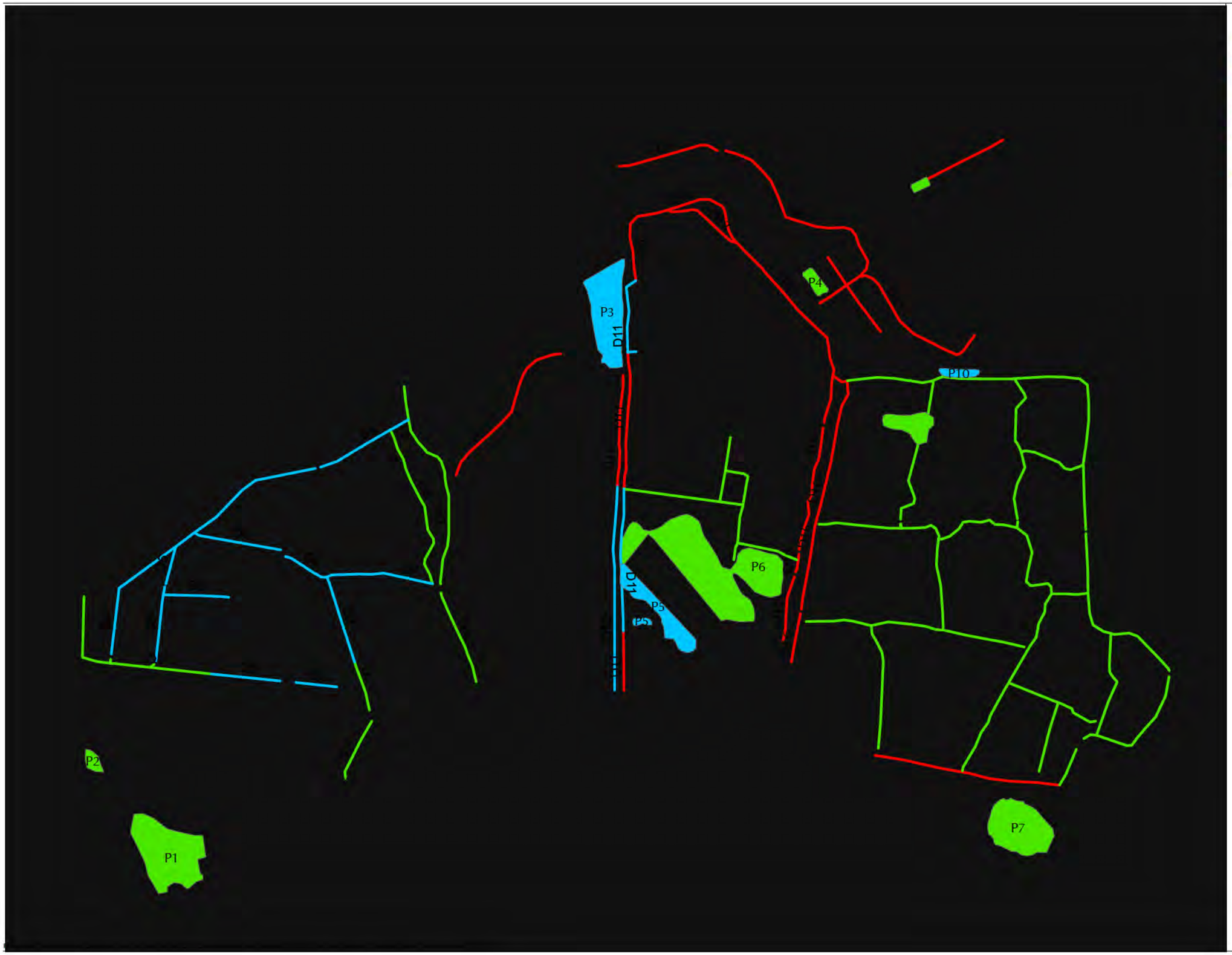

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FIGURE 2a

Location and Status of Water Bodies on Site

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FIGURE 2b

Location and Status of Water Bodies on Site

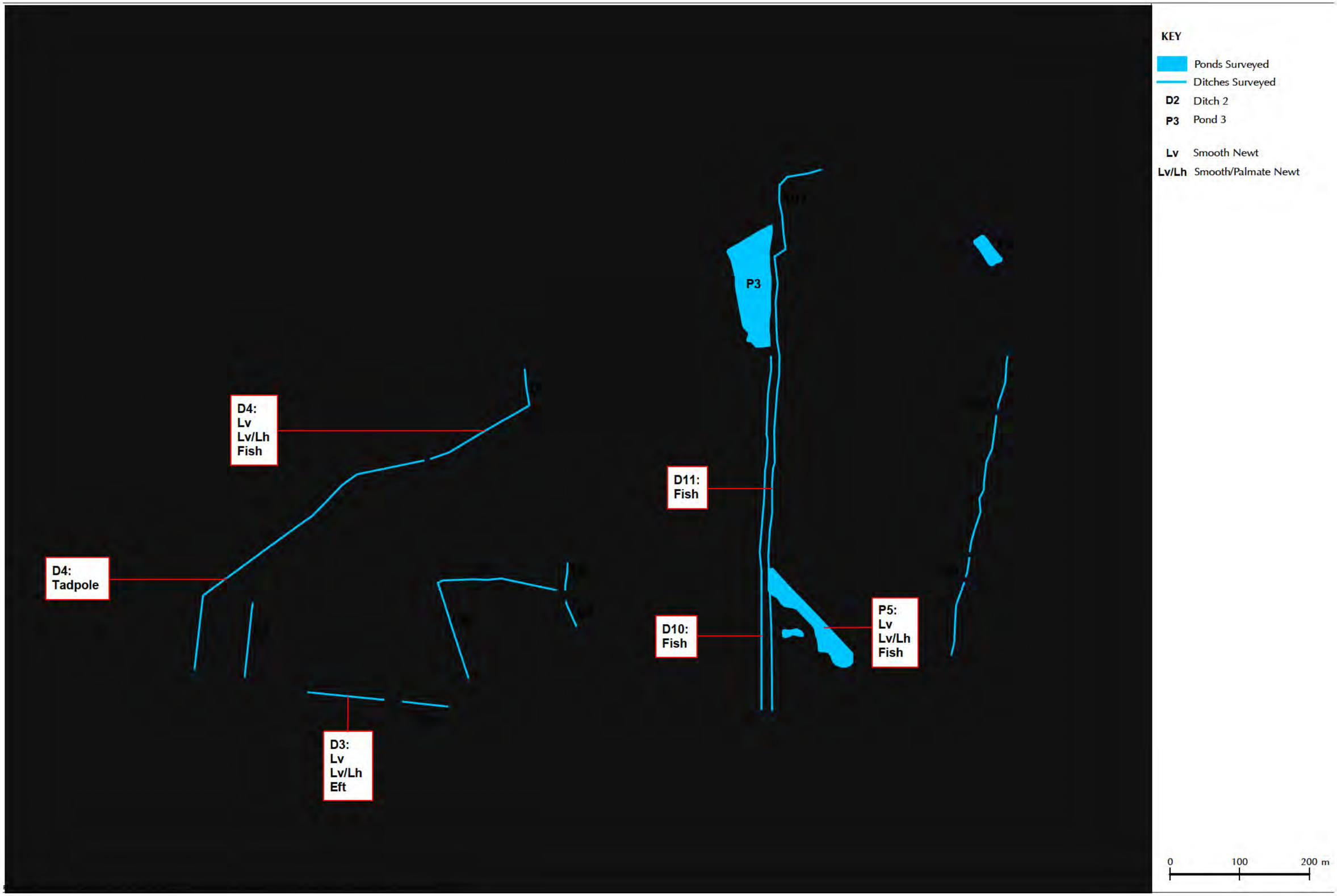

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FIGURE 3
Amphibian Records made during the 2012 Survey

APPENDICES

APPENDIX A
Site Photographs

Figure A1 Lake with surrounding willow scrub and steep-sided woodland covered banks (P1)

Figure A2 Lake fringed with common reed. The water is discoloured red/brown in places- possibly due to leachate pollution (P3)

Figure A3 Pond with steep-sided bare soil banks. The water is discoloured red/brown- possibly due to leachate contamination (P4)

Figure A4 Shallow ponds surrounded by marshy grassland (P5)

Figure A5 Lake surrounded with swamp dominated by common reed (P6)

Figure A6 A typical ditch on Swanscombe marshes – 5m wide channel dominated by common reed on the banks and occasional bulrush (D7)

Figure A7 A ditch choked with common reed (D16)

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Appendix 2: Habitat Suitability Index assessment and scores

Waterbody	1 Geo location	2 Size	3 Permanence	4 Wtr qual	5 Shade	6 Wtrfowl	7 Fish	8 Pond count within 1km	9 Terr habitat	10 Macrophytes	Product	HSI score
① Bamber Pit Pond	1		0.9	0.67	0.8	0.67	0.01	0.1	1	0.3	0.0001	0.40
	SE England - area A	n/a >2000m2	Never dries	Mod invert diversity	Approx 70%	Few birds	High fish density	No ponds within 1km without major barriers present - major roads or rail lines. Ponds may be present in Swanscombe to west but none idd	Good	Almost no macrophytes		
② Black Duck Marsh Ditch N	1		0.9	1	1	0.67	0.33	0.9	1	0.6	0.1075	0.80
	SE England - area A	n/a >2000m2	Never dries	High invert diversity	Little	Few birds	Small numbers of stickleback	2.5/km2	Good	Approx 30%		
③ Black Duck Marsh Ditch E (N)	1		0.9	1	0.6	0.67	0.33	0.93	1	0.4	0.0444	0.73
	SE England - area A	n/a >2000m2	Never dries	High invert diversity	Approx 80%	Few birds	Small numbers of stickleback	2.9/km2	Good	Approx 10%		
④ Black Duck Marsh Ditch E (S)	1		0.9	1	1	0.67	0.33	0.93	1	0.6	0.1110	0.80
	SE England - area A	n/a >2000m2	Never dries	High invert diversity	<60%	Few birds	Small numbers of stickleback	2.9/km2	Good	Approx 30%		
⑤ Swanscombe Centre - ditches	1		0.9	0.67	1	1	0.33	0.95	1	1	0.1890	0.85
	SE England - area A	n/a >2000m2	Never dries	Mod invert diversity	<60%	No effect	Small numbers of stickleback	3.2/km2	Good	70-80% overall		
⑤ Swanscombe Centre - lagoon	1		0.9	0.67	1	1	0.33	0.95	1	0.4	0.0756	0.77
	SE England - area A	n/a >2000m2	Never dries	Mod invert diversity	Little	No effect	Small numbers of stickleback	3.2/km2	Good	Approx 10%		
⑥ CTRL Wetland N (N)	1	0.92	0.9	1	1	1	1	0.95	1	0.7	0.5985	0.95
	SE England - area A	Approx 1,200m2	Never dries	High invert diversity	Little	No effect	Absent	3.2/km2	Good	Approx 40%		
⑥ CTRL Wetland N (S)	1		0.9	1	1	0.67	1	0.95	1	0.9	0.5156	0.94
	SE England - area A	n/a >2000m2	Never dries	High invert diversity	Little	Few birds	Absent	3.2/km2	Good	Approx 60%		
⑦ CTRL Wetland S	1	0.8	1	1	1	1	1	0.95	1	0.6	0.5700	0.95
	SE England - area A	Approx 400m2	Rarely dries	High invert diversity	Little	No effect	Absent	3.2/km2	Good	Approx 30%		
⑧ CTRL Wetland/Botany Marsh Ditches	1		1	0.67	1	1	0.33	0.95	1	0.8	0.1680	0.84
	SE England - area A	n/a >2000m2	Rarely dries	Mod invert diversity	Little	No effect	Small numbers of stickleback	3.2/km2	Good	Approx 80%		
⑨ Botany Marshes Ditch N	1		0.9	0.67	1	0.67	0.33	0.93	1	0.4	0.0496	0.74
	SE England - area A	n/a part of larger ditch >2000m2	Never dries	Mod invert diversity	Little	Few birds	Small numbers of stickleback	2.9/km2	Good	Approx 10%		
⑩ Botany Marshes Pond	1		0.9	1	1	1	1	0.9	1	0.35	0.2835	0.88
	SE England - area A		Never dries	High invert diversity	Little	No effect	Absent	2.5/km2	Good	Approx 5%		
⑳ Balancing Pond	1	0.85	0.9	1	1	0.67	0.67	0.1	1	0.5	0.0202	0.68
	SE England - area A	Approx 1,700m2	Never dries	High invert diversity	Little	Few birds	No fish known but possibly present	No ponds within 1km without major barriers present - major roads, rail lines, Ebbsfleet etc.	Good	Approx 20%		

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Sample/Report ID: 2015-1043
Client Identifier: Pond 4
Date of Receipt: 22/06/15

Condition on Receipt: Good
Visual Inspection of Volume: Passed
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	02/07/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1044
Client Identifier: top 6
Date of Receipt: 22/06/15

Condition on Receipt: Good
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	30/06/15

Report Prepared by: Dr Helen Rees
Signed: [redacted]
Position: Senior Research Scientist
Date of preparation: 02/07/15

Report Issued by: Claire Baker
Signed: [redacted]
Position: Research Scientist
Date of issue: 02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1045
Client Identifier: top 7
Date of Receipt: 22/06/15

Condition on Receipt: Good
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	02/07/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1046
Client Identifier: Pond 10
Date of Receipt: 22/06/15

Condition on Receipt: Low Sediment
Visual Inspection of Volume: Passed
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	30/06/15

Report Prepared by: Dr Helen Rees
Signed: [redacted]
Position: Senior Research Scientist
Date of preparation: 02/07/15

Report Issued by: Claire Baker
Signed: [redacted]
Position: Research Scientist
Date of issue: 02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1047
Condition on Receipt: High Sediment
Visual Inspection of Volume: Passed
Client Identifier: Pond 9
Description: 6x50mL - pond water samples in preservatives
Date of Receipt: 22/06/15
Material Tested: DNA extracted from pond water samples

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Indeterminate	Real time PCR	26/06/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1048
Client Identifier: Pond 5
Date of Receipt: 22/06/15

Condition on Receipt: Low Sediment
Visual Inspection of Volume: Passed
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	30/06/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1049
Client Identifier: Pond 1
Date of Receipt: 22/06/15

Condition on Receipt: Low Sediment
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	30/06/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1050
Client Identifier: Pond 8
Date of Receipt: 22/06/15

Condition on Receipt: High Sediment
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Indeterminate	Real time PCR	29/06/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-151
Client Identifier: Pond 2
Date of Receipt: 22/06/15

Condition on Receipt: Good
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	30/06/15

Report Prepared by:	Dr Helen Rees	Report Issued by:	Claire Baker
Signed:	[redacted]	Signed:	[redacted]
Position:	Senior Research Scientist	Position:	Research Scientist
Date of preparation:	02/07/15	Date of issue:	02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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Sample/Report ID: 2015-1052
Client Identifier: Pond 3
Date of Receipt: 22/06/15

Condition on Receipt: Good
Description: 6x50mL - pond water samples in preservatives
Material Tested: DNA extracted from pond water samples

Visual Inspection of Volume: Passed

Determinant	Result	Method	Date of Analysis
Great Crested Newt	Negative	Real time PCR	26/06/15

Report Prepared by: Dr Helen Rees
Signed: [redacted]
Position: Senior Research Scientist
Date of preparation: 02/07/15

Report Issued by: Claire Baker
Signed: [redacted]
Position: Research Scientist
Date of issue: 02/07/15

Notes: eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

Appendix 1: qPCR GCN eDNA analysis results breakdown

q-PCR GCN eDNA analysis Results

Experimental Samples	Number of Positive Replicate Reactions*
Extraction Blank	0 of 12
Pond 4	0 of 12
Top 6	0 of 12
Top 7	0 of 12
Pond 10	0 of 12
Pond 9	0 of 12
Pond 5	0 of 12
Pond 1	0 of 12
Pond 8	0 of 12
Pond 2	0 of 12
Pond 3	0 of 12

Controls	Number of Positive Replicate Reactions*
Negative PCR Control (Nuclease Free Water)	0 of 4
Positive Control GCN DNA 10^{-1} ng/µL	4 of 4
Positive Control GCN DNA 10^{-2} ng/uL	4 of 4
Positive Control GCN DNA 10^{-3} ng/µL	4 of 4
Positive Control GCN DNA 10^{-4} ng/µL	4 of 4

Inhibition Control	Number of Positive Replicate Reactions at Expected C_t value†
Pond 4	2 of 2
Top 6	2 of 2
Top 7	2 of 2
Pond 10	2 of 2
Pond 9	0 of 2
Pond 5	2 of 2
Pond 1	2 of 2
Pond 8	0 of 2
Pond 2	2 of 2
Pond 3	2 of 2

Degradation Control

Expected rate of decay	None expected within time frame
Pond 4	Within Limits
Top 6	Within Limits
Top 7	Within Limits
Pond 10	Within Limits
Pond 9	Evidence of decay or residual inhibition
Pond 5	Within Limits
Pond 1	Within Limits
Pond 8	Evidence of decay or residual inhibition
Pond 2	Within Limits
Pond 3	Within Limits

* A sample is considered as positive for great crested newt if any of the replicates are positive.
† If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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Annex EDP 26
2015 & 2016 Reptile Survey Report (CBA August 2016)

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London Resort Company Holdings (LRCH) Ltd.

London Paramount Entertainment Resort

2015 & 2016 Reptile Survey Report

DRAFT

August 2016

CHRIS BLANDFORD ASSOCIATES
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London Resort Company Holdings (LRCH) Ltd.

London Paramount Entertainment Resort

2015 & 2016 Reptile Survey Report

Approved	[redacted]
	Dominic Watkins
Position	Director
Date	19th August 2016
Revision	Draft

CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.1.2 The reptile desk study and survey was undertaken by CBA. This report details the methodology, results and evaluation of the desk study and of the survey undertaken during April, May and June (spring/early summer) and September and October (autumn) 2015, and during April and May 2016.

1.2 Aims

1.2.1 The aims of the reptile survey were to,

- identify whether reptile species are present within the Proposed Development Area;
- evaluate any reptile populations and assemblages present within the Proposed Development Area in relation to their nature conservation importance.

1.3 Reptile Legislation

1.3.1 All British reptiles are afforded some degree of legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (W&CA (as amended) 1981) largely as a consequence of a national decline in numbers associated with habitat loss.

1.3.2 The degree to which different species are protected varies. Smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* are considered 'fully protected'. However, both of these species are restricted in their distribution and would not occur in this study area. The other, more common reptile species, slow-worm *Anguis fragilis*, common lizard *Lacerta vivipara*, adder *Vipera berus* and grass snake *Natrix natrix* are only protected under Part of Section 9(1) and all of Section 9(5), making it an offence to:

- Intentionally kill, injure or take [Section 9(1)];
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell [Section 9(5)]

1.3.3 In all cases, the legislation applies to all life stages including eggs, juveniles and adults.

1.4 Listings

1.4.1 In response to the Convention on Biological Diversity (the Rio Summit) 1992, the UK introduced the UK Biodiversity Action Plan in 1994 (UK BAP). Initially, the sand lizard was the only reptile species with a specific UK BAP Species Action Plan. However, in 2007 the UK BAP was reviewed and several new species were added, including slow-worm, common lizard, smooth snake, adder, and grass snake. More recently the 'List of habitats and species important to biological conservation in England', prepared under Part 3, section 74 of the CRoW Act 2000, has been produced (Defra, 2000), and which largely mirrors the UK BAP list.

1.5 Survey Limitations

1.5.1 Due largely to access restrictions there was variation in the number of surveys carried out between different parts of the Proposed Development Area. For example some areas (e.g. the North East Tip, Sports Field/East Quarry and the northern part of Bamber Pit) were only surveyed during the autumn (Sept/Oct) survey period. **Figure 1** illustrates the location of survey areas identified in the report text and tables.

1.5.2 Variation in survey effort was addressed through further surveys being undertaken in the spring and early summer of 2016. **Table 1** identifies the date of surveys, the areas covered by each survey and the number of surveys per area, for both the 2015 spring/early summer and autumn survey periods, and the spring/early summer surveys conducted in 2016.

1.6 Key Findings

1.6.1 Three species of reptile, common lizard, slow worm and grass snake were recorded during the surveys, of which common lizard was the most widespread and abundant, being recorded in all survey areas and with an exceptional population on Swanscombe Peninsula.

1.6.2 Swanscombe Peninsula, Craylands Lane Pit/West Quarry, Bamber Pit and North of Springhead Nursery qualify as Key Reptile Sites and would be eligible for designation as Local Wildlife Sites based on their reptile populations/assemblages. They are therefore considered to be of County Importance for reptiles. All other areas are considered to be of Local Importance.

2.0 METHOD

2.1 Desk Study

2.1.1 The following Desk Study Data was considered.

Kent and Medway Biological Records Centre (KMBRC) - Desk-top study data, including records of reptile species, for the proposed Development Area and a 2km buffer, was obtained from in January 2015.
2003 Swanscombe Peninsula - reptile survey results dating from 2003 for a number of areas across Swanscombe Peninsula[1].
2010 Botany Marsh East - reptile survey results dating from 2010[2] were also obtained for Botany Marsh East from the landowner.

2.2 Field Survey Methodology

2.2.1 Areas with the potential to support reptiles were identified within the Proposed Development Area. These included habitats such as rough and tussocky grassland, tall ruderal ('weedy') vegetation, hedgerows, scrub and woodland edge, and features such as rubble and log piles and especially areas with combinations (mosaics) of these habitats, or transitions (ecotones) between them. It also included other. These habitats, or their combination, provide reptile species with, for example, suitable areas of cover, and for basking, foraging and dispersal.

2.2.2 The survey methodology was based on guidelines for reptile surveying provided by Froglife[3] and the Herpetofauna Workers' Manual[4], and involved placing heat traps in appropriate locations within the areas identified and described above as having the potential to support reptiles. The heat traps comprised heavy-duty mineral roofing felt (felts), half of which were approximately 0.5m x 0.5m and the other half of approximately 1m x 0.5m in size.

2.2.3 Froglife (1999) suggest placing a minimum of ten heat traps per hectare, and a total of 791 felts were placed in all accessible parts of the Proposed Development Area (Swanscombe Peninsula excluding the North East Tip, Manor Way, Craylands lane Pit/West Quarry, the southern part of Bamber Pit (Bamber South), Northfleet Landfill, and North of Springhead Nursery) in late March and early April 2015. A further 20 felts were placed in CTRL West in late April once access had been agreed.

[1] Halcrow Group Limited for Land Securities Development, 2004. Swanscombe Peninsula West: Reptile Survey Report, September 2003
[2] Entec UK Limited for Britannia Refined Metals, 2011. Northfleet Site Ecological Assessment: Ecological Baseline Report
[3] Froglife 1999. Advice Sheet 10 – Reptile Survey. An Introduction to planning, conducting and interpreting surveys for snake and lizard conservation.
[4] Gent, T and Gibson, S (eds) 1998. Herpetofauna Workers' Manual. JNCC, Peterborough

2.2.4 In addition, where present (Swanscombe Peninsula, Crayland's Lane Pit/West Quarry and Bamber South), old heat traps from previous reptile surveys were also utilised. These were generally relocated to suitable positions nearby and significantly increased the number and density of heat traps in these areas. A small number of sheets of corrugated tin (tins) were also used, mainly on the Swanscombe Peninsula. Survey areas and the location of felts within the Proposed Development Area are illustrated in **Figure 1**.

2.2.5 Due to the relatively continuous nature of the habitats present the Swanscombe Peninsula (Peninsula – Peninsula West, Peninsula Centre and Broadness) was, as far as possible, treated as a single survey area and covered by single surveys. Therefore, during the spring/early summer survey period the Proposed Development Area was divided between the Peninsula and the relatively more fragmented Non-Peninsula areas (Manor Way, Craylands lane Pit/West Quarry, Bamber South, Northfleet Landfill, CTRL West and North of Springhead Nursery - **Figure 1**). In some cases both Peninsula and Non-Peninsula were surveyed during single survey events (e.g. the morning or afternoon of a single day) but on other occasions they were subject to separate survey events, for example during the morning and afternoon of single days (e.g. Peninsula surveyed in the morning and Non-Peninsula in the afternoon and vice-versa). In total, the whole of the Peninsula was surveyed 14 times and Peninsula West and Centre combined were surveyed on an additional five and four occasions respectively. The Non-Peninsula was surveyed 14-18 times (**Table 1**).

2.2.6 During each survey in each area all heat traps (including old traps) and surrounding habitat and features were checked for the presence of reptiles, and any reptiles observed were identified and recorded.

2.2.7 A further 101 felts were placed in the areas that were not accessible for survey during the spring/early summer survey period, i.e. the North East Tip, Sport's Field/East Quarry and the northern part of Bamber Pit (Bamber North) during June and late August/early September. This made a total of 912 felts for the Proposed Development Area as a whole.

2.2.8 Surveys during the autumn survey period were carried out paying particular attention to those areas not surveyed during the spring/early summer survey period. However, they also included further surveys of areas covered during the spring/early summer period. The whole Peninsula (Peninsula West and Centre, North East Tip and Broadness) was surveyed on one occasion but the separate parts (especially Broadness) were surveyed a number of times (**Table 1**).

2.2.9 Prior to the commencement of the 2016 surveys a further five heat traps were added to the array in CTRL West, eight in Bamber Pit North, 30 within the Central Peninsula area and 27 on

Broadness, bringing the overall total to around 982 covering the whole of the Proposed Development Area.

2.2.10 Additionally, 23 heat traps situated along the western boundary of Broadness were relocated slightly further inland.

2.2.11 The number of felts placed in each survey area is listed below.

Peninsula		**Non-Peninsula**	
Peninsula West	169	Manor Way	10
Peninsula Centre	229	Crayland's lane Pit/West Quarry	45
Broadness	194	Sport's Field/East Quarry	43
North east Tip	47	Bamber North	19
		Bamber South	56
Total	**639**	Northfleet Landfill	64
		CTRL West	25
		North of Springhead Nursery	81

2.3 Evaluation Methodology

2.3.1 Guidelines for the selection of SSSIs[5] provide criteria for identifying nationally important populations and assemblages of reptiles. In addition, the methodology developed by Froglife[6] for the identification of Key Reptile Sites can be used to evaluate the importance of reptile populations / assemblages that do not meet these criteria. This is based on the maximum count of individuals obtained of each species during any single survey (summarised in **Table 2**). To qualify as a Key Reptile Site the site in question must meet at least one of the following criteria:

- support three or more reptile species;
- support two snake species;
- support an exceptional population of one species (see **Table 2**);
- supports an assemblage of species scoring at least four (see **Table 2**); or
- where it does not meet other criteria but population(s) present are of particular regional importance due to local rarity.

Guidance for the selection of Local Wildlife Sites in Kent[7] for reptiles is based on this methodology.

[5] JNCC 1989. Guidelines for selection of biological SSSI's. Peterborough
[6] Froglife 1999. Advice Sheet 10 – Reptile Survey. An Introduction to planning, conducting and interpreting surveys for snake and lizard conservation
[7] Kent Wildlife Trust on behalf of the Kent Nature Partnership, 2015. Local Wildlife Sites in Kent - Criteria for Selection and Delineation Version 1.5

Table 2 Population size class and scores used in the evaluation of reptile assemblages for the identification of Key Reptile Sites. Numbers refer to the maximum number of individual adults recorded during a single survey.

	Low Population ***Score 1***	**Good Population** ***Score 2***	**Exceptional Population** ***Score 3***
Adder	<5	5-10	>10
Grass snake	<5	5-10	>10
Slow worm	<5	5-20	>20
Common lizard	<5	5-20	>20

3.0 RESULTS

3.1 Desk Study

KMBRC

3.1.1 Desk study data received from KMBRC included records of common lizard, slow worm and grass snake from within and adjoining the proposed Development Area. Common lizards have been recorded from Swanscombe Peninsula and the Bamber Pit/Northfleet Landfill area. Slow worms have been recorded from a location near the western end of Craylands lane Pit/West Quarry, the Bamber Pit/Northfleet Landfill area and from within Swanscombe. Grass snakes have been recorded from the Swanscombe Peninsula, the Bamber Pit/Northfleet Landfill area and along the Ebbsfleet immediately east of the CTRL.

2003 Swanscombe Peninsula

3.1.2 Common lizards were widely recorded across the Peninsula and a small number of grass snakes were recorded close to Black Duck Marsh.

2010 Botany Marsh east

3.1.3 A good population of common lizard and small populations of slow worm and grass snake (see **Table 2**) were recorded in Botany Marsh East in 2010.

3.2 Survey results

3.2.1 Weather conditions during the surveys are detailed in **Table 3**.

3.2.2 Three species of reptile, common lizard, slow worm and grass snake were recorded during the survey. Details of all reptile records are provided in **Table 4** and locations where reptiles were recorded are illustrated in **Figure 2**. **Table 5** summarises the reptile species recorded in each survey area. **Table 6** identifies the number of reptiles of each species recorded during each survey, for all individuals and for adults only, and identifies the peak counts (adults only) for each species for each survey area. **Table 7** summarises the peak counts for each species for each survey area.

3.2.3 Common lizards were the most widespread and abundant species recorded. They were recorded in all survey areas. The highest peak count was of 49 adults on the Peninsula on the 23rd May 2016 pm. The next highest counts were 14 in Bamber South (15th May 2015 pm) and

11 in North of Springhead Nursery (15th May 2015 pm, 21st May 2015 am and 20th May 2016 pm)).

3.2.4 Slow worms were recorded in four of the survey areas. The highest peak counts were of 13 adults in Craylands Lane Pit/West Quarry (15th June 2015 am) and 7 in Bamber South (4th June 2015 am). A peak count of three was recorded on three occasions in North of Springhead Nursery and of two on two occasions in Bamber Pit North in May 2016. There was a single record of one individual on the Peninsula (24th April 2015 pm).

3.2.5 Grass snakes were recorded in all survey areas except Sports Field/East Quarry and CTRL West. The highest peak count was of six adults on the Peninsula on 8th June 2015 pm. A peak count of three was recorded in Bamber South (16th April 2015 am) and all other areas recorded a peak count of one. Grass snakes were also recorded in Botany Marsh East.

3.2.6 Adult, sub-adult and juvenile life stages of all three species were recorded.

Records by Area

Peninsula

3.2.7 Common lizards were recorded throughout the peninsula, but at lower density on Broadness than elsewhere, and here most records were from the embankments on its southern fringe. Grass snakes were recorded throughout the west and centre of the peninsula (but not Broadness), but there was a particular concentration of records in the west, in the areas surrounding and adjoining Black Duck Marsh. The single record of slow worm was from alongside the track between the CTRL Wetland to the west and Botany Marsh to the east.

3.2.8 The North East Tip was patchily but quite heavily disturbed by works during winter and spring of 2014-15 and only small numbers of common lizards were recorded here in autumn 2015.

Manor Way

3.2.9 Small numbers of common lizard and grass snake were recorded along the northern and eastern boundaries respectively.

Craylands Lane Pit/West Quarry

3.2.10 As well as common lizards this generated the largest number of records of slow worm of any part of the Proposed Development Area. There was a single record of grass snake, at the western end of the Pit.

Sports Field/East Quarry

3.2.11 Common lizards were recorded throughout the quarry but the highest density was in its northern half.

Bamber Pit (North and South)

3.2.12 Good numbers of all three species were consistently recorded throughout the larger, southern part of the Pit (Bamber South) and along the adjoining embankment beside the CTRL. Suitable habitat is more limited in the north of the Pit and only small numbers of common lizard, slow worm and grass snake were recorded here.

Northfleet Landfill

3.2.13 Common lizard and smaller numbers of grass snake were recorded along the southern, eastern and northern boundaries. Common lizards were also recorded in areas around the exposures near the centre.

CTRL West

3.2.14 Common lizards were recorded from the (spoil) mounds in the northern part of this area.

North of Springhead Nursery

3.2.15 Common lizard and grass snake were recorded throughout this area and slow worm largely along the eastern edge, adjoining the woodland along the Ebbsfleet.

4.0 EVALUATION

4.1 Survey Evaluation

4.1.1 Using Froglife's methodology[8] (section 2.2) **Table 8** identifies the population size class for each species, the number of species recorded and the assemblage score for each survey area. It also identifies which areas qualify as Key Reptile Sites and the relevant qualifying criteria.

4.1.2 The Peninsula, Craylands Lane Pit/West Quarry, Bamber Pit and North of Springhead Nursery qualify as Key Reptile Sites and would be eligible for designation as Local Wildlife Sites[9] based on their reptile populations/assemblages. They are therefore considered to be of County Importance for reptiles. All other areas are considered to be of Local Importance.

[8] Froglife 1999. Advice Sheet 10 – Reptile Survey. An Introduction to planning, conducting and interpreting surveys for snake and lizard conservation

[9] Kent Wildlife Trust on behalf of the Kent Nature Partnership, 2015. Local Wildlife Sites in Kent - Criteria for Selection and Delineation Version 1.5

TABLES

Table 1 Date and number of surveys

Spring/early summer

Date/time	Pen W + C	Pen all	Non-Pen	Comments
16/04/2015 am			✓	
20/04/2015 am		✓		
20/04/2015 pm			✓	
24/04/2015 am			✓	CTRL bank by Bamber Pit 1st surveyed
24/04/2015 pm	✓			
28/04/2015 am		✓		
11/05/2015 am		✓		
11/05/2015 pm			✓	CTRL W first surveyed
15/05/2015 am		✓	✓	
19/05/2015 am		✓	✓	
21/05/2015 am	✓		✓	
26/05/2015 pm	✓		✓	
01/06/2015 am		✓		
04/06/2015 am			✓	
08/06/2015 pm		✓	✓	
11/06/2015 am		✓	✓	
15/06/2015 am		✓	✓	
Total	**3**	**9**	**12**	

Autumn

Date/time	Pen W	Pen C	Bdness	NE Tip	Mnr Way	W Quarry	E Quarry	Bamber N	Bamber S	Nthflt L	CTRL W	N of Sprnghd
02/09/2015 pm							✓					
14/09/2015 am				✓								
14/09/2015 pm			✓									
22/09/2015 am				✓								
22/09/2015 pm			✓									
23/09/2015 am				✓			✓	✓	✓			
23/09/2015 pm	✓	✓	✓									
24/09/2015 am					✓		✓	✓				
24/09/2015 pm						✓					✓	
25/09/2015 am									✓			✓
28/09/2015 am-pm	✓							✓				
29/09/2015 am												✓
29/09/2015 pm			✓				✓	✓			✓	
30/09/2015 am							✓	✓	✓			
30/09/2015 pm			✓		✓	✓				✓		
01/10/2015 am	✓	✓		✓								
01/10/2015 pm							✓	✓				
08/10/2015 am				✓			✓	✓				
08/10/2015 pm												✓
Total	**3**	**2**	**5**	**5**	**2**	**2**	**7**	**7**	**3**	**1**	**2**	**3**

Spring / early summer 2016

Date / Time	Whole Pen	Bdness	E Quarry	Bamber N	Nthflt L	CTRL W
27/04/2016 pm		✓		✓	✓	✓
28/04/2016 am	✓					
06/05/2016 am	✓		✓	✓	✓	✓
13/05/2016 am	✓		✓	✓	✓	✓
16/05/2016 pm			✓	✓		
19/05/2016 pm			✓	✓		✓
20/05/2016 pm			✓	✓	✓	✓
23/05/2016 pm	✓		✓	✓	✓	✓
27/05/2016 am			✓	✓		✓
Total	**4**	**1**	**7**	**8**	**6**	**7**

Spring/early summer + autumn

Area	Whole Pen	Pen W	Pen C	Bdness	NE Tip	Mnr Way	W Quarry	E Quarry	Bamber N	Bamber S	Nthflt L	CTRL W	N of Sprnghd
Total	**14**	**19**	**18**	**19**	**9**	**14**	**14**	**14**	**15**	**15**	**18**	**16**	**15**

Table 3 Weather conditions during surveys

Spring/early summer Date/time	Temp (°C)	Wind (Beaufort)	Cloud (%)	Rain
16/04/2015 am	15-19	2-4	5-60	No
20/04/2015 am	14-17.5	2-4	<5	No
20/04/2015 pm	19.5-17	2-4	<5	No
24/04/2015 am	12-15.5	1-2	80	No
24/04/2015 pm	21-20	1-2	General v thin	No
28/04/2015 am	12-18	1-3	10-20	No
11/05/2015 pm	24-19	1-2	10-50	No
15/05/2015 am	13-18	1-3	50-100	No - but drying after overnight rain
19/05/2015 am	13-18	4	50-90	Occasional light showers in latter part
21/05/2015 am	16-20	1-2	20-80	No
26/05/2015 pm	20-18	1	50-80	No
01/06/2015 am	16-19.5	2-3	50-100	One short shower halfway
04/06/2015 am	16-20	1-2	0-30	No
08/06/2015 pm	18-16	2-4	80-100	No
11/06/2015 am	19-20	3-4	0	No
15/06/2015 am	17-19	3-4	90-20s	No

Autumn Date/time	Temp (°C)	Wind (Beaufort)	Cloud (%)	Rain
02/09/2015 pm	18	2	50	Recent shower bt dry during survey
14/09/2015 am	19		0	No
14/09/2015 am	18		40	No
14/09/2015 pm	19-16	1-2	60	No
22/09/2015 am	18		40	No
22/09/2015 pm	18		50	No
23/09/2015 am	15-19	1-3	<5-25	No - ground wet after rain but drying
23/09/2015 pm	19-18	3	20-100	No - drying after early rain
24/09/2015 am	17.5-19.5	2-4	40-100	No
24/09/2015 pm	19.5-18	3-4	70-50	No
25/09/2015 am	16-18		40	No
28/09/2015 am-pm	16-17		50	No
29/09/2015 am	19-20	4-5	10-20	No
29/09/2015 pm	21-19	4-5	10-20	No
30/09/2015 am	17.5-19.5	4-5	30-10	No
30/09/2015 pm	20.5-18	4-5	10-20	No
01/10/2015 am	19-20	4-5	10-30	No
01/10/2015 pm	19-18	4-5	30-10	No
08/10/2015 am	18-19	1-2	10-30	No
08/10/2015 pm	19-18.5	2-3	50-60	No

Spring 2016 Date/time	Temp (°C)	Wind (Beaufort)	Cloud (%)	Rain
27/04/2016 pm				No
28/04/2016 am				No
06/05/2016 am	14-19	1-2	10	No
13/05/2016 am	15-20	3-4	30-10	No
16/05/2016 pm	16-17	0-1	70	No
19/05/2016 pm	16-17	1-2	90	No
20/05/2016 pm	14-17	2-4	50	No
23/05/2016 pm	15-19	2-4	90-40	No - a few spots later
27/05/2016 am	14	1-2	70	No

Table 4 Reptile survey results (excluding areas with no records)

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
30/03/2015 am	Peninsula	247	1	cl	a	Old felt nearby during set up
02/04/2015 pm	Bamber Pit S	763-774	3	sw	2a + 1j	Under old felts along south edge of pit during set up
		796	1	gs	a	Basking nearby during set up
13/04/2015 am	N of Springhd Nursery	705	1	cl	a	
		706	1	cl	a	
		711	1	cl	a	
15/04/2015 am	Peninsula	3	1	cl	a	Nearby
		25	1	gs	a	Nearby
		62	1	cl	a	Nearby, in trough between embankments
		415	1	cl	a	Nearby
		595-596	1	cl	a	Nearby
16/04/2015 am	West Quarry	625	1	sw	a	Old felt nearby
		633	1	cl	a	Old felt nearby
		635	1	sw	a	
		635	1	cl	j	
		636	2	sw	1a + 1sa	
		637	2	sw	a	Old felt nearby
		638	1	sw	sa	
		639	1	sw	j	
		640	1	sw	a	
	Bamber Pit S	762	1	cl	a	
		764	2	sw	a	Old felt nearby
		764	1	gs	a	Old felt nearby
		772	2	cl	1a + 1j	
		774	1	sw	a	
		782	1	sw	a	Old felt nearby
		783	1	gs	a	
		785	1	sw	a	
		785	1	cl	a	
		792				1 toad
		802	2	sw	a	Old felt nearby
		809	1	gs	a	Dead nearby
		810	1	cl	j	Old felt nearby
	Northfleet Landfill	214	1	cl	a	
		217	2	cl	a	
	N of Springhd Nursery	698	1	cl	a	
		715	2	cl	j	
		716	1	cl	a	
		717	1	cl	sa	
		734	1	cl	a	
20/04/2015 am	Peninsula	4	1	gs	sa	
		6	1	cl	a	
		58-60	1	cl	a	Old felt nearby
		120	1	cl	a	
		227	1	cl	a	Nearby
		238	1	cl	a	
		257	1	cl	j	On path nearby
		267	2	gs	j	Under old felts nearby
		281	1	cl	a	Nearby, on rock armour immediately SE of pylon
		397	1	cl	a	
		449	1	cl	a	
		496	1	cl	a	
		596	1	cl	a	
		598	1	cl	a	
	Botany Marsh East	644	1	gs	a	
20/04/2015 pm	West Quarry	618	1	cl	a	
		634	1	sw	a	
		637	1	sw	sa	
		639	1	sw	j	
		640	1	sw	a	
	Bamber Pit S	765	1	cl	a	Nearby
		764	1	cl	sa	Old felt nearby
		764	1	sw	a	Old felt nearby
		774	1	sw	a	
		776	1	cl	a	Old felt nearby
		779	1	cl	a	Nearby
		792				1 toad
		802	2	sw	a	Old felt nearby
		802	1	cl	a	Old felt nearby
		809	1	cl	j	
	Northfleet Landfill	202	1	gs	a	
		206	1	cl	j	
	N of Springhd Nursery	696	1	cl	sa	
		706	1	cl	j	
		710	1	cl	a	
		711	1	cl	a	
		712	1	cl	a	
		715	3	cl	j	
		722	1	cl	j	
		735	1	cl	a	
		739	1	cl	a	
		742	1	cl	sa	
		746	1	cl	j	
		747	1	cl	a	
		748	1	cl	a	
		752	1	cl	a	
22/04/2015 pm	Peninsula	281-306	1	cl	a	On path, SW corner of inlet
24/04/2015 am	Manor Way	820	1	cl	sa	
	West Quarry	618	1	sw	j	
		625	1	sw	a	Old felt nearby
		636	2	sw	1a + 1j	
		637	1	sw	a	Old felt nearby
		638	1	sw	j	
		640	1	sw	a	
		840	1	cl	j	
		841	1	sw	a	
		844	1	sw	a	
	Bamber Pit S	761-774	12	sw	5a + 2sa + 5j	Along S edge of site
		766	1	cl	j	
		787	3	cl	1a + 2sa	Old felt nearby
		790	2	cl	sa	Old felt nearby
		792	1	sw	sa	Old felt nearby
		847	3	cl	2a + 1sa	
	Northfleet Landfill	200	1	cl	a	
		202	1	gs	a	
		205	1	cl	a	
		206	1	cl	a	
		212	1	cl	j	
		220	1	cl	j	
		223	1	cl	a	
	N of Springhd Nursery	710	1	cl	a	
		711	1	cl	a	
		712	1	cl	a	
		714	1	sw	j	
		715	1	cl	a	
		730	1	cl	a	
		746	1	cl	a	
		752	1	cl	a	
		756	1	cl	a	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
24/04/2015 pm	Peninsula	3	1	cl	j	
		20	1	cl	a	Old felt nearby
		20	1	cl	a	
		26	1	cl	a	
		51	1	cl	a	Old felt nearby
		57	1	cl	a	
		58	1	cl	a	
		59	1	cl	a	
		69	1	gs	a	
		71	1	cl	a	
		92	1	cl	a	Old felt nearby
		145	1	sw	a	
		229	1	cl	a	
		230	2	cl	1a + 1j	Old felt nearby
		384	1	gs	a	Nearby, crossing track
		395	1	cl	a	
		398	1	cl	sa	Old felt nearby
		415-420	2	cl	a	Old felts in area to S
		473	2	cl	a	
		485	1	cl	a	
		494	2	cl	a	
		496	1	cl	a	
		497	1	cl	a	
		512	1	cl	a	
		514	1	cl	a	
		517	1	cl	a	
		522	1	cl	a	
		531	1	cl	a	
		550	1	cl	a	
28/04/2015 am	Peninsula	3	1	cl	a	
		9-10	1	cl	a	Between felts
		18-19	1	cl	a	Old felt between
		40	1	cl	a	On bank beside marsh SE of felt
		69	1	gs	a	
		108	1	cl	a	Tin on other side of track
		226-227	1	gs	a	Between felts
		235	1	cl	a	
		238	1	cl	a	
		242-243	1	gs	a	By log pile between felts
		243	1	cl	a	
		253	1	cl	a	
		256	1	cl	a	
		256-257	1	cl	a	Between felts
		399	1	cl	a	Old felt nearby
		422	1	cl	a	Old felt nearby
		430-431	1	cl	a	Old felt nearby
		497	1	cl	a	
11/05/2015 pm	Peninsula	7	1	cl	a	Old felt nearby
		13	1	cl	a	
		17-18	1	cl	a	Between felts
		55	1	cl	a	On tin beside herp fence on boundary with construction site
		120	2	cl	1a + 1j	
		135	1	cl	a	
		145	1	gs	a	
		148	1	cl	a	
		227	1	cl	a	
		229	2	cl	1a + 1sa	
		232	2	gs	sa	Tin nearby
		232	1	gs	sa	
		234	1	cl	a	Nearby
		238	1	gs	sa	
		267	1	gs	a	Old felt nearby - 10m to S
		291	1	cl	a	
		348	1	cl	a	
		410	1	cl	a	Old felt nearby, on mound
		416	1	gs	a	Old felt to S
		421	1	cl	sa	Old felt nearby
		430-431	1	cl	a	Old felt between
		455	1	cl	a	
		459	2	cl	sa	
		472	1	cl	a	
		479	1	cl	a	Old felt nearby
		481	1	cl	a	
		515	1	cl	a	
		521	1	cl	a	
		534	2	cl	a	
		568	1	cl	a	
11/05/2015 pm	West Quarry	606	1	sw	j	
		612	1	sw	a	Old felt nearby
		615	1	cl	a	
		616	1	cl	j	Old felt nearby
		636	2	sw	1a + 1j	Old felt on other side of track
		637	2	sw	1a + 1j	
	Bamber Pit S	761	1	cl	a	Old felt nearby
		766	2	cl	a	Old felt nearby
		766	1	gs	j	Old felt nearby
		768	2	cl	a	
		769	1	cl	a	Old felt nearby
		770	2	cl	a	Old felt nearby
		771	1	cl	a	
		771	2	sw	1a + 1j	
		772	3	cl	a	Old felt nearby
		779	1	cl	j	Old felt nearby
		787	1	sw	j	Old felt nearby
		796	1	gs	j	Old felt nearby
		802	1	sw	sa	Old felt nearby
		846	1	cl	a	
	Northfleet Landfill	204	1	cl	j	
		206	1	cl	a	
		218	1	cl	a	
		219	1	cl	j	
		221	1	gs	j	
	N of Springhd Nursery	681	1	cl	a	
		690	1	cl	a	
		693	1	cl	a	
		697	1	cl	a	
		697	1	sw	j	
		705	1	sw	j	
		708	1	cl	a	
		709	1	cl	a	
		716	1	cl	a	
		757	1	cl	a	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
15/05/2015 am	Peninsula	3	1	cl	a	
		14	1	cl	a	Old felt nearby
		20	1	cl	j	
		25	1	cl	a	
		30	1	cl	a	
		57	1	gs	a	
		97	1	cl	a	Old felt nearby
		145	1	cl	a	
		227	1	gs	a	Old felt nearby
		230	2	cl	j	Old felt nearby
		278	1	cl	a	
		284	1	cl	a	
		397	1	cl	a	Old felt nearby
		406	1	cl	a	Nearby
		407	1	cl	a	
		473	1	cl	a	
		512	1	cl	j	
		570	1	cl	sa	
		598	1	cl	a	
	West Quarry	631-632	5	sw	sa	Old felt between
		841	1	sw	a	
		844	1	sw	a	
	Bamber Pit S	762	2	cl	sa	
		763	1	cl	a	Old felt nearby
		766	1	gs	j	
		766	3	cl	1a +2sa	Old felts nearby
		769	2	cl	a	Old felts nearby
		770	3	cl	2a + 1sa	Old felts nearby
		773	1	cl	a	
		776	1	cl	sa	
		782	1	cl	sa	Old felt nearby
		790	2	cl	1a + 1sa	
		790	1	cl	a	Old felt nearby
		792	1	cl	sa	
		794	1	cl	sa	
		795	1	gs	a	
		796	1	cl	a	
		799	1	cl	a	Old felt nearby
		800	2	cl	a	
		847	1	cl	a	
		848	3	cl	2a + 1sa	
		850	1	cl	sa	
	Northfleet Landfill		1	cl	a	On grass
		216	1	cl	a	
		217	1	cl	a	
	N of Springhd Nursery	696	1	cl	a	
		706	1	cl	sa	
		708	1	cl	a	
		711	3	cl	a	
		712	1	cl	a	
		714	1	cl	a	
		714	1	gs	j	
		724	1	cl	a	
		736	1	cl	sa	
		739	2	cl	1a + 1sa	
		740	1	cl	a	
		740	1	gs	sa	
		749	1	cl	1a + 1sa	
		751	1	cl	sa	
		752	1	cl	a	
		756	2	cl	sa	
		756	2	gs	j	
		760	1	cl	a	
19/05/2015 am	Peninsula	7	1	cl	a	
		12	1	gs	a	
		13	1	cl	a	
		24	1	cl	j	
		57	1	gs	a	
		68	1	gs	a	
		124	1	cl	a	
		137	1	cl	a	
		145	1	cl	a	
		226	1	gs	a	
		227	3	cl	1a +2j	Old felts nearby
		227	2	gs	j	Old felt nearby
		228	1	cl	a	
		243	1	cl	sa	
		245	1	cl	a	
		277	2	gs	j	
		291	1	cl	a	
		397	1	cl	sa	Old felt nearby
		398	1	cl	a	
		512	1	cl	a	
		568	1	cl	a	
	West Quarry	616	2	cl	j	
		616	1	cl	j	Old felt nearby
		632	1	sw	j	Old felt nearby
		635	1	cl	a	
		637	1	sw	j	
		637	1	sw	j	Old felt nearby
		638	1	sw	a	Old felt opposite side of track
		842	1	sw	a	Old carpet few m to N
	Bamber Pit S	764	1	sw	j	
		766	1	cl	a	Old felt nearby
		770	3	cl	j	Old felts nearby
		772	1	cl	j	Old felt nearby
		772	4	cl	2a +1sa +1j	
		772	1	gs	j	Old felt nearby
		773	1	cl	sa	Old felt nearby
		774	1	cl	j	Old felt nearby
		775	1	cl	a	Old felt nearby
		777	1	cl	a	Old felt nearby
		778	1	cl	j	
		787	4	cl	1a +2sa +1j	
		792	3	cl	1a +2j	Old felt nearby
		799	1	gs	j	Old felt nearby
		802	1	cl	a	
		802	1	gs	j	
		846	1	cl	sa	
		847	1	cl	a	
	Northfleet Landfill	174	1	cl	a	
		225				Piece of sw
	N of Springhd Nursery	740	1	gs	sa	
		751	1	gs	j	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
21/05/2015 am	Peninsula	25	1	cl	sa	
		76	1	cl	a	
		124	1	cl	a	
		145	1	cl	a	
		226	1	cl	a	Old felt nearby
		227	1	gs	a	Old felt nearby
		240	1	cl	sa	Old felt nearby
		400	1	cl	a	
		406	1	cl	a	
		421-422	1	cl	a	Old felt between
		430-431	1	cl	a	Old felt between
		473	1	cl	a	
		831	1	cl	a	
	West Quarry	601	2	sw	1a + 1j	
		632	1	sw	a	Old carpet nearby
		635	1	cl	a	Old felt down towards tunnel
		635	1	sw	a	Old felt down towards tunnel
		638	2	sw	1sa + 1j	Old felt nearby
		639	1	sw	j	
		640	1	sw	a	
		844	1	sw	j	
	Bamber Pit S	764	3	sw	a	Old felt 5m to W
		764	1	gs	sa	Old felt 5m to W
		766	1	gs	a	Old felt 10m to W
		767	1	cl	a	Old felt nearby
		771	1	sw	a	
		771	2	sw	j	Old felt 10m to S
		773	1	sw	a	Old felt nearby
		776	1	gs	sa	
		776	1	gs	sa	Old felt 10m to N
		780	1	cl	a	
		785	1	cl	a	Old felt nearby
		787	1	cl	sa	Old felt 10m to N
		787	1	cl	sa	
		787	1	gs	j	Old felt nearby
		792	1	cl	a	Old felt 5m to N
		793	1	cl	a	Old felt nearby
		793	1	gs	j	Old felt 10m to S
		802	1	sw	a	Old felt nearby
		802	2	cl	a	Old felt nearby
		802	1	gs	sa	Old felt nearby
		806	1	sw	a	
	N of Springhd Nursery	708	3	cl	1a + 2sa	
		709	1	cl	sa	
		710	1	cl	a	
		715	2	cl	sa	
		717	1	cl	a	
		719	1	cl	sa	
		722	1	gs	j	
		724	2	cl	1a + 1sa	
		726	2	gs	sa	
		726	1	cl	a	Nearby
		736	1	cl	a	
		739	1	cl	a	
		740	2	cl	1a + 1sa	
		740	1	gs	a	
		744	1	cl	a	
		747	1	cl	a	
		748	1	cl	a	
		756	2	gs	sa	
		757	1	gs	sa	
26/05/2015 pm	Peninsula	20	1	cl	a	Old felt nearby
		21	1	cl	a	Old felt nearby
		50	1	gs	a	
		57	1	cl	a	
		145	1	cl	a	
		256	1	cl	a	Old felt nearby
		262	2	gs	j	Old felt nearby
		473	1	cl	a	
		543	1	gs	a	
	West Quarry	601	1	sw	a	
		606	1	sw	sa	
		632	1	sw	sa	Old carpet nearby
		634	1	sw	a	Old felt nearby
		635	1	sw	sa	Old felt down towards tunnel
		636	1	cl	a	
		637	1	sw	sa	Old felt nearby
		638	1	sw	sa	Old felt nearby
		639	1	sw	sa	Old felt nearby
		640	1	sw	a	
		640	1	sw	sa	Old felt nearby
		640	1	sw	sa	Old felt nearby
		843	1	cl	a	
	Bamber Pit S	764	1	cl	a	Old felt nearby
		765	2	cl	a	Old felt nearby
		766	2	cl	1a + 1j	
		785	1	cl	j	
		798	1	gs	j	Old felt nearby
		846	1	cl	a	
	Northfleet Landfill	174	1	cl	a	
		208	1	cl	a	
		220	1	cl	a	
		223	1	cl	a	
		224	1	cl	a	
		827	2	cl	a	
		828	1	cl	a	
	N of Springhd Nursery	693	1	cl	a	
		699	1	cl	j	
		700	2	cl	1a +1j	
		710	1	cl	j	
		711	1	cl	a	
		756	1	gs	j	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
01/06/2015 am	Peninsula	1	3	cl	j	Old felts to W
		30	1	gs	j	Old felt nearby
		48	1	gs	sa	Old felt nearby
		58	1	cl	j	Old felt nearby
		62	1	cl	a	
		67	1	cl	j	
		80	1	cl	a	
		153	1	cl	a	
		267	1	gs	sa	Old felt nearby
		280	1	cl	a	
		317	1	cl	a	
		397	1	cl	a	Old felt 10m to E
		411	1	cl	a	
		411	1	cl	sa	Old felt nearby
		412	1	cl	a	Tin nearby
		414	1	cl	a	
		424	1	cl	a	
		429	1	cl	a	
		447	1	cl	a	Old felt 10m to SE
		473	1	cl	a	
		496-497	1	cl	a	Old felt between
		536	1	gs	a	
		541-542				Gs skin beneath old felt between, on S side of mound
		553	1	cl	a	Old felt in far SW corner of area
		596	1	cl	a	
04/06/2015 am	West Quarry	633	1	sw	a	
		635	1	sw	a	
		635	1	cl	a	Old felt nearby
	Bamber Pit S	763	1	sw	a	Old felt 5m to E
		763	1	sw	j	Old felt 5m to S
		764	1	sw	j	Old felt 10m to W
		766	1	sw	a	
		771	1	cl	a	Old felt 5m to N
		772	2	cl	a	
		773	1	cl	a	
		775	1	sw	sa	
		776	1	cl	a	
		776	1	sw	j	
		779	1	sw	a	
		781-782	1	sw	a	Old felt between
		782	1	sw	a	
		787	1	sw	a	
		787	1	sw	a	Old felt 5m to E
	Northfleet Landfill	202	1	gs	a	
		824	2	gs	j	
	N of Springhd Nursery	708	3	sw	a	
		708	1	gs	j	
		711	1	cl	a	
		714	2	sw	a	
		715	1	sw	a	
		724	1	cl	a	
		751	1	cl	a	
08/06/2015 pm	Peninsula	1	1	cl	j	Old felt nearby
		2	1	cl	a	
		18	1	cl	j	Old felt nearby
		39	2	gs	a	Old felt 5m to E
		39	1	cl	a	Old felt 5m to W
		40	1	gs	a	Old felt 5m to S
		58	1	cl	a	
		59	1	cl	j	
		62	1	cl	a	
		67	2	cl	a	
		68	1	cl	a	
		70	1	cl	a	
		71	1	cl	a	
		75	1	cl	a	
		98	1	cl	a	Old felt nearby
		226	1	gs	a	Old felt nearby
		227	4	cl	3a + 1j	Old felts nearby
		227	1	gs	j	Old felt nearby
		228	1	gs	a	Old felt nearby
		230	1	gs	a	Old felt nearby
		232	1	gs	j	Old felt nearby
		232	1	cl	a	
		256	1	gs	j	
		257	1	cl	a	Old felt nearby
		257	2	gs	j	Old felt nearby
		260	1	cl	j	Old felt nearby
		277	1	gs	j	
		281	1	cl	sa	
		282-283	1	cl	a	Old felt between
		286	1	cl	sa	
		362	1	cl	sa	
		397	1	cl	a	Old felt on bank at S end of lagoon
		398	1	cl	a	
		414	1	cl	a	
		431	1	cl	a	
		447	1	cl	a	
		455	1	cl	a	
		455	2	cl	a	Old felt nearby
		480	2	cl	a	
		502	1	cl	a	Old felt nearby
		532	1	cl	a	Western one
		590	1	cl	a	
		836	1	cl	a	Old felt nearby
	Manor Way	817	1	cl	a	
	West Quarry	611	2	sw	j	
		617	1	cl	a	Old felt nearby
		624	1	sw	a	
		632	3	sw	j	Carpet tile nearby
		633	1	sw	sa	
		635	3	cl	sa	Old felt down towards tunnel
		635	1	cl	a	Old felt nearby
		637	1	sw	a	
		637	4	sw	1a +3j	Old felt nearby
		640	2	sw	a	
		840	1	sw	sa	
		841	1	cl	a	
		841	1	sw	a	
		844	1	sw	a	
	Bamber Pit S	765	1	cl	a	Old felt nearby
		774	1	sw	a	
		774	1	cl	a	Old felt nearby
		775	1	cl	a	Old felt nearby
		776	2	cl	j	Old felt nearby
		787	1	cl	j	Old felt nearby
		796	1	cl	a	Old felt nearby
		800	3	sw	j	
	Northfleet Landfill	198	1	gs	j	
		212	1	cl	sa	
	N of Springhd Nursery	704	1	cl	a	
		706	1	cl	j	
		708	1	cl	a	
		708	2	sw	a	
		710	1	cl	a	
		710	1	cl	a	
		711	2	cl	a	
		712	1	cl	a	
		712	1	sw	a	
		714	1	sw	j	
		715	1	sw	j	
		715	1	cl	a	
		719	1	cl	j	
		740	1	cl	a	
		756	1	gs	j	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
11/06/2015 am	Peninsula	80	1	gs	a	
		240	1	gs	a	
		252	1	gs	a	
		257	2	gs	j	Old felt nearby
		398-400	1	cl	a	Old felt between
		409-410	1	cl	sa	
		415	1	cl	a	Old felt nearby
		510	1	cl	a	Old felt between
	West Quarry	621	1	cl	a	Old felt nearby
		621	1	sw	a	Old felt nearby
		632	1	sw	j	Old carpet nearby
		635	1	sw	a	Old felt down towards tunnel
		635	1	cl	a	
		640	2	sw	j	
	Bamber Pit S	787	1	cl	a	Old felt nearby
		791	1	cl	a	Old felt nearby
		802	1	gs	a	Old felt nearby
		802	2	sw	a	Old felts nearby
		851				gs skin
	N of Springhd Nursery	708	1	sw	a	
		710	1	sw	a	
		711	1	cl	a	In vegetation nearby
		712	1	sw	a	
		715	1	gs	j	
		715	1	sw	sa	
		739	1	gs	j	
15/06/2015 am	Peninsula	1	1	cl	a	Old felt nearby
		2	2	cl	j	
		6	1	cl	a	
		14	1	cl	a	
		114	1	cl	a	
		129	1	cl	j	
		226	2	cl	j	Old felt nearby
		226	2	gs	1a + 1j	Old felt nearby
		243	1	cl	j	Old felt nearby
		252	1	cl	a	
		252	2	gs	a	
		253	1	gs	a	
		257	1	gs	j	Old felt nearby
	West Quarry	606	1	sw	sa	
		611	1	sw	sa	
		624	2	sw	a	Old felt nearby
		624	1	sw	a	
		632-633	4	sw	sa	Old felt between
		635	1	sw	a	Old felt nearby
		635	1	sw	a	
		637	3	sw	1a +2sa	Old felt nearby
		840	2	sw	1a + 1sa	
		841	2	sw	a	
		843	5	sw	4a + 1sa	
		844	2	sw	1a + 1sa	
	Bamber Pit S	762	1	cl	sa	Old felt nearby
		763	1	cl	a	Old felt nearby
		766	2	sw	a	Old felt nearby
		774	2	cl	1a + 1sa	Old felt nearby
		846	1	cl	a	
	N of Springhd Nursery	708	1	sw	sa	
		712	2	sw	a	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
02/09/2015 pm	East Quarry	914	1	cl	a	
14/09/2015 am	NE Tip	162	1	cl	a	
		163	2	cl	a	
14/09/2015 pm	Broadness	126	1	cl	a	
		135	1	cl	a	
		150	1	cl	a	
		158	1	cl	a	
		330	1	cl	a	
		578	2	cl	sa	Tin near pylon
22/09/2015 pm	Broadness	126	1	cl	a	
		129	1	cl	sa	
		136	1	cl	sa	
		152	1	cl	a	
		158	2	cl	a	
		338	1	cl	a	
23/09/2015 am	East Quarry	900	1	cl	a	
		916	1	cl	a	Nearby
	Bamber Pit S	761	1	cl	j	
		766	1	gs	sa	Old felt nearby
		769	1	cl	a	Old felt nearby
		770	1	toad	j	Old felt nearby
		776	1	cl	sa	Old felt nearby
		777	1	cl	a	Old felt nearby
		782	1	sw	a	
		785	1	cl	sa	Old felt nearby
		785	1	gs	j	Old felt nearby
		786	1	cl	j	Old felt nearby
		791	1	cl	a	Old felt nearby
		793	1	cl	j	10 m to S
		794	1	cl	j	
		796	1	gs	j	Old felt nearby
		797	1	gs	sa	Old felt nearby
		799	1	gs	sa	
		847	1	sw	a	
		850	2	sw	a	
23/09/2015 pm	Peninsula W	7	1	cl	j	Old felt nearby
		14	1	cl	j	Old felt nearby
		15	2	cl	a	
		17	1	cl	j	
		19	2	cl	sa	
		19	1	cl	j	Old felt nearby
		20	1	cl	j	
		25	1	cl	a	
		27	1	cl	j	
		30	1	cl	a	
		30	1	gs	a	
		30	3	cl	2sa + 1j	Old felt nearby
		33	1	cl	sa	
		50	1	cl	j	
		55	1	cl	j	Old felt nearby
		57	3	cl	j	Old felt nearby
		58	1	cl	sa	Old felt nearby
		59	2	cl	sa	Old felt nearby
		59	1	cl	sa	
		60	1	cl	sa	
		62	1	cl	a	
		64	2	cl	a	Old felt nearby
		65	4	cl	1a +3sa	
		66	4	cl	1a +3sa	
		71	1	cl	sa	
		84	1	cl	sa	Old felt nearby
		97	3	cl	sa	
		232	1	cl	j	
		247	1	cl	j	
		252	1	gs	a	
		254	1	cl	a	
		254	1	cl	a	Old felt nearby
		255	1	cl	j	
		271	1	cl	j	
		832	3	cl	sa	
		835	1	cl	sa	
	Peninsula Centre	103	1	cl	a	
		104	3	cl	1a + 1sa + 1j	
		114	2	cl	1sa + 1j	
		397	1	cl	a	Old felt 10m W
		397	2	cl	1a + 1j	Old felt 5m E
		397	3	cl	a	Old felt 10m E
		398	3	cl	2a + 1j	Old felt nearby
		399	1	cl	a	Old felt 30m W
		399	1	cl	j	Old felt 30m W
		402	3	cl	2a + 1sa	Old felt nearby
		402	1	sm newt		Old felt nearby
		402	1	gs	a	Old felt 10m W S side of track
		406	1	cl	a	Old felt nearby
		406	2	cl	j	
		409	1	cl	j	
		409-410	1	cl	j	Old felt between
		411	1	cl	a	
		412	3	cl	1a + 2j	Old felt nearby
		414	1	cl	sa	
		417	3	cl	2a + 1sa	Old felt 50m S
		418	2	cl	a	Old felt 50m S
		420	1	cl	j	
		420	1	cl	j	Old felt 50m S
		420	1	cl	j	Old felt 100m S
		420	2	cl	1a + 1sa	Old felt on S edge of mound 130m S
		420	3	cl	2sa + 1j	Old felt on S edge of mound 130m S
		440	1	cl	a	
		472	1	cl	a	
		474	1	cl	a	
		486	1	cl	j	
		487	1	cl	j	
		492	1	cl	a	
		494	1	cl	j	Plywood nearby
		495	1	cl	j	Old felt nearby
		497	1	cl	j	
		536	2	cl	1a + 1j	
		551	1	cl	j	Old felt nearby
		553	2	cl	j	Old felt SW corner of compound
	Broadness	112	1	cl	sa	
		124	1	cl	j	
		125	1	cl	j	
		128	1	cl	a	
		132	1	cl	a	
		590	1	cl	sa	
24/09/2015 am	Manor Way	816	1	gs	sa	
		817	1	gs	sa	
		819	1	cl	a	
	Bamber Pit N	948	1	gs	sa	
	East Quarry	900	1	cl	sa	
		901	2	cl	1a +1sa	
		902	3	cl	1sa + 2j	
		905	2	cl	1a +1sa	
		908	1	cl	j	
		909	2	cl	sa	
		910	1	cl	a	
		911	1	cl	j	
		912	1	cl	j	
		914	1	cl	a	
		915	1	cl	sa	
		916	1	cl	j	
		931	1	cl	sa	
		932	1	cl	j	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
24/09/2015 pm	West Quarry	601	2	sw	a	
		601	3	cl	j	
		602	1	cl	sa	
		603	1	cl	j	Old felt nearby
		605	1	sw	j	
		617	1	cl	j	
		624	1	sw	a	
		631	1	cl	sa	
		632	2	sw	sa	Carpet tile nearby
		633	1	cl	j	Old tyre nearby
		634	1	sw	a	
		635	2	sw	1a +1sa	
		635	1	cl	a	Old felt 20m W
		635	1	sw	a	Old felt 40m W on bank to tunnel
		635	3	sw	1a + 1sa + 1j	Old felt 50m W on bank to tunnel
		636	1	sw	j	
		638	1	sw	j	
		639	1	cl	j	
		840	3	sw	a	
		840	2	cl	j	
		840	1	gs	j	
		841	1	sw	a	
		841	2	cl	a	
		843	1	cl	j	
		844	1	cl	j	
		844	2	sw	j	
		616-617	4	cl	1a + 2sa + 1j	
	CTRL W	853	1	cl	a	
		856	3	cl	sa	
25/09/2015 am	Bamber Pit S	766	2	gs	j	Old felts nearby
		770	1	cl	a	
		791	1	cl	sa	
		794	1	cl	sa	Old felt nearby
		847	1	sw	a	
		850	1	sw	sa	
	N of Springhd Nursery	688	1	cl	a	
		694	1	cl	sa	
		708	1	sw	sa	
		712	1	sw	sa	
		739	1	cl	a	
		754	1	cl	a	
28/09/2015 am-pm	Peninsula W	35	1	cl	a	
		38	1	cl	a	
		58	1	cl	a	
		60	1	cl	sa	
		64	1	cl	sa	
		65	1	cl	a	
		69	2	cl	sa	
		87	1	cl	a	
		226	1	cl	a	
		247	1	gs	j	
		831	1	cl	a	
		834	1	cl	a	
	Bamber Pit N	948	1	gs	a	
		950	1	cl	a	
		952	1	cl	a	
29/09/2015 am	N of Springhd Nursery	686	1	cl	a	
		697	1	cl	a	
		707	1	cl	a	Old felt nearby
		711	1	cl	a	
		715	1	sw	a	
		716	1	cl	a	
		737	1	cl	a	
		742	1	gs	j	
		748	1	cl	a	
		750	3	cl	2a + 1sa	
		751	2	cl	a	
29/09/2015 pm	Broadness	122	1	cl	sa	
		124	1	cl	a	
		126	1	cl	sa	
		136	1	cl	a	
		152	1	cl	sa	
		154	1	cl	sa	
		155	1	cl	j	
		338	1	cl	a	
		579	1	cl	a	
		584	1	cl	sa	
		599	1	cl	sa	
	East Quarry	909	2	cl	a	
		930	1	cl	j	
		932	1	cl	sa	
		934	1	cl	sa	
	Bamber Pit N	952	1	cl	sa	
	CTRL W	853	6	cl	a	
30/09/2015 am	East Quarry	900	4	cl	3sa + 1j	
		901	2	cl	a	
		902	1	cl	a	
		904	1	cl	sa	
		905	1	cl	sa	
		909	1	cl	sa	
		914	1	cl	sa	
		929		cl		Shed skin (tail)
		938	1	cl	sa	
	Bamber Pit N	950	1	cl	sa	
	Bamber Pit S	762	1	cl	sa	
		762	1	sm newt	j	Old felt nearby
		763	1	cl	a	Old felt 5m E
		763	1	gs	j	Old felt 5m S
		763	1	sw	a	Old felt 5m S
		764	1	sw	j	
		764	1	cl	a	Old felt nearby
		766	1	gs	j	Old felt 10m E
		766	1	cl	a	Old felt 10m E
		767	1	cl	a	Old felt nearby
		770	1	cl	j	
		770	1	cl	a	Old felt 5m W
		770	1	cl	sa	10m W
		771	1	cl	sa	Nr in grass
		772	2	cl	sa	
		775	1	cl	a	
		775	1	gs	j	Old felt 5m E
		776	1	cl	sa	Old felt 10m N
		776	1	cl	sa	Old felt 20m N
		776	1	cl	j	Old felt 25m NE
		777	1	cl	sa	Old felt nearby
		779	1	sw	a	
		779	1	cl	a	
		784	2	cl	1a + 1j	
		785	1	cl	a	Old felt 5m E
		785	1	gs	j	Old felt 5m E
		787	1	cl	j	Old felt 5m N
		787	2	cl	j	
		787	1	sw	a	
		791	1	cl	a	
		800	1	sw	a	
		806	1	sw	a	
		846	2	cl	1sa + 1j	
		849	1	cl	j	
		850	1	sw	a	

Date and time	Area	Heat trap	Number	Species	Life stage	Comments
30/09/2015 pm	Broadness	126	1	cl	sa	
		128	1	cl	a	
		129	1	cl	a	
		131	1	cl	a	
		152	1	cl	sa	
		155	1	cl	a	
		158	1	cl	a	
		338	1	cl	a	
		585	1	cl	sa	
	Manor Way	815	1	gs	a	
	West Quarry	616	1	cl	a	
		617	1	cl	a	
		618	1	cl	a	
		624	2	sw	a	
		635	2	sw	a	
		635	2	sw	a	Old felt 20m W
		636	1	cl	a	Old felt nearby
		637	1	sw	a	Old felt nearby
		638	3	sw	1sa + 2j	
		638	1	cl	sa	
		840	1	sw	a	
		844	3	sw	1sa + 2j	
		616-617	1	cl	a	Old felt between
	Northfleet Landfill	188	10	cl	2a + 6sa + 2j	
		192	1	cl	a	
		823	1	cl	sa	
01/10/2015 am	Peninsula Centre	105	1	cl	sa	
		114	1	cl	a	
		115	1	cl	a	
		118	1	cl	a	Old felt 20m S
		398	1	cl	j	Old felt nearby
		401	3	cl	sa	Old felt N side of track
		401	1	cl	sa	Old felt N side of track
		402	1	cl	j	Old felt nearby
		402	1	cl	a	Old felt nearby
		402	1	cl	a	Old felt 20m W
		406	1	cl	j	
		411	1	cl	a	
		411	1	cl	j	Old felt nearby
		412	1	gs	a	
		412	1	cl	sa	
		412	1	cl	j	Tin 20m S
		415	1	cl	a	Old felt 10m SE
		416	1	cl	sa	Old felt 20m S
		420	1	cl	a	Old felt 20m S
		420	1	cl	a	Old felt 50m S
		452	1	cl	a	Old felt 10m W
		458	1	cl	sa	
		458	1	cl	j	Old felt nearby
		459	1	cl	sa	
		495	1	cl	sa	Old felt 10m N
		497	1	cl	a	Old felt nearby
		512	1	cl	a	Old felt 10m E
		532 E	1	cl	a	Old felt 20m E
	Peninsula W	21	1	cl	a	
		32	1	cl	sa	
		59	1	cl	a	
		65	1	cl	a	
		69	1	cl	sa	
		93	1	cl	a	
		100	1	cl	a	
		226	1	cl	a	
		228	1	cl	sa	
		235	1	cl	a	
		238	1	cl	sa	
		247	1	gs	sa	
		254	1	cl	sa	
		834	1	cl	sa	
	NE Tip	655	1	cl	a	Old felt nearby
		657	1	cl	a	
01/10/2015 pm	East Quarry	902	1	cl	sa	
		908	1	cl	j	
		909	1	cl	sa	
		917	1	cl	j	
		927	1	cl	a	
		932	1	cl	sa	
		936	1	cl	j	
		940	1	cl	j	
		942	2	cl	j	
	Bamber Pit N	948	1	gs	j	
		952	1	cl	sa	
08/10/2015 am	East Quarry	942	2	cl	sa	
	Bamber Pit N	950	1	cl	sa	
08/10/2015 pm	N of Springhd Nursery	681	1	cl	j	
		682	3	cl	sa	
		694	1	cl	a	
		695	2	cl	sa	
		700	1	cl	j	
		705	1	cl	a	
		706	1	cl	sa	
		711	1	cl	a	
		712	1	gs	sa	
		712	5	cl	3sa + 2j	
		714	1	cl	a	
		720	1	cl	j	
		721	1	gs	j	
		724	6	cl	j	
		734	1	cl	sa	
		737	4	cl	2a + 2sa	
		751	2	cl	1a + 1sa	
		755	1	cl	sa	
		757	1	cl	j	

Table 5 Species recorded by survey area

Area	cl	sw	gs
Peninsula	✓	✓	✓
Botany Marsh East			✓
Manor Way	✓		✓
West Quarry	✓	✓	✓
East Quarry	✓		
Bamber Pit N	✓	✓	✓
Bamber Pit S	✓	✓	✓
Northfleet Landfill	✓	✓	✓
CTRL W	✓		
N of Springhd Nursery	✓	✓	✓

Table 6 Survey summary - number of individuals and adults recorded by area and species (excluding areas with no records)

Spring/early summer		cl		sw		gs	
Date and time	**Area**	**All**	**Adults**	**All**	**Adults**	**All**	**Adults**
16/04/2015 am	West Quarry	2	1	9	5		
	Bamber South	5	3	7	5	3	**3**
	Northfleet Landfill	3	3				
	N of Springhd Nursery	6	3				
20/04/2015 am	Peninsula	12	11				1
	Botany Marsh East					1	**1**
20/04/2015 pm	West Quarry	1	1		2		
	Bamber South	6	4	4	4		
	Northfleet Landfill	1				1	**1**
	N of Springhd Nursery	16	8				
24/04/2015 am	Manor Way	1	**1**				
	West Quarry	1		9	6		
	Bamber South	9	3	13	5		
	Northfleet Landfill	6	4			1	**1**
	N of Springhd Nursery	8	8	1			
24/04/2015 pm	Peninsula	30	27	1	**1**	2	2
28/04/2015 am	Peninsula	15	15			3	3
11/05/2015 pm	Peninsula	28	24			6	3
	West Quarry	2	1	6	3		
	Bamber South	14	13	4	1	2	
	Northfleet Landfill	4	2			1	
	N of Springhd Nursery	8	8	2			
15/05/2015 am	Peninsula	18	13			2	2
	West Quarry			7	2		
	Bamber South	27	**14**			2	1
	Northfleet Landfill	3	3				
	N of Springhd Nursery	19	**11**			4	
19/05/2015 am	Peninsula	17	12			6	4
	West Quarry	4	1	4	2		
	Bamber South	24	9				
	Northfleet Landfill	1	1			2	
	N of Springhd Nursery					1	
21/05/2015 am	Peninsula	12	10				1
	West Quarry	1	1	9	4		
	Bamber South	9	6	9	7		1
	N of Springhd Nursery	19	**11**			7	**1**
26/05/2015 pm	Peninsula	6	6			4	2
	West Quarry	2	2	11	3		
	Bamber South	7	3			1	
	Northfleet Landfill	7	7				
	N of Springhd Nursery	6	3			1	
01/06/2015 am	Peninsula	22	16				1
04/06/2015 am	West Quarry	1	1	2	2		
	Bamber South	5	5	11	**7**		
	Northfleet Landfill					3	**1**
	N of Springhd Nursery	3	3	6	**3**	1	
08/06/2015 pm	Peninsula	39	29			12	**6**
	Manor Way	1	**1**				
	West Quarry	6	3	17	7		
	Bamber South	7	4	4	1		
	Northfleet Landfill	1				1	
	N of Springhd Nursery	11	9	5	**3**	1	
11/06/2015 am	Peninsula	4	3			5	3
	West Quarry	2	2	5	2		
	Bamber South	2	2	2	2	1	1
	N of Springhd Nursery	1	1	4	**3**	2	
15/06/2015 am	Peninsula	11	5			6	4
	West Quarry			25	**13**		
	Bamber South	5	3	2	2		
	N of Springhd Nursery			3	2		
	Peak counts (adults only)						

Autumn		cl		sw		gs	
Date and time	**Area**	**All**	**Adults**	**All**	**Adults**	**All**	**Adults**
02/09/2015 pm	East Quarry	1	1				
14/09/2015 am	NE Tip	3	**3**				
14/09/2015 pm	Broadness	14	**10**				
22/09/2015 pm	Broadness	7	5				
23/09/2015 am	East Quarry	2	2				
	Bamber South	9	3	4	4	5	
23/09/2015 pm	Peninsula West	52	**11**			2	**2**
	Peninsula Centre	57	23			1	**1**
	Broadness	6	2				
24/09/2015 am	Manor Way	1	**1**			2	
	Bamber North					1	
	East Quarry	19	**4**				
24/09/2015 pm	West Quarry	20	4	20	9	1	
	CTRL West	4	1				
25/09/2015 am	Bamber South	3	1	2	1	1	
	N of Springhd Nursery	4	3	2			
28/09/2015 am-pm	Peninsula West	12	8			1	
	Bamber North	2	2			1	**1**
29/09/2015 am	N of Springhd Nursery	12	10	1	1	1	
29/09/2015 pm	Broadness	11	4				
	East Quarry	5	2				
	Bamber North	1					
	CTRL West	6	**6**				
30/09/2015 am	East Quarry	12	2				
	Bamber North	1					
	Bamber South	27	10	7	6	4	
30/09/2015 pm	Broadness	9	6				
	Manor Way					1	**1**
	West Quarry	6	**5**	14	8		
	Northfleet Landfill	12	3				
01/10/2015 am	Peninsula Centre	29	13			1	**1**
	Broadness	15	7				
	NE Tip	2	2				
01/10/2015 pm	East Quarry	10	1				
	Bamber North	1				1	
08/10/2015 am	East Quarry	2					
	Bamber North	1					
08/10/2015 pm	N of Springhd Nursery	34	7			2	
	Peak counts (adults only) for each survey area						

Spring 2016		cl		sw		gs	
Date and time	**Area**	**All**	**Adults**	**All**	**Adults**	**All**	**Adults**
27/04/16 pm	Broadness	1	1				
	Bamber North			1	1		
	Northfleet Landfill	1		1	1	1	1
	CTRL West	1					
28/04/2016 am	Peninsula West	3	3			1	1
	Peninsula Centre	8	5				
	NE Tip	1					
06/05/2016 am	Peninsula West					2	
	Peninsula Centre	5	2				
	Broadness	3	3				
13/05/2016 am	Peninsula Centre	6	4				
	Bamber North			2	1		
	Northfleet Landfill	1	1				
16/05/2016 pm	East Quarry	2	1				
	Bamber North	1		1	1	2	
19/05/2016 pm	East Quarry	4	4				
	Bamber North	4	**3**	2	**2**	4	
20/05/2016 pm	East Quarry	7	**6**				
	Bamber North	4	2	1	1	4	
	Northfleet Landfill	17	**11**				
23/05/2016 pm	Peninsula West	17	9*			4	
	Peninsula Centre	40	**34***			5	1
	Broadness	7	6*			1	
	East Quarry	3	3				
	Bamber North	2	2	3	**2**	4	
27/05/2016 am	Bamber North	2	2			5	
	CTRL West	1	1				
	Peak counts (adults only) for each survey area						

*49 cl for whole Peninsula (West + Centre + Broadness)

Table 7 Peak counts (adults)

Area	cl	sw	gs
Peninsula W	11		2
Peninsula Centre	34		1
Broadness	10		
Peninsula	36	1	6
Manor Way	1		1
West Quarry	5	13	
East Quarry	6		
Bamber North	3	2	1
Bamber South	14	7	3
Northfleet Landfill	11		1
CTRL West	6		
N of Springhd Nursery	11	3	1

Table 8 Population size class, assemblage score and qualifying Key Reptile Sites*

Area	cl	sw	gs	No. spp.	Score	Key Reptile Site	Qualifying criteria
Peninsula W	Good		Low	2	3		
Peninsula Centre	Exceptional		Low	2	4	✓	3 + 4
Broadness	Good			2	2		
Peninsula	Exceptional	Low	Good	3	6	✓	1 + 3 + 4
Manor Way	Low		Low	2	2		
West Quarry	Good	Good		3	4	✓	1 + 4
East Quarry	Good			1	2		
Bamber North	Low	Low	Low	2	3	✓	1
Bamber South	Good	Good	Low	3	5	✓	1 + 4
Northfleet Landfill	Good		Low	2	3		
CTRL West	Good			1	2		
N of Springhd Nursery	Good	Low	Low	3	4	✓	1 + 4

* Based on - Froglife, 1999. Froglife Advice Sheet 10: Reptile Survey

Key Reptile Site - qualifying criteria
1. Supports 3 or more reptile species
2. Supports 2 snake species
3. Supports an exceptional population of one species
4. Supports an assemblage of species scoring at least 4

FIGURES

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KEY

346 Heat Trap (2015 & 2016 survey)

366a Heat Trap (additional for 2016 survey)

306 Heat Trap (traps relocated after 2015 survey and repositioned for 2016 survey)

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LONDON RESORT COMPANY HOLDINGS

FIGURE 1a
SURVEY AREAS AND HEAT TRAPS

August 2016
11120202_Reptile Report_08-16.indd

KEY

346 Heat Trap

0 50 100 Metres

N

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FIGURE 1b
SURVEY AREAS AND HEAT TRAPS

August 2016

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KEY

346 Heat Trap (2015 & 2016 survey)

414 Heat Trap (additional for 2016 survey)

0 50 100 Metres

N

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FIGURE 1c
SURVEY AREAS AND HEAT TRAPS

August 2016
11120202_Reptile Report_08-16.indd

KEY

346 Heat Trap

0 50 100 Metres

N

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FIGURE 1d
SURVEY AREAS AND HEAT TRAPS

August 2016

KEY

346 Heat Trap

0 50 100 Metres

N

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FIGURE 1e
SURVEY AREAS AND HEAT TRAPS

August 2016
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KEY

346 Heat Trap (2015 & 2016 survey)

345a Heat Trap (additional for 2016 survey)

0 50 100 Metres

N

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FIGURE 1f
SURVEY AREAS AND HEAT TRAPS

August 2016

KEY

346 Heat Trap

0 50 100 Metres

N

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FIGURE 1g
SURVEY AREAS AND HEAT TRAPS

August 2016
11120202_Reptile Report_08-16.indd

KEY

346 Heat Trap (2015 & 2016 survey)

870b Heat Trap (additional for 2016 survey)

0 50 100 Metres

N

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FIGURE 1h
SURVEY AREAS AND HEAT TRAPS

KEY

346 Heat Trap

0 50 100 Metres

N

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FIGURE 1i
SURVEY AREAS AND HEAT TRAPS

August 2016

Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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FIGURE 2a
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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FIGURE 2b
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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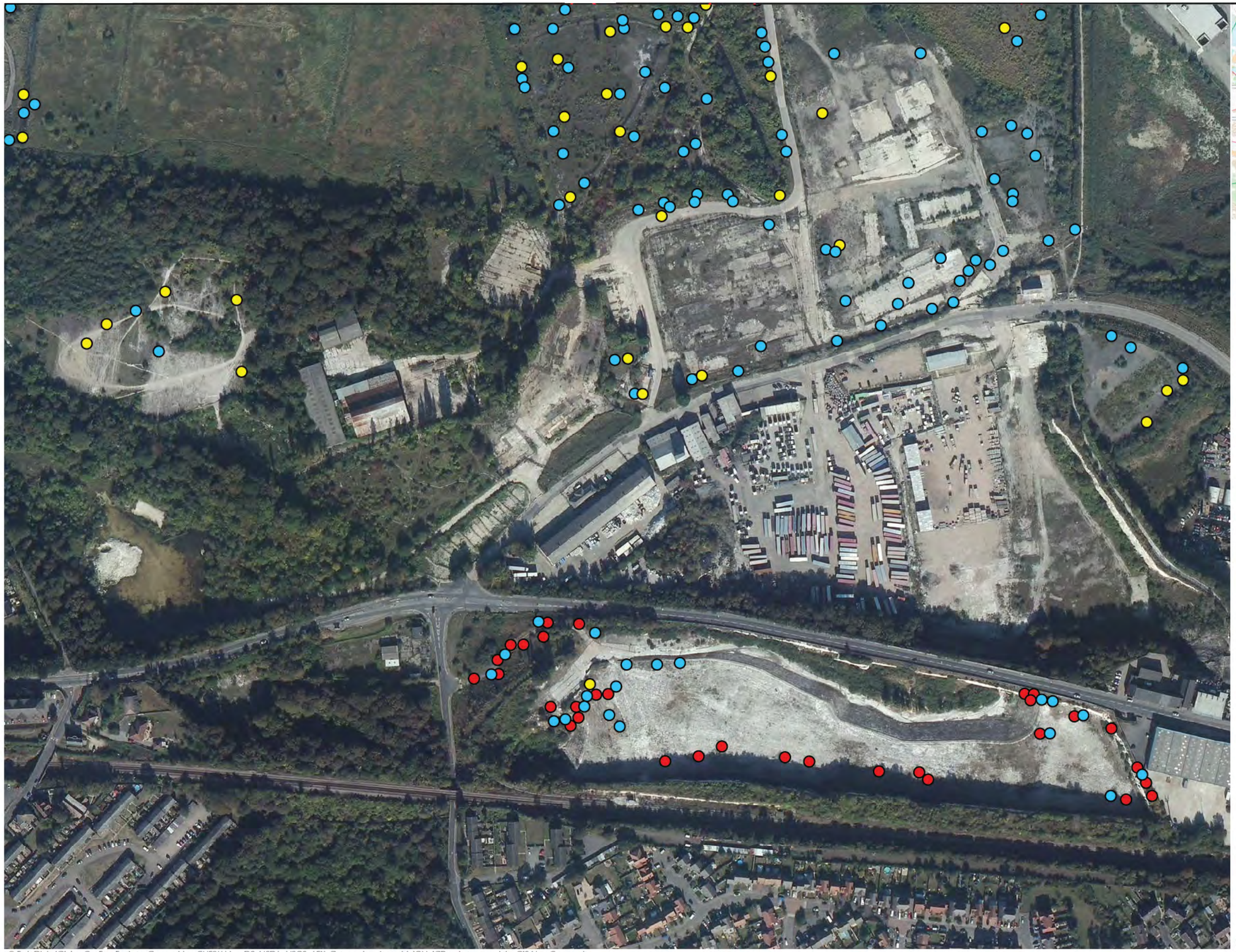
FIGURE 2c
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd



Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

N

0 50 100 Metres

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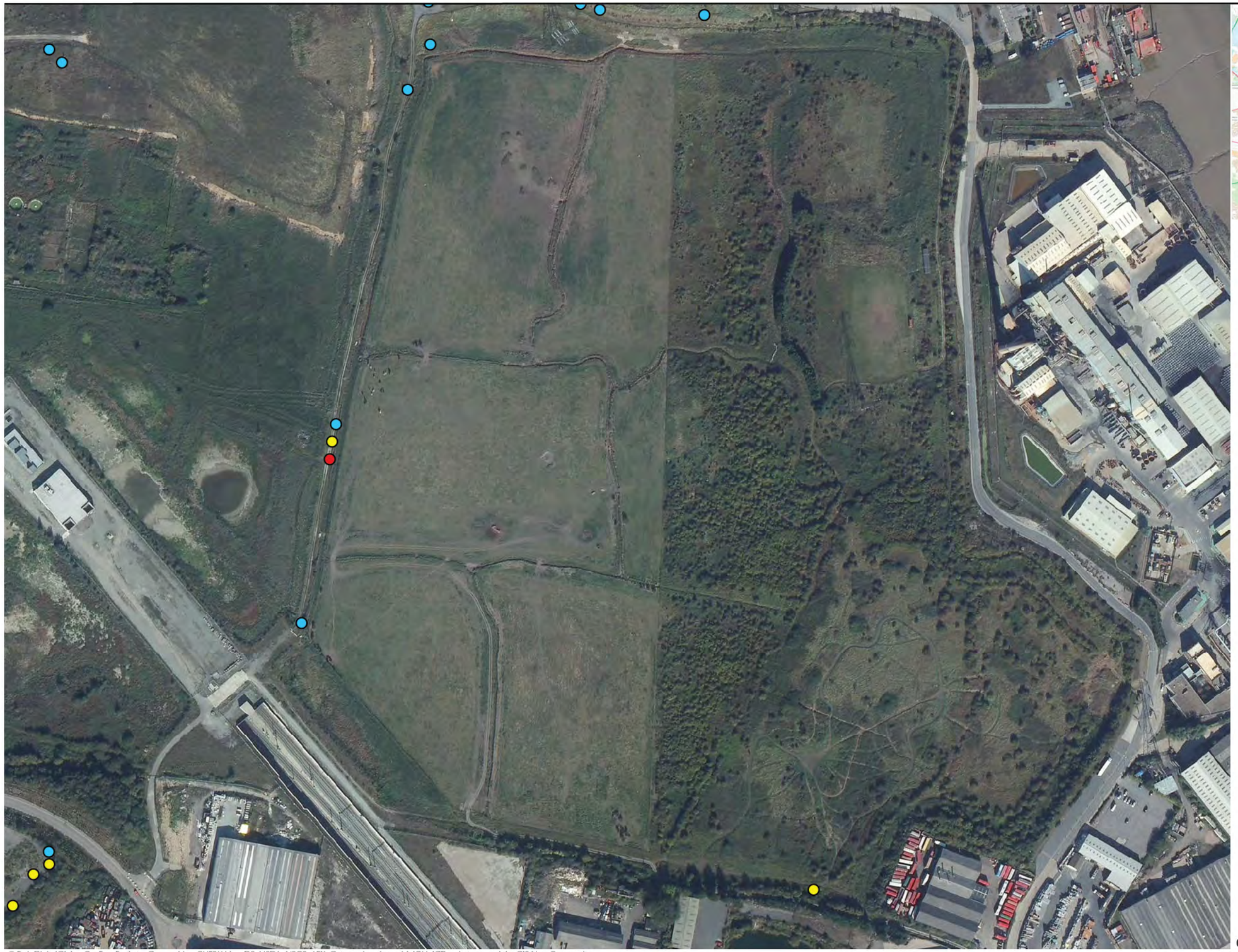
FIGURE 2d
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd



Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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LONDON RESORT COMPANY HOLDINGS

FIGURE 2e
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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LONDON RESORT COMPANY HOLDINGS

FIGURE 2f
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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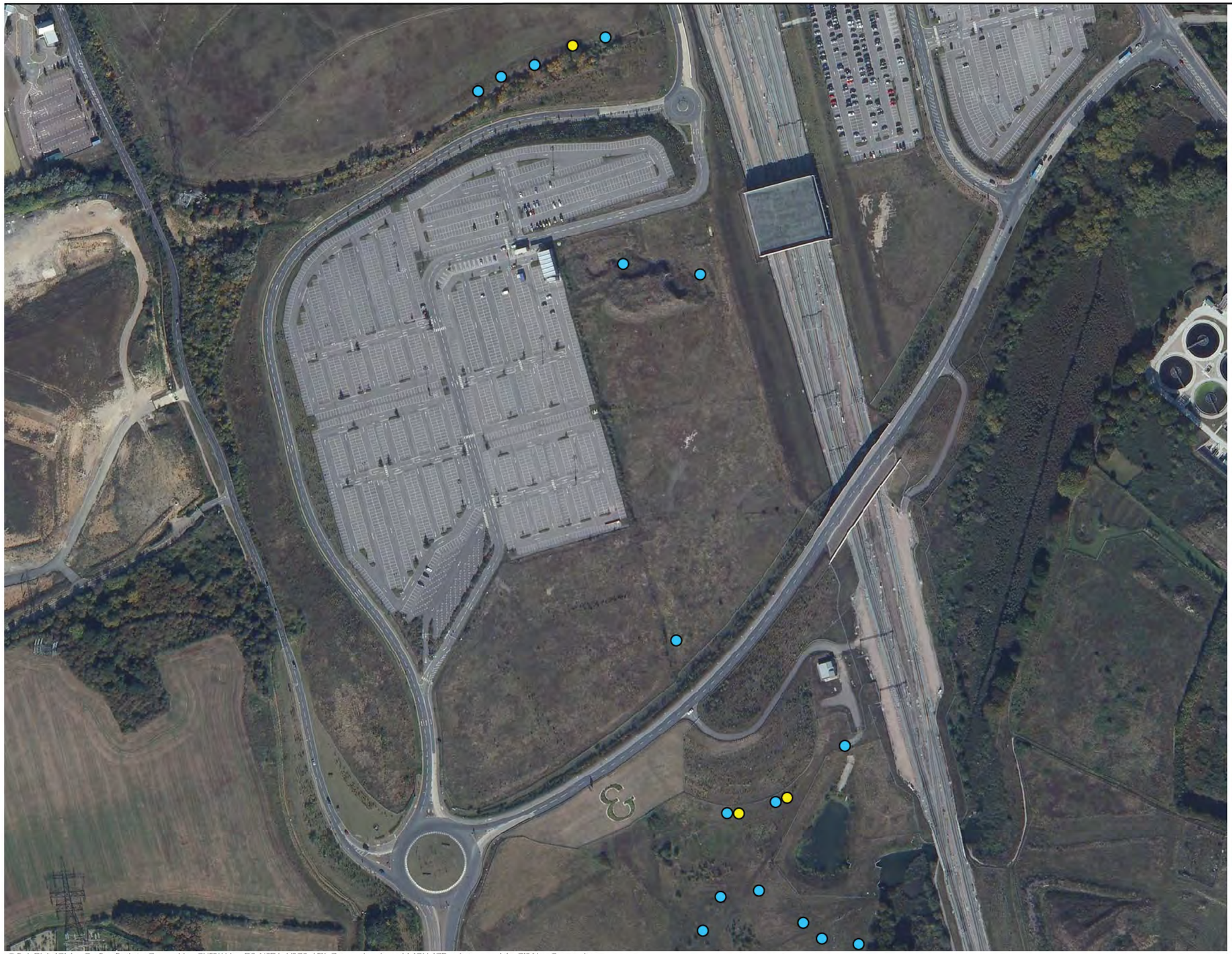
FIGURE 2g
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd



Survey Records:

- Common Lizard
- Grass Snake
- Slow Worm

0 50 100 Metres

N

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LONDON PARAMOUNT ENTERTAINMENT RESORT
LONDON RESORT COMPANY HOLDINGS

FIGURE 2h
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

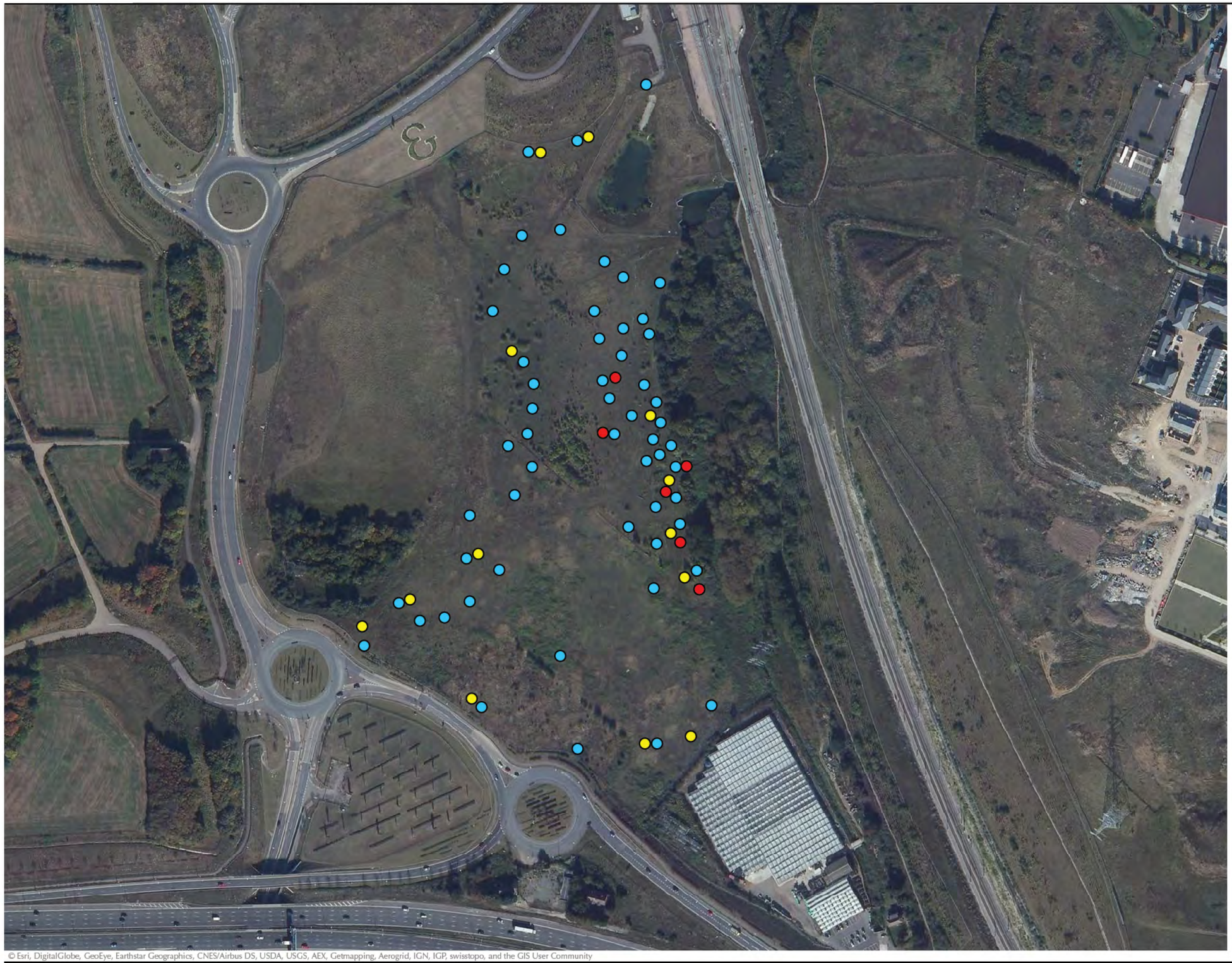

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FIGURE 2i
LOCATION OF REPTILE RECORDS

August 2016
11120202_Reptile Report_08-16.indd

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Annex EDP 27
2012 Terrestrial Invertebrate Survey Report (CBA, 2012)

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London Resort Company Holdings
(LRCH) Ltd.

London Paramount

2012 Terrestrial Invertebrate Survey Report

October 2012

CHRIS BLANDFORD ASSOCIATES
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London Resort Company Holdings
(LRCH) Ltd.

London Paramount

2012 Terrestrial Invertebrate Survey Report

Approved	[redacted]
	Bill Wadsworth
Position	Senior Associate (Ecology)
Date	31st October 2012
Revision	FINAL

CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings (LRCH) Ltd. to undertake a series of ecological surveys to inform the Environmental Impact Assessment for the proposed London Paramount development at Swanscombe, North Kent. This report details the results of the terrestrial invertebrate surveys undertaken between March and September 2012.

1.2 Aims

1.2.1 The aims of the survey were to identify and evaluate the the invertebrate species and communities present that could potentially be affected by the proposed development.

1.3 The Site

1.3.1 The proposed development site occupies an area that runs from the current industrial units at Manor Way, Swanscombe, northwards to the Thames, in grid squares TQ6075 and TQ6076. The terrestrial invertebrate survey brief included a survey and comparison of this area with an area to the west in grid square TQ5975, running along the recently re-profiled sea wall.

1.3.2 For the purposes of this survey, the proposed development area was divided into a northern section (bounded by the access track to the small boat yard on the edge of the Thames) and a southern section. These areas were called Swanscombe North (allocated grid TQ605765) and Swanscombe South (allocated grid TQ605760). In addition the 'comparison area' was called Swanscombe West (allocated grid TQ597755) - see **Figure 1.**

1.3.3 Parts of the proposed development site have been quarried for chalk for the cement works in the past, and considerable parts of the quarried and marsh areas central to the Swanscombe Peninsula have been tipped with fly ash.

1.3.4 A large area of Swanscombe South appears to have been used for washing out mobile cement mixers and the drainage here is rather impeded. A considerable proportion of the rest of Swanscombe South was fenced off and hence not accessed for the survey.

1.3.5 It was considered that the readily accessible sections would supply enough data for overall assessment of the site without the additional constraint of getting access and, possibly, escort for the fenced-off areas. There would not have been enough time on survey rounds to visit all areas thoroughly in any case and a degree of selectivity over site selection at each visit was inevitable.

1.3.6 The sea-wall has fairly recently been re-aligned and heightened. Only a small amount of fly ash had been tipped on the marshes on this western side, and, apart from the lack of grazing (they are now very isolated from any other farmland and rather small) these must provide a fairly good representation of the original condition of the Swanscombe Marshes peninsula.

1.3.7 The division between Swanscombe North and Swanscombe South was decided in order to assess whether a significant proportion of species were unique to either area, with Swanscombe West as a control for the wider fauna of the area. This information would be of importance in informing decisions regarding likely enhancement areas for the conservation of the faunal interest of the site.

1.3.8 Additional areas in the overall extent of interest for the proposed developement have been previously surveyed as part of the decommissioning of the Cement Works (Northfleet Cement

Works 2008, Baker Shepherd Gillespie). Whilst no direct comparison of these areas was made as part of the current survey it would be possible to do this with the agreement of the commissioning parties. The areas of highest entomological interest in this context are shown on **Figure 1** as well as the three survey areas for the current project.

2.0 METHODOLOGY

2.4.1 The survey was undertaken by invertebrate specialists Mike Edwards (Edwards Ecological Services Ltd.) and Peter Hodge.

2.4.2 Mike Edwards focused on surveying Hymenoptera aculeata (Ants, Bees and Wasps); some Diptera groups - Bibionidae (St Mark's Flies), Larger Brachycera (Robberflies and allies), Syrphidae (Hoverflies); Sciomyzidae (Snail-killing Flies) and Tipulidae (Craneflies); Orthoptera (Grasshoppers and Crickets).

2.4.3 Peter Hodge focused on surveying Hemiptera-homoptera (Hopper bugs only); Hemiptera-heteroptera (Bugs); Coleoptera (Beetles); Lepidoptera (Butterflies and Moths - day-flying groups only); some Diptera (Empididiae, Dolichopidae, Tephritidae (Picture-wing Flies).

2.4.4 Species from other insect groups were recorded as seen and recognised.

2.4.5 Survey visits took place in good recording conditions on the following seven occasions:

- 23/3/2012 (ME only)
- 11/04/2012; 15/06/2012; 27/06/2012; 23/07/2012; 14/08/2012; 21/09/2012 (ME and PH)

2.4.6 No visit was made during May as the weather conditions were not suitable in this month; appropriate seasonal coverage was obtained by undertaking visits early and late June.

2.4.7 Insects were recorded by a mix of direct observation and sweep netting. Voucher specimens of rare or difficult to distinguish species were retained for subsequent examination/confirmation in the laboratory.

2.4.8 As already noted, time constraints meant that sampling had to be selective on each visit. Swanscombe West was consistently surveyed on each occasion, with a two-hour sample being taken each afternoon. Effort was concentrated in Swanscombe North or South during alternate visits, with approximately 2.5 and 1 hour morning searches on each section per visit. Suction samples were taken in suitable locations over all the sample areas in June and September, the data from these samples has been combined with the rest of the samples. No water samples were taken for aquatic insects, although some insects with aquatic associations were recorded in the general samples.

3.0 RESULTS

3.1 Swanscombe North

3.1.1 This area is shown in more detail in **Figure 2**, where it can be seen to be of approximately equal area to Swanscombe South. The majority of both of these areas was old fly ash tip with some ditches/open water fringed by stands of Common Reed *Phragmites australis*. There is a narrow border of saltmarsh vegetation along the boundary with the River Thames. Considerable seepage of yellowish effluent from the tipping is present in both fresh and brackish situations.

3.1.2 Small areas where soil had been moved about subsequent to the main tipping (**Image 1**) and/or where gentle disturbance due to walkers forming paths (**Image 2**) were of high significance for both aculeate Hymenoptera and phytophagous Coleoptera. This was due to both the creation of areas of bare and re-vegetating ground as a physical feature, and to the presence of a diverse flora associated with these areas. Suction samples were taken on these patches.

3.1.3 Much of the fly ash infill was covered in mature, dense, tall grassland with fairly mature scrub growth. Some areas had clearly had scrub removed in the fairly recent past as the bushes were uniformly shorter, probably by the simple expedient of bull-dozing, and not for conservation-minded purposes (**Images 3, 4 ,5**). These areas were, likewise, much richer in plants and insects than the older, less disturbed grasslands.

3.1.4 The reed-fringed edges of the water-courses here were swept on survey visits but were of little interest, possibly because the water quality itself looked to be very low. One interesting species was discovered by careful inspection of the old cigar galls on the reed stems, the yellow-faced bee *Hylaeus pectoralis*.

Image 1 A small area at the north-western end of Swanscombe North. Here spoil from elsewhere had been recently moved about, providing good nest sites for aculeates and forage resources for both these insects and phytophagous Coleoptera.

Image 2 Similar processes of intermittent disturbances, this time provided by passing walkers and push-bikes along the Thamesside path, also provided good habitat for aculeate Hymenoptera and phytophagous Coleoptera.

3.1.5 The female of this bee hollows out the old larval chamber caused in the flowering stem of reed by the gall-forming fly *Lipara lucens* and uses this as a nest chamber. It can therefore only use reed stems which are more than one year old. Originally thought to be confined to the Broads, it has proved to be more widespread, although a strict wetland habitat specialist. Although not recorded in Swanscombe West it is likely to be present here too.

3.1.6 The other wetland habitat present, that of the brackish saltmarsh, notably around the small creek, also had a number of specialist insects associated with it, despite its small area and the poor quality of parts of it, probably due to seepage from the tipping. These included the BAP mining bee *Colletes halophilus* which collects its pollen exclusively from the flowers of Sea Aster *Aster tripolium* and is only found along the coasts of the English Channel in the whole world (**Image 6**). This bee nests in small areas of dry bare ground close to its food plant. The bee was also found in the Swanscombe South and West samples.

Image 3 Tall grassland with maturing scrub, fairly typical of much of the old Fly Ash tip.

Image 4 Intermittent disturbances of the grassland provided more diversity of ecological niche. This strip alongside one of the trackways had probably been bull-dozed for some reason in the fairly recent past. It is unlikely that cutting alone would have made the differences seen here.

Image 5 This area was occasionally flooded as evidenced by the water held on it after some of the heavy summer rain of 2012. Part of it had also been burnt the year before.

Image 6 The mining bee *Colletes halophilus* at its only pollen source, the flowers of Sea Aster.

3.1.7 Another saltmarsh specialist found here was the large soldier fly *Stratiomys singularior* (**Image 7**), whose larva live in the wet mud and small pools of the saltmarsh and associated ditches. Although only recorded in this sample area it might reasonably be expected in Swanscombe West as well.

Image 7 *Stratiomys singularior* is a large and fairly arresting soldier fly associated with saltmarsh and brackish ditches.

3.2 Swanscombe South

3.2.1 As noted above, a considerable part of Swanscombe South was fenced off, whilst the most extreme southern section, around the exit point for the Cross-Channel Rail Link, was extensive wet reedbed. Access to both these areas was not straightforward and they were not surveyed.

3.2.2 This left a roughly equivalent area of similar composition to be compared with the Swanscombe North area in order to establish whether there were likely to be major differences in faunal composition between Swanscombe North (more likely to be suitable for use as a habitat enhancement area) and the rest of the site, which has been proposed for development. **Image 8** gives an overall view of the mature grassland and wetland components and **Image 9** the more skeletal component.

3.2.3 This skeletal area was initially expected to be of high value for a range of aculeate Hymenoptera and phytophagous beetles similar to those found in what appeared to be similar situations in the Swanscombe North sample. However despite careful searches and suction sampling, the area did not appear to be of high value for these invertebrate groups. This may be explained by flooding, which occured after a spell of very heavy rain in the middle of the survey period and lasted for several weeks.

3.2.4 What was initially considered to be a layer of bare, if rather hard, chalk left after quarrying activity was not this at all, but probably the residues from washing out ready-mix cement mixers. The clue was present all along with the presence of a number of small areas of open water in this area, something which would have been extremely unlikely on mineral chalk, unless at the water-table, which it clearly was not.

Image 8 Much of Swanscombe South was tall mature grassland, with small ditches and bodies of open water fringed by reeds.

Image 9 A large area on the western edge of the sample zone was of a much more skeletal structure where, it appears, Readymix cement mixers had been washed out, creating a layer of fairly impervious chalky material.

3.2.5 The main interest of this area was along the edges where occasional disturbances had, as elsewhere on site, encouraged the development of a legume-rich sward, including stands of Kidney Vetch *Anthyllis vulneraria* (**Image 10**), Red Clover *Trifolium pratense* and Meadow Vetchling *Lathyrus pratensis*. These plants were well visited by a number of bee species, including frequently by the BAP bumblebee *Bombus humilis* (**Image 11**). As on other nearby sites the Bumblebee *Bombus sylvarum* was not present, this species now seems to be limited in the Thames Estuary to areas east of Tilbury.

3.2.6 The other, smaller, areas of bare and re-vegetating ground, mainly along trackways did prove to hold a similar fauna to the North Swanscombe sample. Interesting examples of this fauna include the weevil *Sibinia arenariae* (**Image 12**), found under plants of Sea Spurrey *Spergularia* spp. growing along the trackway being sampled with a suction sampler in **Image 13**. This weevil was not recorded in either of the other compartments, but is considered likely to be present if enough plants were to be searched.

Image 10 The more broken-up edges of this area supported good stands of legumes, such as this Kidney Vetch, which was popular with queens of the bumblebee in **Image 11.**

Image 11 The bumblebee *Bombus humilis*.

Image 12 The tiny weevil *Sibina arenariae* was found by searching the ground under one of its food plants, Sea Spurrey. This plant was growing along the trackway being suction-sampled in **Image 13.**

Image 13 Using a suction sampler to help find small insects in short vegetation. This technique is much more time-efficient for recording small beetles and bugs than hand-searching. However, as with *Sibina arenariae* in **Image 12,** it is worth doing both techniques during a survey.

3.2.7 Another insect found associated with these areas in all sample areas was the potter wasp *Odynerus melanocephalus*, another BAP species. **Image 14** shows a female wasp at the mud tower typical of this species and carrying a small green larva of the weevil *Hypera postica*, which is the prey of this species. The weevil is also associated with these areas of fairly sparse vegetation as it feeds on trefoils and medicks growing in them.

3.2.8 There was no saltmarsh component to this sample area and the margins of the ditches produced little of note beyond a nest of the yellow-faced bee *Hylaeus pectoralis* (see 3.1.5).

3.3 Swanscombe West

3.3.1 This area (**Figure 3**) was not under consideration for development at the time of survey, but was included both to provide some idea of where species recorded in the other areas were as well and to provide some information regarding the likely value of similar river defence/management works as potential enhancement areas for the overall site.

Image 14 This potter wasp *Odynerus melanocephalus*, which was found nesting on all three sample areas, is much better than us at finding its particular prey, the larvae of the weevil *Hypera postica*. The paralysed prey (green) can just be seen being carried into the low mud 'chimney' at the entrance to the wasp's nest.

3.3.2 The area had examples of all the broad habitat types present in the North and South samples, some of which were being maintained by deliberate management strategies, and others which were examples of incidental, but very valuable, consequences of previous use. The components and their location is indicated on **Figure 3**.

3.3.3 In this later category comes, almost inevitably, the skeletal vegetation component which is so important in the rest of the site. This is not surprising as most management outcomes are aimed at a 'complete' end point - a wood or permanent grassland perhaps. The skeletal vegetation structure, with its matrix of bare ground and intermittent vegetation is, in these terms, an incomplete outcome going towards somewhere and requires a rather different approach to its maintenance.This point will be returned to in section 4 of this Report which suggests some ideas for mitigation management strategies.

3.3.4 The main area with this component was on the approach to the old wharf (**Image 15)**, although there was also a small area of fairly recently tipped, or re-distributed, fly ash on the landward side of the road at the eastern end of this sample area (**Image 16**). This latter area provides a good example of a fairly recently disturbed area which is approaching the point at which some further disturbance would be required to re-start the important successional process.

Image 15 This area of well-drained, skeletal vegetation is typical of several areas on the overall survey area. It owes its physical structure to the lumpy, rubble-like material which had been put here, probably to aid loading movements associated with the wharf, but elsewhere as an unintended consequence of industrial use. Such areas are very warm and usually well-drained (although sub-surface compaction can alter this) with an invertebrate fauna more often found associated with sand-dune systems.

Image 16 Also with an unintended ecological consequence of industrial use, the pulverised fly ash which has been tipped here is often rather less well-drained, but also has physical and chemical properties more often associated with sand dune systems. Ironically, this 'industrial waste', often dumped on top of wet grazing marsh, has provided excellent invertebrate habitat in several places along the Thames - of a completely different nature than the original habitat and owing much of its interest to the insects originally associated with the gravel terraces to the north of the river- now largely quarried away.

3.3.5 The fauna recorded here was similar to that found on this sort of habitat component elsewhere on site.

3.3.6 The saltmarsh component was larger here than on the Swanscombe North area and without modification through effluent from fly-ash tipping (**Image 17**). It held a number of important saltmarsh insects and is of high value as a remnant of a formerly much more widespread component of the tidal/brackish Thames in London, despite its small size. These include the mining bee *Colletes halophilus* (see 3.1.6), the weevil *Mecinus collaris* which make a gall in the flower head of Sea Plantain *Plantago maritima* and the plant hoppers *Aphrodes aestuarinus* and *A. aestuarius*, both of which are associated with Shrubby Seablite *Suaeda maritima*.

3.3.7 The old sea-wall had been left after the (re?)building of the new wall and a, low-lying area of occasionally inundated grassland and incipient reed bed now lies between the two walls (**Image 18**). Both this area and the grasslands of the re-profiled sea wall were being managed on a cyclical cutting basis (**Images 18, 19, 20, 21**).

3.3.8 The outcome of this has been an overall good continuity of forage resources for associated insects and a varied plant community. Most of the insects associated with the grasslands on all the sample sites were recorded on these grasslands too. This area provides a good example of part of an overall management enhancement strategy for the entire site.

Image 17 The saltmarsh component, although not large in extent, still held a good representation of typical saltmarsh species.

Image 18 The occasionally inundated grassland lying between the old and new sea walls. Image taken in August. Note the highly floriferous grassland.

Image 19 The same area as in **Image 18** after cutting in June. Not all the grassland had been cut at the same time however- as shown in **Images 20** and **21** below.

Image 20 An area of longer grassland left on the sea wall. This has maintained forage resources for a wide variety of insects, whilst also meeting wider management constraints.

Image 21 An area of longer grassland left on the sea wall. This has maintained forage resources for a wide variety of insects, whilst also meeting wider management constraints.

4.0 EVALUATION

4.1 Habitats

4.1.1 Part of the site was originally a chalk outcrop which has been quarried away for making cement. In places the chalk bedrock is still present, making a well-drained, calcareous skeletal substrate. Most of the area, however, is more recent than this chalk, being derived from the extensive tipping of pulverised fly ash (PVA) on former grazing marsh during the latter part of the last century. This in-filing has, in most areas, brought the land surface well above the natural water level and has given rise to a generally well-drained, calcareous soil. This is often droughted, although subsequent compaction or addition of cement wastes have made some areas more liable to retain local surface water.

4.1.2 As the site was filled different areas would have been disturbed in turn as the overall level was increased. This disturbance served to rotationally create areas of re-colonising grassland, with plenty of open spaces - an analogue of the calcareous grassland developed on deeper soils such as those on much of Salisbury Plain Training Area (especially where light tank training has been carried out) or some of the upper sections of the North and South Downs. These taller grasslands are different in structure and composition to the short turf which develops, especially under hard grazing pressure, on areas of exposed chalk bedrock or steep slopes on chalk and, whilst sharing many of the same species, are different in their overall invertebrate fauna.

4.1.3 Succession to scrub and woodland is retarded by the droughted nature and low-nutrient status of the substrate. The regular, cyclical disturbance has had a further restricting influence - this is probably what happened relatively recently in the areas shown in **Images 4** and **16**. This sort of fairly dramatic, cyclical re-profiling of the habitat is of high value for invertebrates.

4.1.4 More recently the management of the grassland along the re-built sea wall on Swanscombe West gives an excellent example of the sort of cyclical mowing regime which helps maintain a plant-rich sward (**Photos 18-20**), although this could be enhanced through the removal of the arisings.

4.1.5 Swanscombe North (**Figure 1**) is of particular note as it holds a very wide representation of the fauna present and, importantly, serves to also buffer the small but significant river-side salt-marsh habitats.

4.2 Species

4.2.1 The total number of species recorded, by sample area and recognised conservation significance are presented in **Table 1**.

4.2.2 The individual species listed as being of conservation significance and an evaluation of this significance at a regional and national level forms **Table 2**.

Table 1 Total Number of Species Recorded on Site

Sample Area	Total No. Species	No. Species Considered Significiant	No. Species Unique to that Area	No. Species Considered Significiant
All areas	479	80	-	-
Swanscombe North	327	49	145	26
Swanscombe South	208	26	63	11
Swanscombe West	219	36	75	19

Table 2 Species of Conservation Significance Recorded on Site

Key: N = Found in Swanscombe North
S = Found in Swanscombe South
W = Found in Swanscome West
Status = Current conservation status
LS = Local Significance
NS = National Significance

Species	N	S	W	Status	Comment	LS	NS
ARANEAE (Spiders)							
Araneidae							
Argiope bruennichi	1	0	0	Nationally Scarce a	Great increase in distribution and frequency. Temperature critical. Requires downgrading.	Low	Low
ORTHOPTERA (Crickets and Grasshoppers)							
Tettigoniidae (Bush Crickets)							
Conocephalus fuscus	0	0	1	Nationally Scarce a	Temperature critical. Needs revision downwards.	Low	Low
Metrioptera roeselii	0	1	0	Nationally Scarce b	Temperature critical. Needs revision downwards.	Low	Low
HEMIPTERA-HETEROPTERA (Bugs)							
Miridae (Capsid Bugs)							
Lygus pratensis	1	0	0	RDB 3	Recent increase in records suggests this species should be downgraded.	Medium	Medium
HEMIPTERA-HOMOPTERA (Bugs)							
Cicadellidae (Leafhoppers)							
Aphrodes aestuarinus	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Aphrodes aestuarius	0	0	1	Nationally Scarce	Justified, habitat restricted.	High	High
Cixiidae (Planthoppers)							

Species	N	S	W	Status	Comment	LS	NS
Oliarus panzeri	0	0	1	Nationally Scarce	Justified, habitat restricted.	High	High
LEPIDOPTERA (Butterflies and Moths)							
Arctiidae (Tiger Moths)							
Tyria jacobaeae	1	1	0	UK BAP	Modern assessment. Very widespread with a very common foodplant (Common Ragwort). A different categorisation from most the other species.	Medium	Medium
Geometridae (Looper Moths)							
Scotopteryx bipunctaria	1	0	1	Nationally Scarce b	Justified, habitat restricted. Possibly also a migrant, which would down-grade it.	High-Medium	High-Medium
Scotopteryx chenopodiata	1	0	1	UK BAP	Modern assessment, declines in a widespread and common moth, cf *Tyria jacobae*.	Medium	Medium
Lasiocampidae							
Malacosoma neustria	1	0	0	UK BAP	Modern assessment, declines in a widespread and common moth, cf *Tyria jacobae*.	Medium	Medium
Sesiidae (Clearwing Moths)							
Bembecia ichneumoniformis	1	1	1	Nationally Scarce b	Greatly overlooked by moth recorders. An active, day-flying moth which we have found fairly frequently in suitable habitats. Needs downgrading.	Medium	Medium

Species	N	S	W	Status	Comment	LS	NS
COLEOPTERA (Beetles)							
Apionidae (Weevils)							
Catapion curtisii	1	0	0	Nationally Scarce a	Justified.	High	High
Oxystoma cerdo	0	1	0	Nationally Scarce b	Increasing, possibly downgrade?	Medium	Medium
Protapion filirostre	0	0	1	Nationally Scarce b	Justified.	High	High
Carabidae (Ground Beetles)							
Brachinus crepitans	1	0	0	Nationally Scarce b	? Justified.	High	High
Ophonus ardosiacus	1	0	0	Nationally Scarce b	Justified.	High	High
Cerambycidae (Long-horn Beetles)							
Phytoecia cylindrica	0	1	0	Nationally Scarce b	? Justified. Evidence of expansion.	Medium	Medium
Coccinellidae (Ladybird Beetles)							
Hippodamia variegata	0	1	1	Nationally Scarce b	Very widespread along Thames Corridor.	Listed as High (Essex Red List as *Adonia variegata*), but we suggest this should be Low as it has increased markedly[1].	Medium
Cryptophagidae (Fungus beetles)							
Atomaria scutellaris	0	0	1	RDB K	Justified.	High	High

1. Confirmed by the entry in The Ladybirds of Britain and Ireland.

Species	N	S	W	Status	Comment	LS	NS
Curculionidae (Weevils)							
Mecinus collaris	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Mecinus janthinus	0	1	0	Nationally Scarce a	Justified.	High	High
Phyllobius vespertinus	1	0	0	Nationally Scarce b	Justified, habitat restricted.	High	High
Pselactus spadix	0	0	1	Nationally Scarce b	?Justified, habitat restricted, but often frequent.	Medium	Medium
Rhinusa linariae	1	0	0	Nationally Scarce a	Justified.	High	High
Sibinia arenariae	0	1	0	Nationally Scarce b	Justified, habitat restricted.	High	High
Sitona cinerascens	1	0	0	RDB K	Justified.	High	High
Sitona macularius	1	1	0	Nationally Scarce b	Justified.	High	High
Sitona waterhousei	0	0	1	Nationally Scarce b	Justified.	High	High
Tychius schneideri	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Tychius squamulatus	1	0	0	Nationally Scarce b	Justified.	High	High
Zacladus exiguus	0	1	0	Nationally Scarce b	Justified.	High	High
Drilidae							
Drilus flavescens	1	0	1	Nationally Scarce a	Justified.	High	High
Elateridae (Click Beetles)							
Athous campyloides	1	0	0	Nationally Scarce b	?Justified, apparently spreading.	Medium	Medium
Mordellidae (Tumbling Flower Beetles)							
Mordellistena acuticollis	1	0	1	RDB K	?Justified. Many new *Mordellistena* have been found recently in the UK.	Medium	Medium
Rhynchitidae (Weevils)							
Temnocerus tomentosus	1	0	0	Nationally Scarce b	Justified.	High	High

Species	N	S	W	Status	Comment	LS	NS
DIPTERA (Flies)							
Conopidae (Thick-headed Flies)							
Myopa strandi	0	0	1	RDB 3	Very ocasional, but this might be due in part at least to its very short adult life cycle.	High	High
Zodion cinereum	1	1	0	Nationally Scarce b	Very ocasional, but this might be due in part at least to its very short adult life cycle.	High	High
Stratiomyidae (Soldierflies)							
Stratiomys singularior	1	0	0	Nationally Scarce	Justified, habitat restricted.	High	High
Syrphidae (Hoverflies)							
Cheilosia cynocephala	1	0	0	Nationally Scarce	Justified, indeed may need uprating.	High	High
Pipizella maculipennis	0	0	1	RDB 3	Justified.	High	High
Pipizella virens	1	1	0	Nationally Scarce b	Justified.	High	High
Tachinidae (Parasite Flies)							
Cistogaster globosa	1	1	0	RDB 1	Probably needs downgrading, although much less frequent than in the 1990s	High	High
Gymnosoma nitens	0	1	0	RDB 1	Justified.	High	High
Tephritidae (Picture-wing Flies)							
Merzomyia westermanni	1	0	1	Nationally Scarce	? Perhaps needs downgrading.	Medium	Medium
Orellia falcata	0	1	0	Nationally Scarce	Justified.	High	High
Ulidiidae							

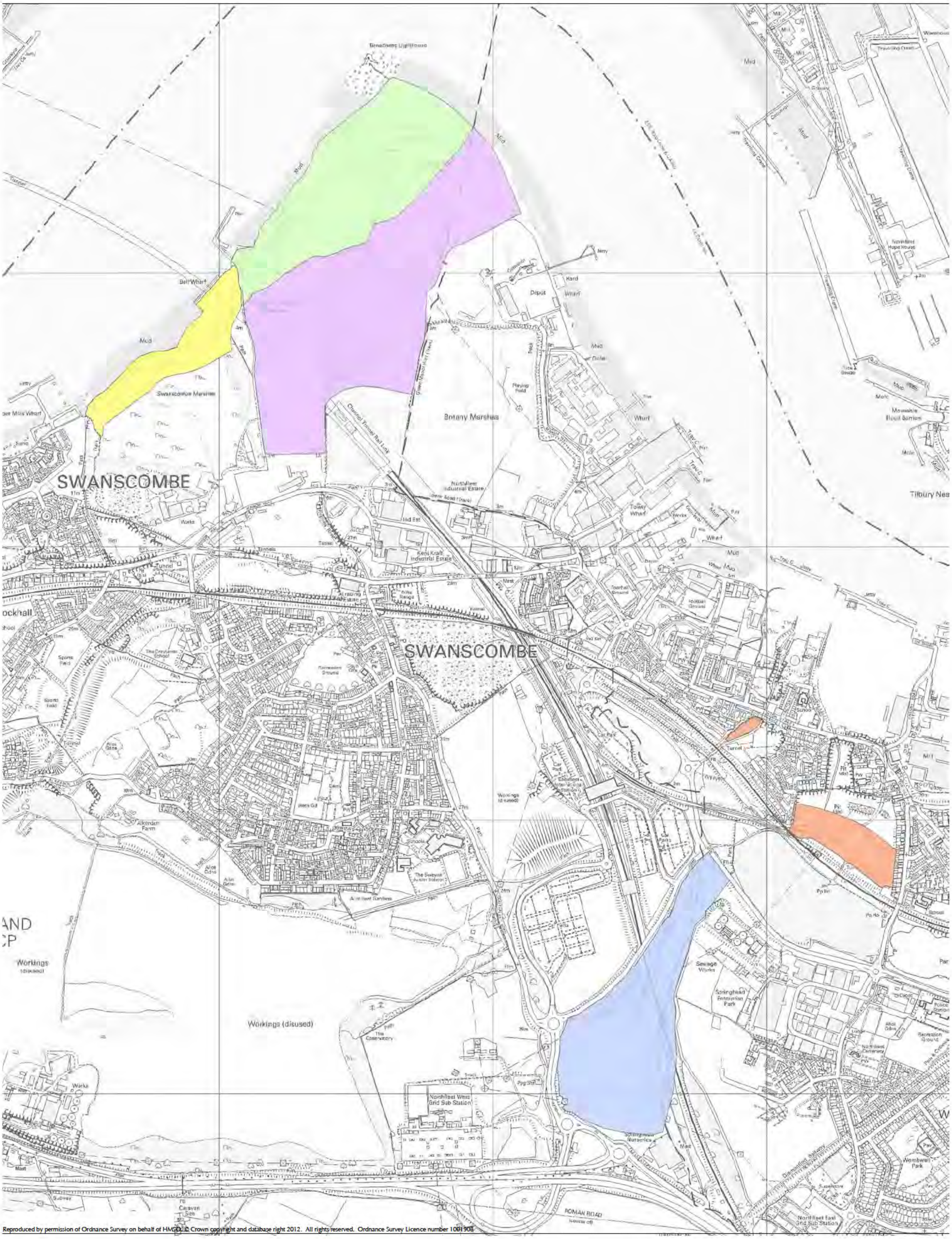
Species	N	S	W	Status	Comment	LS	NS
Dorycera graminum	1	0	0	RDB 3. UK BAP	Have found this species in most of the grassland sites we have surveyed along the Thames. Not found elsewhere.	Medium	High
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)							
Andrenidae (Mining Bees)							
Andrena alfkenella	1	0	0	RDB 3	Justified.	High	High
Andrena labiata	0	1	0	Nationally Scarce a	Become much more frequent over past ten years. Possibly requires downgrading.	High	Medium
Andrena minutuloides	1	1	1	Nationally Scarce a	Become much more frequent over past ten years. Possibly requires downgrading.	Medium	Medium
Andrena pilipes s.s	0	0	1	Nationally Scarce b	Justified.	High	High
Apidae (Bees)							
Bombus humilis	1	0	1	UK BAP	Modern assessment.	High. Part of largest area of potentially protected grassland habitat for this species in north of Thames corridor.	High. Restrict. range in UK. Major pop. in SE.
Ceratina cyanea	1	1	1	RDB 3	Increased distribution markedly in modern times.	Medium	Medium
Nomada flavopicta	0	0	1	Nationally Scarce b	Justified.	High	High

Species	N	S	W	Status	Comment	LS	NS
Nomada fucata	1	0	1	Nationally Scarce a	Needs revision downward. No threat.	Low	Low
Nomada fulvicornis	1	1	0	RDB 3	Justified.	High	High
Nomada hirtipes	1	0	0	RDB 3	Perhaps needs downgrading.	High	High
Colletidae (Bees)							
Colletes halophilus	1	1	1	Nationally Scarce a. UK BAP	Justified.	High	High
Colletes marginatus	0	0	1	Nationally Scarce a	Justified.	High	High
Hylaeus cornutus	1	0	0	Nationally Scarce a	Much more widespread now than previously. Needs downgrading.	Medium	Medium
Crabronidae (Solitary Wasps)							
Ectemnius dives	1	0	0	Nationally Scarce b	? Justified, perhaps needs downgrading.	Medium	Medium
Ectemnius sexcinctus	0	0	1	Nationally Scarce b	Justified.	High	High
Lestiphorus bicinctus	1	0	0	Nationally Scarce b	Justified.	High	High
Nysson trimaculatus	1	0	0	Nationally Scarce b	Perhaps needs downgrading.	Medium	Medium
Psenulus schencki	1	0	0	Nationally Scarce a	Justified.	High	High
Formicidae (Ants)							
Myrmica specioides	1	1	0	RDB 3	Inreceased distribution means this species needs downgrading.	Medium	Medium
Ponera coarctata	0	0	1	Nationally Scarce b	A cryptic species, but with few records - ? justified.	High	High
Halicitidae (Mining Bees)							
Lasioglossum malachurum	0	0	1	Nationally Scarce a	Needs revision downward. No threat.	Low	Low

Species	N	S	W	Status	Comment	LS	NS
Lasioglossum pauperatum	0	1	0	RDB 3	Justified.	Medium. Fairly frequent on unimprov. grassland sites in Thames Corridor.	High
Lasioglossum pauxillum	1	1	1	Nationally Scarce a	Needs revision downward. Currently spread northwards. Can be commonest species in wide variety of habitats in S. England. No threat.	Low	Low
Lasioglossum puncticolle	1	1	1	Nationally Scarce b	Justified.	Medium. Fairly frequent on unimprov. grassland sites in Thames Corridor.	High
Sphecodes crassus	0	1	0	Nationally Scarce b	Justified?	Medium	Medium but I.D. difficult
Sphecodes reticulatus	1	0	0	Nationally Scarce a	?Justified.	High	Medium
Sphecodes rubicundus	1	0	0	Nationally Scarce a	Justified.	High	High
Megachilidae (Leafcutter and Mason Bees)							
Megachile leachella	1	1	1	Nationally Scarce b	More widespread than orignally thought. Needs downgrading. Habitat restricted.	Medium	Medium
Melittidae (Bees)							
Melitta leporina	0	0	1	Nationally Scarce b	Justified.	High	High
Melitta tricincta	1	0	1	Nationally Scarce b	? Justified.	Medium	Medium

Species	N	S	W	Status	Comment	LS	NS
Pompilidae (Spider-hunting Wasps)							
Priocnemis cordivalvata	1	0	0	Nationally Scarce b	Justified, possibly needs revision upwards.	High	High
Vespidae (Social and Potter Wasps)							
Odynerus melanocephalus	1	0	1	Nationally Scarce a. UK BAP	Justified.	High	High

FIGURES



KEY

- Swanscombe West
- Swanscombe North
- Swansombe South
- Cement Works and Quarry
- Grassland East of Ebbsfleet Station

0 250 500 m

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Terrestrial Invertebrate Survey Report

N

FIGURE 1
Areas Referred to in the Report

KEY

Swanscombe North

Swansombe South

0 75 150 m

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FIGURE 2
Swanscombe North and South Sampling Areas

KEY

Indicated in the descriptions above are the main areas of habitat sampled.
No sampling took place south of the ditch running parallel to, and south of the road.

0 50 100 m

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Terrestrial Invertebrate Survey Report

N

FIGURE 3
Swanscombe West
Sampling Areas

APPENDIX A
Total List of Species Recorded

Table A1 Total List of Species Recorded on Site
Key: N = Found in Swanscombe North
S = Found in Swanscombe South
W = Found in Swanscome West
Status = Current conservation status

Species	N	S	W	Status	Distribution	Notes
ARANEAE (Spiders)						
Agelenidae						
Agelena labyrinthica	0	0	1		Southern Widespread	Commonly found. Amongst rough grassland and heathland. It spins its funnel web near ground level amongst tall vegetation, heather and occasionally in gorse preying on mainly grasshoppers.
Argiope bruennichi	1	0	0	Nationally Scarce a	Southern Restricted	Frequently found, but very southern, Expanding range recently. The species preys particularly on Grasshoppers.
ODONATA (Damsel and Dragonflies)						
Aeshnidae (Hawker Dragonflies)						
Aeshna cyanea	1	0	0		Universal	Commonly found in the south, but scarcer towards the north. Breeds in still waters of various sizes, including garden ponds. Possibly associated with open woodland conditions.
Coenagrionidae (Damselflies)						
Enallagma cyathigerum	1	0	0		Universal	Common Blue Damselfly. Commonly found. Breeds in a variety of open waters.
Ischnura elegans	1	0	0		Universal	Blue-tailed Damselfly. Commonly found. A very adaptable species as a larva.
Libellulidae (Darter Dragonflies)						
Sympetrum striolatum	1	0	1		Universal	Common Darter Dragonfly. Abundantly found. Associated with a range of still and slowly-flowing water bodies.

Species	N	S	W	Status	Distribution	Notes
ORTHOPTERA (Crickets and Grasshoppers)						
Acrididae (Grasshoppers)						
Chorthippus albomarginatus	1	0	1		Southern Restricted	Lesser Marsh Grasshopper. Locally common in wet grasslands in southen and midland England. Tends to be coastal.
Chorthippus brunneus	1	1	1		Universal	Field Grasshopper. Commonly found. A ready coloniser of disturbed areas with a sparse vegetation.
Chorthippus parallelus	0	0	1		Universal	Meadow Grasshopper. Commonly found in a variety of grassy habitats.
Omocestus viridulus	1	0	0		Universal	Common Green Grasshopper. Commonly found. Long grass in moister situations.
Tetrigidae (Groundhoppers)						
Tetrix subulata	0	1	0		Southern Widespread	Slender Ground-hopper. Frequently found in wet places.
Tetrix undulata	0	0	1		Universal	Common Ground-hopper. Commonly found in damp places with areas of bare mud.
Tettigoniidae (Bush Crickets)						
Conocephalus fuscus	0	0	1	Nationally Scarce a	Southern Widespread	Long-winged Cone-head. Commonly found. Increasingly widespread throughout southern England.
Leptophyes punctatissima	1	0	0		Southern Widespread	Speckled Bush-cricket. Commonly found. Strongly biased towards southern England and Wales. Scrub.
Meconema thalassinum	0	0	1		Southern Widespread	Oak Bush-cricket. Commonly found. Wooded localities in the southern British Isles.
Metrioptera roeselii	0	1	0	Nationally Scarce b	Southern Restricted	Roesel's Bush-cricket. Commonly found in long grasslands and spreading rapidly in southern Britain.

Species	N	S	W	Status	Distribution	Notes
Tettigonia viridissima	0	0	1		Southern Restricted	Great Green Bush Cricket. Locally frequently found. Associated with scrubby grassland, but needs thin turf for oviposition.
DERMAPTERA (Earwigs)						
Forficulidae (Earwigs)						
Forficula auricularia	1	1	0		Universal	Common Earwig. Very commonly found.
MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)						
Hemerobiidae (Brown Lacewings)						
Micromus angulatus	0	0	1		Southern Widespread	Local and infrequently found. In a variety of habitats.
HEMIPTERA-HETEROPTERA (Bugs)						
Berytinidae (Stiltbugs)						
Cymus melanocephalus	0	0	1		Southern Widespread	Commonly found on rushes, *Juncus*.
Coreidae (Squashbugs)						
Coreus marginatus	1	1	1		Southern Widespread	Commonly found. On *Rumex* and *Polygonum*.
Coriomeris denticulatus	1	1	0		Southern widespread	Frequently found. Feeds on legumes.
Lygaeidae (Groundbugs)						
Ischnodemus sabuleti	1	1	1		Southern Restricted	Commonly found. Usually in wetland habitats. Reedbeds.
Nysius senecionis	0	0	1		Southern Widespread	Locally frequently found, on ragwort and Common Fleabane. Recent colonist.
Peritrechus geniculatus	0	1	0		Southern Widespread	Commonly found, in dry grassland habitats.

Species	N	S	W	Status	Distribution	Notes
Taphropeltus contractus	1	0	0		Universal	Commonly found. sparsely-vegetated, dry soils amongst leaf litter.
Miridae (Capsid Bugs)						
Adelphocoris lineolatus	1	1	1		Universal	Commonly found. The larval food plants are all Fabaceae, although the adults may be on Asteraceae.
Closterotomus norwegicus	1	1	1		Universal	Commonly found on a variety of plants.
Deraeocoris lutescens	1	0	1		Southern Widespread	Commonly found. On a variety of tree foliage.
Europiella artemisiae	1	0	0		Southern Widespread	Commonly found. Associated with *Artemesia*.
Europiella artemisiae	1	0	0		Southern Widespread	Commonly found. Associated with *Artemesia*.
Heterotoma planicornis	1	0	0		Universal	Commonly found on a variety of plant species.
Leptopterna dolabrata	0	1	0		Universal	Commonly found. Associated with grasses.
Leptopterna ferrugata	0	0	1		Universal	Commonly found. Associated with grasses.
Liocoris tripustulatus	1	0	0		Universal	Commonly found, on Stinging Nettle *Urtica dioica*.
Lygus maritimus	1	0	0		Southern widespread	Frequently found. It occurs in a range of open habitats on a variety of host-plants including mayweed, fat hen and sorrel.
Lygus pratensis	1	0	0	RDB 3	Southern Restricted	Infrequently found, There has been much taxonomic confusion in the past and many old records are unreliable. Found in a variety of habitats including woodland rides and grassland. Biology and ecology are uncertain. Increasing recently.
Macrotylus horvathi	1	0	0		Southern Restricted	Infrequently found. Associated with *Ballota nigra*. Recently found in Britain, currently known from Kent only.
Macrotylus paykulli	0	1	0		Southern widespread	Commonly found, Rest Harrow.

Species	N	S	W	Status	Distribution	Notes
Notostira elongata	1	1	1		Southern Widespread	Commonly found, associated with grasses.
Orthocephalus saltator	0	0	1		Universal	Commonly found on a variety of herbaceous plants.
Orthops campestris	1	0	0		Universal	Commonly found, on several species of Apiaceae.
Orthops kalmii	1	0	0		Universal	Commonly found. On several species of Apiaceae, the eggs are laid in the flower-head.
Orthotylus flavosparsus	0	0	1		Universal	Frequently found. On Chenopodaceae, especially Fat Hen, goosefoots and oraches. Most frequent in coastal habitats.
Orthotylus moncreaffi	0	0	1		Southern Widespread	Coastal habitats, on Chenopodaceae, especially Sea Purslane.
Phytocoris varipes	1	0	1		Southern Widespread	Commonly found associated with grasses.
Plagiognathus chrysanthemi	1	0	1		Universal	Commonly found. On a variety of herbaceous plants.
Stenodema calcarata	0	0	1		Universal	Commonly found. Associated with grasses.
Trigonotylus ruficornis	0	0	1		Universal	Commonly found associated with grasses.
Nabidae (Damselbugs)						
Himacerus mirmicoides	0	1	0		Southern Widespread	Commonly found. In grassland habitats.
Nabis flavomarginatus	1	0	0		Universal	Commonly found. It lives amongst grasses, especially where they grow in damp areas or become tussocky. Widely distributed throughout the British Isles.
Pentatomidae (Sheildbugs)						
Aelia acuminata	1	1	1		Southern Restricted	Commonly found, associated with grasses.
Dolycoris baccarum	1	0	1		Universal	Commonly found. On a variety of herbaceous plants.

Species	N	S	W	Status	Distribution	Notes
Eurydema oleracea	1	0	0		Southern Restricted	Infrequently found. It feeds on the leaves of various crucifers, especially horse-radish and garlic mustard. Perhaps increased in recent years.
Eurydema oleracea	1	0	0		Southern Restricted	Infrequently found. It feeds on the leaves of various crucifers, especially horse-radish and garlic mustard. Perhaps increased in recent years.
Palomena prasina	1	0	0		Universal	Commonly found on a variety of herbaceous plants.
Picromerus bidens	1	0	0		Universal	Commonly found, on a variety of plants, often on heather.
Podops inuncta	0	1	0		Southern Widespread	Frequently found. in dry grassland habitats.
Sciocoris cursitans	1	0	0		Southern Restricted	Frequently found, but local. On dry sandy or chalky soils. Associated with low-growing plants such as Potentilla and Pilosella.
Scutelleridae (Shieldbugs)						
Eurygaster testudinaria	1	0	0		Southern Restricted	Frequently found. Local, associated with grasses.
Tingidae (Lacebugs)						
Acalypta parvula	0	1	0		Universal	Frequently found.
HEMIPTERA-HOMOPTERA (Bugs)						
Cercopidae (Froghoppers)						
Aphrophora alni	1	1	1		Universal	Commonly found, on a variety of trees and shrubs.
Neophilaenus campestris	1	1	1		Southern Widespread	Locally frequently found. Associated with calcareous grassland.
Philaenus spumarius	1	1	1		Universal	Commonly found. On a variety of trees and herbaceous plants.
Cicadellidae (Leafhoppers)						

Species	N	S	W	Status	Distribution	Notes
Aphrodes aestuarinus	0	0	1	Nationally Scarce b	Southern Restricted	Infrequently found. Saltmarshes between Dorset and Norfolk. Possibly associated with Shrubby Seablite *Suaeda maritima*.
Aphrodes aestuarius	0	0	1	Nationally Scarce	Southern Widespread	Infrequently found. A coastal species (Lancashire to Lincolnshire) with an association with Shrubby Seablite *Suaeda vera* and possibly Annual Seablite *Suaeda maritima*. Associations with Saltmarsh Grass *Pucinella maritima* and Sea Purslane *Atriplex portulacoides*.
Paramesus obtusifrons	1	0	0		Southern Widespread	Locally frequently found. Associated with coastal marshes. On *Bolboschoenus maritimus* and, possibly, *Phragmites communis*.
Cixiidae (Planthoppers)						
Cixius pilosus	1	0	0		Universal	Commonly found. Dry grassland.
Oliarus panzeri	0	0	1	Nationally Scarce	Southern Restricted	Locally Infrequently found. The ecology is poorly understood but it may prefer areas that are periodically waterlogged but which dry out and crack in summer. The foodplants are unknown but the nymphs are thought to be root feeders.
Delphacidae (Planthoppers)						
Asiraca clavicornis	1	0	1		Southern Restricted	Locally Frequently found. On grasses. Apparently much declined but still frequent in the London district.
Issidae (Planthoppers)						
Issus coleoptratus	1	0	1		Southern Widespread	Frequently Found. Associated with ivy *Hedera helix*.
Membracidae (Planthoppers)						
Centrotus cornutus	0	1	0		Universal	Frequently found, but local, feed on sap of oak.
LEPIDOPTERA (Butterflies and Moths)						

Species	N	S	W	Status	Distribution	Notes
Arctiidae (Tiger Moths)						
Phragmatobia fuliginosa	1	0	0		Universal	Ruby Tiger Moth. Commonly found. The hairy larvae feed on a variety of low plants.
Tyria jacobaeae	1	1	0	UK BAP	Universal	The Cinnabar moth. Commonly found. Larvae feed on Ragwort.
Geometridae (Looper Moths)						
Scotopteryx bipunctaria	1	0	1	Nationally Scarce b	Southern Restricted	The Chalk Carpet moth. Frequently found. The larva feeds on common bird's-foot trefoil, other trefolis, vetches and clovers. A species of calcareous sites, preferring those with rocks or bare ground.
Scotopteryx chenopodiata	1	0	1	UK BAP	Universal	Shaded Broad-bar moth. Frequently found. The larva feeds on species of vetch and clover.
Hesperiidae (Skipper Butterflies)						
Thymelicus lineola	0	0	1		Southern Restricted	Essex Skipper butterfly. Commonly found. The larva feeds on various grasses, particularly cock's-foot and creeping soft-grass. More or less restricted to southern and eastern England, but apparently spreading.
Thymelicus sylvestris	1	1	1		Southern Widespread	Small Skipper butterfly. Commonly found. The larva feeds on grasses, especially Holcus spp.
Lasiocampidae						
Malacosoma neustria	1	0	0	UK BAP	Universal	The Lackey Moth. Frequently found. The hairy larvae are initially gregarious and feed on many deciduous trees and shrubs.
Lycaenidae (Blue Butterflies)						
Celastrina argiolus	1	1	0		Southern Widespread	Holly Blue butterfly. Commonly found. There are two generations a year, larvae of the first feeding principally on the flowers of holly and of the second on buds of ivy.

Species	N	S	W	Status	Distribution	Notes
Polyommatus icarus	1	1	1		Universal	Common Blue butterfly. Commonly found. The larva feeds on various legumes, especially bird's-foot trefoil.
Noctuidae (Cut-worm Moths)						
Autographa gamma	1	0	0		Migrant	Silver Y moth. Migrant. Very commonly found. It flies readily by day and can be seen at dusk hovering over nectar sources.
Euclidia glyphica	0	0	1		Universal	Burnet Companion moth. Commonly found. The larvae feeds on trefoils and clovers.
Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)						
Maniola jurtina	0	0	1		Universal	Meadow Brown butterfly. Commonly found. The larva feeds on many species of grass, preferring the finer varieties. It occurs in open grassy situations.
Pararge aegeria	1	0	0		Universal	Speckled Wood butterfly. Commonly found. Associated with shady woodlands, although it still requires patches of sunlight. The larva feeds on grasses, usually in sheltered situations such as woodland and scrub.
Polygonia c-album	0	1	0		Southern Widespread	Comma butterfly. Commonly found. The larva feeds on the leaves of nettle, elm and hop.
Pyronia tithonus	1	0	1		Southern Widespread	Gatekeeper butterfly. Commonly found. The larva feeds on various grasses, narrow-bladed species being preferred.
Pieridae (White Butterflies)						
Gonepteryx rhamni	0	1	0		Southern Widespread	Brimstone butterfly. Commonly found. The larva feeds on buckthorns.
Pieris brassicae	1	0	0		Universal	Large White butterfly. Commonly found. The larva feeds on various wild crucifers and legumes as well as cultivated cabbage.

Species	N	S	W	Status	Distribution	Notes
Pieris napi	0	1	0		Universal	Green-veined White. Commonly found. The larva feeds on wild crucifers, preferring those growing in damp and sheltered areas.
Pieris rapae	1	0	0		Universal	Small White butterfly. Commonly found. The larva feeds on a range of wild crucifers as well as cultivated ones.
Pyralidae						
Sitochroa palealis	1	1	0		Southern Restricted	Very locally frequently found. Larvae in a web in the seed heads of Daucus carota.
Sesiidae						
Bembecia ichneu-moniformis	1	1	1	Nationally Scarce b	Southern Widespread	6-Belted Clearwing. Locally frequently found, but easily missed. Flies fast in sunshine. Wasp mimic. Larva feeds at roots of *Lotus corniculatus* and *Anthyllis vulneraria*.
Zygaenidae (Burnett Moths)						
Zygaena filipendulae	0	0	1		Universal	6-spot Burnet moth. Commonly found. The larva feeds on bird's-foot trefoil but also needs long grass on which to make its cocoon.
COLEOPTERA (Beetles)						
Apionidae (Weevils)						
Aspidapion aeneum	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Aspidapion radiolus	1	1	0		Universal	Frequently found. On mallow *Malva* species.
Catapion curtisii	1	0	0	Nationally Scarce a	Southern Restricted	Very local, rarely found. There are recent (post-1970) records from only a few coastal sites in the Isle of Wight, South Hampshire, Phytophagous. The larvae develop in galls in the rootstocks of white clover *Trifolium repens* and strawberry clover *Trifolium fragiferum*. Adults have also been recorded from subterranean clover *Trifolium subterraneum* in the Isle of Wight.

Species	N	S	W	Status	Distribution	Notes
Eutrichapion ervi	1	0	1		Universal	Commonly found. On vetches, especially *Lathyrus pratensis*.
Eutrichapion viciae	1	0	0		Universal	Frequently found, on Yellow Vetchling *Lathyrus pratensis*.
Holotrichapion pisi	1	1	1		Universal	Commonly found. Associated with *Medicago* species, larvae develop in vegetative buds.
Ischnopterapion loti	1	1	1		Universal	Commonly found, on Bird's-foot Trefoil *Lotus corniculatus*.
Malvapion malvae	1	1	0		Southern Restricted	Frequently found. On mallow *Malva* species.
Oxystoma cerdo	0	1	0	Nationally Scarce b	Southern Widespread	Widespread but local, formerly confined to the midlands and northern Britain. Now recorded widely in south-east England, where it is possibly a recent colonist. Phytophagous. Associated with vetches, especially tufted vetch *Vicia cracca*. The larvae develop in the pods feeding on the seeds.
Oxystoma pomonae	1	0	1		Southern Restricted	Frequently found. On Yellow Vetchling *Lathyrus pratensis*.
Perapion violaceum	0	0	1		Universal	Commonly found, on dock *Rumex* species.
Protapion apricans	1	1	1		Universal	Commonly found, on Red Clover *Trifolium pratense*.
Protapion assimile	1	0	0		Universal	Commonly found. On *Trifolium* species.
Protapion filirostre	0	0	1	Nationally Scarce b	Southern Widespread	Locally frequently found. On *Trifolium campestre, T. dubium* & *T. aureum*. Larvae in flower heads.
Protapion trifolii	0	1	1		Southern Widespread	Commonly found. On clover *Trifolium pratense* & *T. medium*.
Pseudapion rufirostre	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Pseudapion rufirostre	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Stenopterapion meliloti	1	1	1		Southern Restricted	Locally frequently found. Associated with *Melilotus*, larvae develop in the stems.
Stenopterapion tenue	1	0	1		Southern Widespread	Commonly found. On *Medicago* and probably *Melilotus* species.

Species	N	S	W	Status	Distribution	Notes
Bruchididae (Seed Weevils)						
Bruchidius imbricornis	1	0	0		Southern Restricted	Locally frequently found. A very recent discovery. Associated with Goat's Rue *Calega officinalis*. Larvae develop and pupate in the seeds.
Bruchidius varius	1	1	1		Southern Restricted	Commonly found, on clover *Trifolium pratense & T. medium*.
Bruchus brachialis	1	1	1		Southern Restricted	Locally commonly found, on Fodder Vetch *Vicia villosus*. Larvae develop in the seed pods.
Bruchus loti	1	1	1		Southern Restricted	Commonly found, on Bird's-foot Trefoil *Lotus corniculatus*.
Bruchus rufimanus	1	0	1		Southern Widespread	Commonly found. On Yellow Vetchling *Lathyrus pratensis*. also on stored legume crops.
Bruchus rufipes	1	1	1		Southern Restricted	Commonly found. On Fabaceae.
Byrrhidae						
Curimopsis maritima	1	0	0		Southern Widespread	Commonly found. Associated with sparsely-vegetated, dry soils, mostly coastal.
Cantharidae (Soldier Beetles)						
Cantharis cryptica	0	1	1		Universal	Commonly found. Associated with areas of lush vegetation.
Cantharis lateralis	1	0	1		Southern Widespread	Commonly found, associated with grassland habitats.
Cantharis nigra	1	0	0		Universal	Commonly found. In lowland marshes and meadows.
Cantharis rustica	1	0	0		Southern Widespread	Commonly found, in a variety of grassland habitats.
Malthinus flaveolus	0	0	1		Universal	Commonly found, on the foliage of trees and shrubs.
Malthinus seriepunctatus	0	0	1		Southern Widespread	Commonly found, in broadleaf woodland habitats.
Rhagonycha fulva	1	1	1		Universal	Commonly found. In a wide variety of habitats.
Carabidae (Ground Beetles)						

Species	N	S	W	Status	Distribution	Notes
Amara tibialis	1	0	0		Universal	Commonly found. Sandy soils.
Badister bullatus	0	1	0		Universal	Commonly found.
Bembidion lunulatum	1	0	0		Southern Widespread	Commonly found.
Bembidion minimum	0	0	1		Universal	Commonly found. On mud and in tidal debris in estuaries and saltmarshes.
Bembidion properans	1	1	1		Southern Widespread	Commonly found. Associated with open sunny places.
Brachinus crepitans	1	0	0	Nationally Scarce b	Southern Restricted	Frequently found but local. Associated with open stoney places, particularly on calcareous soils. It has been found in chalk and limestone quarries, the margins of arable fields, clay-pits, and in various coastal habitats including stabilised shingle beaches. Adults are gregarious and are found under stones or at plant roots. Adults are predatory and the larvae are probably parasitic on pupae of other beetles.
Brachinus crepitans	1	0	0	Nationally Scarce b	Southern Restricted	Frequently found but local. Associated with open stony places, particularly on calcareous soils. It has been found in chalk and limestone quarries, the margins of arable fields, clay-pits, and in various coastal habitats including stabilised shingle beaches. Adults are gregarious and are found under stones or at plant roots. Adults are predatory and the larvae are probably parasitic on pupae of other beetles.
Calathus fuscipes	1	0	0		Universal	Commonly found. Associated with open habitats.
Cicindela campestris	0	1	0		Universal	Green Tiger Beetle. Locally frequently found. Strongly associated with open habitats with sunny bare ground, including heaths or moors.
Curtonotus aulicus	1	0	0		Universal	Commonly found, adults feed on seeds of Asteraceae.

Species	N	S	W	Status	Distribution	Notes
Curtonotus aulicus	1	0	0		Universal	Commonly found, adults feed on seeds of Asteraceae.
Curtonotus convexiusculus	0	0	1		Universal	Frequently found, coastal, but also found in dry open situations well inland.
Dicheirotrichus gustavi	0	0	1		Universal	Commonly found. A saltmarsh species living around the high tide mark.
Harpalus affinis	1	0	0		Universal	Commonly found.
Microlestes maurus	1	0	0		Southern Restricted	Commonly found. Associated with leaf litter on dry soils.
Notiophilus biguttatus	1	0	0		Universal	Very commonly found. In many different habitats, including gardens.
Ophonus ardosiacus	1	0	0	Nationally Scarce b	Southern Restricted	Found mainly on chalk but occasionally on clay soils, in cultivated land, undercliffs, cliff-tops, sea walls and upper levels of beaches. Phytophagous, feeding mainly on seeds.
Paradromius linearis	1	1	1		Universal	Commonly found, in grassland habitats.
Pterostichus madidus	1	0	0		Universal	Commonly found, in a wide variety of habitats.
Syntomus foveatus	1	1	1		Universal	Commonly found, on open dry soils, including arable land.
Cerambycidae (Long-horn Beetles)						
Grammoptera ruficornis	0	0	1		Southern Widespread	Commonly found in woodland habitats. Larvae develop in small twigs.
Phytoecia cylindrica	0	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. The larvae live in umbelifer stems in open grasslands.
Pseudovadonia livida	0	1	0		Southern Restricted	Commonly found. In dry grassland.
Stenurella melanura	0	1	1		Southern Widespread	Locally commonly found, adults visit flowers, breeds in dead wood.
Chrysomelidae (Leaf Beetles)						
Aphthona euphorbiae	0	0	1		Southern Widespread	Commonly found, often on ivy, a pest of flax *Linum* species.

Species	N	S	W	Status	Distribution	Notes
Cassida rubiginosa	0	0	1		Universal	Commonly found, on thistles.
Chrysolina americana	1	0	0		Southern Restricted	A recent arrival from the Mediterranean region with a distribution centred around London although there are several records from elsewhere. Associated with Lavender and Rosemary.
Chrysolina hyperici	1	0	0		Southern Widespread	Commonly found,on St John's-wort *Hypericum* species.
Crepidodera aurata	1	0	0		Universal	Commonly found, on willows *Salix* species.
Cryptocephalus aureolus	1	0	1		Universal	Frequently found. Adults are usually seen in the flowers of yellow Asteraceae growing in short turf. It is not known what the larvae do.
Cryptocephalus fulvus	1	1	1		Southern Widespread	Locally commonly found, in dry grassland.
Cryptocephalus hypochaeridis	1	1	1		Southern Widespread	Frequently found on calcareous grasslands. Adults usually seen in flowers, especially those of Asteracea. Details of life-history not known.
Cryptocephalus labiatus	1	0	0		Universal	Commonly found, on foliage of broadleaf trees.
Cryptocephalus moraei	1	0	0		Southern Widespread	Frequently found. The adults and larvae feed on St. John's-wort growing in short vegetation.
Longitarsus melanocephalus	0	0	1		Universal	Common, on Ribwort Plantain *Plantago lanceolata*.
Longitarsus pratensis	1	1	0		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Longitarsus succineus	1	0	0		Universal	Commonly found. Both adults and larvae feed on the foliage of various Asteraceae.
Neocrepidodera transversa	0	1	0		Universal	Commonly found. On thistles.
Phyllotreta nigripes	1	0	1		Universal	Commonly found, on Brassicaceae.
Coccinellidae (Ladybird Beetles)						

Species	N	S	W	Status	Distribution	Notes
Adalia decempunctata	1	0	1		Universal	Commonly found, on foliage of broadleaf trees.
Halyzia sedecimguttata	0	0	1		Southern Widespread	Commonly found, on tree foliage, often on Sycamore.
Harmonia axyridis	1	1	1		Southern Widespread	Harlequin Ladybird. Commonly found. A fairly large ladybird occurring in a wide range of colour patterns. It occurs on various herbaceous plants and trees, the larvae being predatory on aphids and other insects. A recent addition to the British fauna, spreading rapidly.
Hippodamia variegata	0	1	1	Nationally Scarce b	Southern Widespread	Frequently found but local in southern England and Wales. Associated with a variety of habitats especially dry grassland on sandy soils. The larvae and adults are predatory upon aphids.
Nephus redtenbacheri	0	0	1		Universal	Frequently found, but local, in sparsely vegetated grassland. Feeds on scale insects.
Propylea quattuordecim-punctata	1	1	1		Universal	Commonly found. In a wide variety of habitats.
Psyllobora vigintiduo-punctata	1	1	1		Southern Widespread	Commonly found. In grassland habitats.
Rhyzobius litura	1	1	1		Universal	Commonly found, in grassland habitats. Feeds on scale insects.
Subcoccinella vigintiquattuor-punctata	1	1	0		Universal	Commonly found, in dry grassland.
Tytthaspis sedecimpunctata	0	1	1		Universal	16-spot ladybird. Commonly found, in wet grassland.
Cryptophagidae (Fungus beetles)						
Antherophagus pallens	1	0	0		Universal	Commonly found. In the nests of Bumblebees.

Species	N	S	W	Status	Distribution	Notes
Atomaria scutellaris	0	0	1	RDB K	Southern Restricted	Infrequently found. For many years this tiny beetle was known in Britain only from the Isles of Scilly. However, it has recently become established in south-east England. It has been found in a variety of habitats but is perhaps most frequent near the coast.
Ephistemus globulus	0	1	0		Universal	Commonly found. In decaying vegetation.
Curculionidae (Weevils)						
Anthonomus pedicularius	0	1	0		Universal	Commonly found. On hawthorn *Crataegus* species.
Barypeithes pellucidus	1	0	0		Southern Restricted	Commonly found on low growing plants.
Ceutorhynchus contractus	1	0	0		Universal	Commonly found. In a variety of grassland and ruderal habitats. Polyphagous on a wide variety of Brassicaceae.
Ceutorhynchus obstrictus	1	1	1		Universal	Commonly found. Feeds on Brassicaceae.
Ceutorhynchus pallidactylus	1	0	0		Universal	Commonly found, on Brassicaceae.
Ceutorhynchus turbatus	1	1	1		Southern Widespread	Frequently found. Mainly southern England and East Anglia, recently in North Wales, probably spreading, as is the host plant. On open, often disturbed ground, associated with Hoary Cress *Lepidium draba*, larvae develop in the fruits, pupates in the soil. First found in Britain in 1951.
Ceutorhynchus typhae	1	0	0		Universal	Commonly found, on Brassicaceae.
Curculio glandium	0	0	1		Southern Restricted	Commonly found, on oak.
Dorytomus taeniatus	1	0	0		Universal	Commonly found, on willows *Salix* species.
Euophryum confine	0	1	0		Southern Widespread	Commonly found. Breeds in dead wood, a native of New Zealand.
Hypera nigrirostris	1	0	0		Universal	Commonly found, on clover, especially *Trifolium pratense*.

Species	N	S	W	Status	Distribution	Notes
Hypera plantaginis	1	0	0		Universal	Commonly found. On various species of Fabaceae.
Hypera postica	1	1	1		Southern Widespread	Commonly found. Feeds on Fabaceae.
Lixus scabricollis	1	0	0		Southern Restricted	Commonly found. Coastal, recent colonist. Sea Beet.
Mecinus collaris	0	0	1	Nationally Scarce b	Universal	Locally frequently found. In saltmarshes. Phytophagous. Associated with Sea Plantain *Plantago maritima*. The larvae develop in galls in the flowering stem, just below the inflorescence. Populations are frequently affected by parasitism.
Mecinus janthinus	0	1	0	Nationally Scarce a	Southern Restricted	First discovered in Britain in 1948, this small bluish weevil has been recorded since 1970 from East Kent, West Kent and South Essex, with older records for Surrey and Middlesex. Found on disturbed ground, grassland and road verges, often on chalky soils. Phytophagous. Associated with Common Toadflax *Linaria vulgaris*.
Mecinus labilis	0	1	0		Southern Widespread	Locally frequently found. On Plantains.
Mecinus pascuorum	1	1	1		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Mecinus pyraster	1	1	0		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Otiorhynchus ovatus	1	1	0		Universal	Frequently found. On sandy soils
Otiorhynchus rugosostriatus	1	0	0		Universal	Frequently found. Local in England and Wales, uncommon in Scotland. Parthenogenetic and polyphagous, a minor pest of soft fruit.
Phyllobius pyri	0	0	1		Universal	Commonly found, on a variety of tree species.
Phyllobius roboretanus	1	0	1		Southern Widespread	Commonly found, in grassland habitats.

Species	N	S	W	Status	Distribution	Notes
Phyllobius vespertinus	1	0	0	Nationally Scarce b	Southern Widespread	Locally frequently found. Coastal. Found amongst herbaceous vegetation in saltmarshes and other coastal habitats. Phytophagous and probably polyphagous, but an association with *Artemisia maritima* has been suggested.
Phyllobius virideaeris	1	1	1		Universal	Commonly found. In Grassland habitats.
Polydrusus pulchellus	1	0	0		Universal	Frequently found. Confined to saltmarsh habitats where it has been associated with *Artemisia maritime* and Chenopodaceae but it is thought to be polyphagous.
Pselactus spadix	0	0	1	Nationally Scarce b	Southern Widespread	Commonly found. Coastal. Phytophagous. A wood-boring species which forms colonies in driftwood and old wooden sea defences.
Rhinusa antirrhini	1	1	1		Southern Widespread	Commonly found. Usually found inside the flowers of *Linaria vulgaris*, it is possible that the larvae develop in the flowers.
Rhinusa linariae	1	0	0	Nationally Scarce a	Southern Restricted	Infrequently found and localised. Phytophagous, the larvae develop in root galls on Common Toadflax *Linaria vulgaris*.
Sibinia arenariae	0	1	0	Nationally scarce b	Southern widespread	Locally frequently found along the coasts of southern England and parts of Wales. Phytophagous. It is associated with rock spurry *Spergularia rupestris*, sea spurry *Spergularia marina* and sand spurry *Spergularia rubra*.

Species	N	S	W	Status	Distribution	Notes
Sitona cinerascens	1	0	0	RDB K	Southern Restricted	Infrequently found and very local. According to Hyman & Parsons (1992) this weevil is known as British from a single specimen without data in the Stephens collection in the Natural History Museum (London), however, a population was recently discovered on Canvey Island, South Essex and a single example was swept at Cuckmere Haven in 2005. Phytophagous. The host plant is apparently Slender Bird's-foot Trefoil *Lotus tenuis* and possibly other *Lotus* species but the life history remains unknown. Not listed in the Insect Red Data Book (Shirt, 1987).
Sitona cylindricollis	1	1	0		Southern Widespread	Locally frequently found. Associated with *Melilotus*.
Sitona hispidulus	1	0	1		Universal	Commonly found, on *Trifolium* species.
Sitona humeralis	1	1	1		Universal	Frequently found. *Medicago*.
Sitona lepidus	0	1	1		Universal	Commonly found, on various species of Fabaceae.
Sitona lineatus	1	1	1		Universal	Commonly found. On various species of Fabaceae.
Sitona macularius	1	1	0	Nationally Scarce b	Universal	Infrequently found and very local. Occurs in grassland habitats, particularly on chalky soils. Phytophagous, associated with a variety of leguminous plants including Sainfoin *Onobrychis viciifolia*, Wild Liquorice *Astragalus glycyphyllos*, Bird's-foot Trefoil *Lotus corniculatus*, tare, *Vicia* and medick *Medicago*. The larvae feed on the roots and root nodules.
Sitona puncticollis	0	0	1		Universal	Locally frequently found. Associated with Clovers.
Sitona regensteinensis	0	1	0		Universal	Commonly found, on *Cytisus scoparius, Ulex* and *Genista*.
Sitona sulcifrons	1	1	1		Universal	Locally comonly found. Feeds on Trifolium species.
Sitona waterhousei	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found, Local, *Lotus* Coastal landslips, sandy grassland.

Species	N	S	W	Status	Distribution	Notes
Trachyphloeus angustisetulus	1	0	1		Universal	Locally infrequently found. Associated with bare and re-vegetating ground.
Trichosirocalus troglodytes	1	1	1		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Tychius breviusculus	1	0	1		Southern Restricted	Infrequently found and very local. A recent discovery in Britain, currently known from ruderal sites close to the River Thames between London and Canvey Island where it is well established in several places. Also recorded from one site on the Dorset coast. Associated with *Melilotus* species, possibly preferring White Melilot *M. alba*.
Tychius junceus	1	1	0		Universal	Infrequently found and local In open grassland habitats on light soils. Associated with medicks, e.g., Black Medick *Medicago lupulina*.
Tychius meliloti	0	1	0		Southern Widespread	Infrequently found and localised. On melilot *Melilotus* species.
Tychius picirostris	0	0	1		Universal	Commonly found, on *Trifolium* species.
Tychius schneideri	0	0	1	Nationally Scarce b	Southern Restricted	Frequently found, but local. Phytophagous. It is found on calcareous grassland, cliff-tops and shingle beach habitats where its foodplant Kidney Vetch *Anthyllis vulneraria* grows.
Tychius squamulatus	1	0	0	Nationally Scarce b	Southern Restricted	Infrequently found. In grassland habitats on sandy soils, possibly preferring calcareous conditions. Phytophagous, associated with Bird's-foot Trefoil *Lotus corniculatus*. The larvae develop in the seed pods.
Tychius stephensi	1	1	0		Southern Restricted	Locally frequently found. In dry grasslands, associated with *Trifolium* species.
Zacladus exiguus	0	1	0	Nationally Scarce b	Southern Widespread	Locally infrequently found. Associated with the smaller-flowered Cranesbills, especially Cut Leaved and Hedgerow Cranesbill *Geranium dissectum* and *G. pyrenaicum*.
Drilidae						

Species	N	S	W	Status	Distribution	Notes
Drilus flavescens	1	0	1	Nationally Scarce a	Southern Restricted	Infrequently found and local. Recent records for only the Isle of Wight, Hampshire, Surrey, Kent and Sussex. Seldom found away from chalk grassland, the larvae feed on snails. The female is flightless.
Elateridae (Click Beetles)						
Agriotes sputator	1	1	1		Southern Widespread	Commonly found, in grassland habitats.
Agrypnus murinus	1	0	0		Southern Widespread	Commonly found in dry grassland.
Athous campyloides	1	0	0	Nationally Scarce b	Southern Restricted	Most records for this local click beetle are for South-east England. Adults are active at dusk for a short period in June and July. The wireworm larvae feed on plant roots. The species appears to be spreading in Britain.
Geotrupidae (Dung Beetles)						
Typhaeus typhoeus	1	1	0		Southern Widespread	Locally frequently found, in dung (mainly rabbit) on sandy soils.
Kateretidae						
Brachypterolus linariae	1	1	0		Southern Widespread	Commonly found. Breeds in the flowers of *Linaria* species.
Brachypterolus pulicarius	1	1	1		Universal	Frequently found. Associated with the flowers and seeds of Toadflax, *Linum* spp.
Lathridiidae						
Cartodere bifasciata	0	1	0		Universal	Very commonly found. Associated with decaying vegetable material.
Corticarina fuscula	0	0	1		Universal	Commonly found, in a variety of habitats.
Cortinicara gibbosa	0	1	0		Universal	Commonly found, in a variety of habitats.
Melyridae						
Anthocomus rufus	0	1	1		Southern Restricted	Commonly found. Reedbeds.
Axinotarsus marginalis	0	1	0		Southern Restricted	Commonly found. In grassland and woodland edge habitats.

Species	N	S	W	Status	Distribution	Notes
Cordylepherus viridis	1	1	1		Southern Restricted	Frequently found, in dry grassland.
Dasytes	0	1	1		Southern Restricted	Commonly found on flowers in hedges.
Malachius bipustulatus	1	1	0		Southern Widespread	Commonly found, on flowers in grassland and woodland.
Mordellidae (Tumbling Flower Beetles)						
Mordellistena acuticollis	1	0	1	RDB K	Southern Restricted	Infrequently found. Probably a recent colonist in Britain, this species was first recorded from Eriswell Lode near Mildenhall, West Suffolk and Shooter's Hill, West Kent in 1983 and 1984 respectively. It has recently been recorded from most counties in south-east England and East Anglia. Phytophagous. Associated with Mugwort *Artemisia vulgaris*, the larvae probably develop in the stems.
Mordellistena variegata	0	1	0		Southern Restricted	Locally frequently found. Adults found on flowers of hogweed and other species of umbels. Larval host uncertain but probably develop in plant stems.
Mordellochroa abdominalis	0	0	1		Southern Widespread	Frequently found, but local. Adults occur on flowers and larvae probably develop in dead wood or plant stems.
Nitidulidae (Pollen Beetles)						
Meligethes aeneus	1	1	1		Universal	Commonly found. Breeds in flowers of Brassicaceae.
Meligethes carinulatus	1	0	0		Southern Widespread	Frequently found on Bird's-foot Trefoil *Lotus corniculatus*.
Meligethes ruficornis	1	1	0		Southern Widespread	Infrequently found and localised. Breeds in flowers of *Ballota nigra*.
Oedemeridae						
Oedemera lurida	1	1	1		Southern Widespread	Commonly found. On a variety of flowers.

Species	N	S	W	Status	Distribution	Notes
Oedemera nobilis	0	1	0		Southern Widespread	Commonly found. On a variety of flowers.
Rhynchitidae (Weevils)						
Tatianaerhynchites aequatus	1	0	1		Universal	Commonly found. Feeds on hawthorn.
Temnocerus tomentosus	1	0	0	Nationally Scarce b	Southern Widespread	It occurs on various species of sallow and poplar, the larvae developing in the leaf buds. Local but widely distributed in England and Wales.
Scirtidae						
Cyphon laevipennis	0	0	1		Universal	Commonly found. Associated with *Phragmites* beds.
Scraptiidae						
Anaspis pulicaria	1	1	1		Southern Widespread	Commonly found, on a variety of flowers.
Staphylinidae (Rove Beetles)						
Astenus lyonessius	0	0	1		Southern Widespread	Commonly found. Amongst leaf litter in open-structured grassland.
Brachygluta helferi	0	0	1		Southern Widespread	Frequently found, amongst litter in saltmarshes. Assumed to be a predator.
Cypha longicornis	1	0	0		Universal	Commonly found, amongst litter on the ground.
Drusilla canaliculata	1	0	0		Southern Widespread	Commonly found, in dry grassland habitats.
Megalinus glabratus	1	0	0		Universal	Commonly found.
Metopsia clypeata	0	1	1		Universal	Commonly found. In moss and ground litter. Life history unknown.
Sepedophilus nigripennis	0	1	0		Universal	Commonly found, amongst litter on the ground.
Stenus aceris	1	0	0		Southern Widespread	Commonly found, but scarer in the north. At roots of grass and in moss in both grassland and woodland habitats, chiefly in lowland situations.
Stenus fulvicornis	1	0	0		Universal	Commonly found, in wetland habitats.

Species	N	S	W	Status	Distribution	Notes
Tachyporus atriceps	0	0	1		Universal	Commonly found. In grasslands amongst leaf litter and mosses.
Tachyporus hypnorum	1	1	0		Universal	Commonly found, amongst litter on the ground.
Tenebrionidae (Darkling Beetles)						
Isomira murina	1	1	1		Southern Widespread	Commonly found. In dry grassland.
Lagria hirta	1	0	0		Universal	Commonly found. Associated with hedgerows and scrub.
Nacerdes melanura	0	1	1		Universal	Commonly found. The Wharf-borer. Coastal. Breeds in old timber and driftwood along the shoreline.
DIPTERA (Flies)						
Asilidae (Robberflies)						
Dioctria atricapilla	0	1	0		Southern Widespread	Commonly found. Dry, grassy areas and heaths.
Dioctria baumhaueri	1	0	0		Southern Widespread	Commonly found. Dry, grassy areas and heaths at the edge of woodland.
Dioctria rufipes	1	1	1		Universal	Frequently found. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.
Dysmachus trigonus	0	1	0		Universal.	Locally commonly found. On heaths and dry, sandy grasslands in southern England. Coastal sand-dunes further north.
Leptogaster cylindrica	1	1	1		Southern Widespread.	Frequently found in long grass. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.
Machimus atricapillus	1	0	0		Southern Widespread	Commonly found. Dry grasslands and scrub.
Machimus cingulatus	0	0	1		Southern Widespread	Commonly found south of London, infrequent elsewhere. Dry grasslands, heaths and scrub.
Bibionidae (St Mark's Flies)						
Bibio johannis	1	1	1		Universal	Very commonly found. The larvae feed in grassland.
Dilophus febrilis	0	0	1		Universal	Very commonly found. The larvae feed in grassland.

Species	N	S	W	Status	Distribution	Notes
Bombylius major	1	1	0		Southern Widespread	Commonly found. A cleptoparasite of a variety of springtime ground-nesting solitary bees.
Chloropidae						
Lipara lucens	0	1	0		Southern Widespread	Commonly found. The larvae gall the flowering stem of Common Reed, making a cigar-gall.
Conopidae (Thick-headed Flies)						
Conops quadrifasciatus	1	0	0		Universal	Commonly found. A parasite of bumble bee workers.
Myopa strandi	0	0	1	RDB 3	Southern Restricted	Rarely found. The larvae are internal parasites of solitary bees of the genus *Andrena*.
Sicus ferrugineus	1	1	0		Universal	Commonly found. A parasite of bumble bee workers.
Zodion cinereum	1	1	0	Nationally Scarce b	Southern Widespread	Rarely found. A parasitoid of adult bees.
Dolichopodidae						
Machaerium maritimae	1	0	0		Universal	Commonly found. Saltmarshes.
Scellus notatus	1	1	0		Universal	Frequently found. Local, in woodland and scrub.
Empididae (Dance Flies)						
Empis tessellata	1	0	0		Universal	Commonly found. Both adults and larvae are predatory.
Limoniidae (Craneflies)						
Limonia nubeculosa	1	0	0		Universal	Commonly found. Damp woodlands. The larvae feed in dead wood.
Symplecta stictica	1	0	1		Universal	Commonly found, especially associated with marshy coasts.
Platystomatidae						
Platystoma seminationis	1	0	0		Universal	Commonly found. The larvae develop in decaying vegetable matter in damp places.
Sciomyzidae (Snail-killing Flies)						

Species	N	S	W	Status	Distribution	Notes
Coremacera marginata	1	1	1		Universal	Frequently found. Associated with dry habitats. The larvae prey on terrestrial snails.
Limnia unguicornis	1	1	1		Universal	Commonly found in both wet and dry grassland.
Pherbellia cinerella	1	0	1		Universal	Commonly found in grassland.
Pherbina coryleti	1	0	1		Universal	Frequently found. Associated with a variety of wet habitats. The larvae prey on both aquatic and terrestrial snails.
Trypetoptera punctulata	0	1	0		Universal	Frequently found in a wide range of habitats. Biology unknown.
Stratiomyidae (Soldierflies)						
Beris vallata	0	0	1		Universal	Commonly found in a variety of habitats.
Chloromyia formosa	1	1	1		Universal	Commonly found. Breeds in rotting vegetation.
Chorisops tibialis	1	1	0		Southern Widespread	Frequently found in woodland rides and scrub-edge.
Microchrysa flavicornis	1	0	0		Universal	Commonly found. Breeds in rotting vegetation.
Nemotelus notatus	1	1	1		Universal	Frequently found. A species of coastal wetlands.
Stratiomys singularior	1	0	0	Nationally Scarce	Southern Widespread	Locally frequently found. Associated with brackish ditches, hence usually coastal.
Syrphidae (Hoverflies)						
Cheilosia cynocephala	1	0	0	Nationally Scarce	Southern Widesrpread	Infrequently found. Associated with thistles in alkaline grasslands. Has been reared from *Carduus nutans*.
Cheilosia impressa	1	0	0		Universal	Frequently found. Damp woodlands.
Cheilosia proxima	1	0	0		Universal	Commonly found. The larvae mine roots of *Cirsium* spp. Unrecorded from Ireland.
Cheilosia vernalis	1	0	0		Universal	Commonly found. The larvae mine the roots of a number of perennial plants.

Species	N	S	W	Status	Distribution	Notes
Chrysotoxum bicinctum	1	1	0		Universal	Frequently found. Dry grasslands and heaths, often near scrub. Probably feeds on aphids on roots. There may also be an association with ants.
Chrysotoxum festivum	1	0	1		Southern Widespread	Infrequently found. Grasslands at the margins of woodland or scrub, particularly in southern England.
Eristalinus aeneus	1	1	1		Universal	Abundance: Commonly found very close to shore-line. Breeds in rotting vegetable matter, particularly seaweed.
Eristalinus sepulchralis	1	0	0		Universal	Commonly found. Organically rich pools, especially on coastal grazing marshes. The larvae are semi-aquatic, occurring in rotting vegetation and in water enriched with animal dung.
Eristalis arbustorum	1	1	1		Universal	Very commonly found. The larvae live in organically rich wet mud.
Eristalis horticola	1	0	0		Universal	Commonly found. Local towards the north of the U.K.. The larvae live in organically rich wet mud.
Eristalis intricarius	1	0	0		Universal	Commonly found. Often in woodland clearings.
Eristalis pertinax	1	0	0		Universal	Very commonly found. The larvae live in organically rich wet mud.
Eupeodes corollae	1	0	0		Universal	Very commonly found everywhere. The larvae feed on aphids. A migratory species.
Eupeodes luniger	1	0	1		Universal	Commonly found. The larvae prey on aphids on conifers.
Helophilus pendulus	1	0	0		Universal	Very commonly found. The larvae live in organically rich wet mud.
Helophilus trivittatus	1	0	1		Universal	Infrequently found. Most often associated with grazing marshes and coastal meadows. Increased in distribution and found over many more habitat types recently.
Melanostoma mellinum	1	0	1		Universal	Very commonly found. A grassland species.
Melanostoma scalare	0	0	1		Universal	Very commonly found. A grassland species.
Myathropa florea	1	0	1		Universal	Commonly found. The larvae live in wet, decaying leaves.

Species	N	S	W	Status	Distribution	Notes
Paragus haemorrhous	0	1	0		Universal	Commonly found. Associated with patches of bare ground in short grassland.
Pipizella maculipennis	0	0	1	RDB 3	Southern Widespread	Rarely found. A species of dry grassland and woodland. The larvae feed on aphids on roots.
Pipizella viduata	1	1	1		Universal	Commonly found. A species of dry grassland. The larvae feed on aphids on umbellifer roots.
Pipizella virens	1	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. Possible association with aphids on roots of umbellifers.
Sphaerophoria rueppellii	1	0	1		Universal	Locally commonly found in the south-east. Uncommonly found elsewhere. Usually In dry grassland, although it has been also found along the edges of saltmarsh.
Sphaerophoria scripta	1	1	1		Universal	Very commonly found in the southern half of the British Isles. A grassland species, the larvae feed on aphids and Homoptera living in the ground layer.
Sphaerophoria taeniata	1	0	0		Universal	Frequently found. Associated with wet meadows.
Syritta pipiens	1	1	0		Universal	Very commonly found in most places throughout Britain. The larvae live in decaying vegetation.
Syrphus ribesii	1	0	0		Universal	Very commonly found. A migratory species. The larvae feed on aphids.
Tropidia scita	1	1	0		Universal	Locally common. A species of lush fen and marsh.
Xanthogramma pedissequum	0	1	0		Southern Widespread	Frequently found on dry grasslands. There is an association with *Lasius* ant nests.
Xylota segnis	1	0	0		Universal	Commonly found. Woodlands and hedgerows. A dead-wood breeding species which will even use sawdust.
Tabanidae (Horseflies)						
Chrysops relictus	1	1	1		Universal	Frequently found. Associated with wet woodlands. Commoner in Scotland than *C. caecutiens*.

Species	N	S	W	Status	Distribution	Notes
Cistogaster globosa	1	1	0	RDB 1	Southern Restricted	Locally frequent, becoming more so. Dry grassland with bare ground. Parasitic on Bishops Mitre Bug.
Gymnosoma nitens	0	1	0	RDB 1	Southern Restricted	Infrequently found, and very local. In common with many other tachind flies associated with Hemiptera this species has become more widespread in the recent component of the fauna of Thames corridor gravel terrace sites. Parasitises *Sciocoris curtisans* and possibly other shield-bugs.
Tephritidae (Picture-wing Flies)						
Campiglossa misella	1	0	0		Southern Restricted	Locally frequently found. Larvae attack the flower spike of *Artemisia vulgaris*, inducing a stem gall in the first generation and developing in the capitula in the second generation.
Campiglossa plantaginis	1	0	0		Southern Widespread	Found locally in southern Britain. Mainly found in coastal districts, especially saltmarshes. Associated with *Artemisia maritimia* and *A. vulgaris*. Larvae attack the capitula of the host plants. Has als obeen found in the Brecks, where it was associated with Ragwort.
Chaetorellia jaceae	1	0	0		Southern Restricted	Frequently found. The larvae develop in the seed heads of Asteraceae.
Merzomyia westermanni	1	0	1	Nationally scarce	Southern Restricted	Frequently found. Local in south-east England but perhaps more frequent than originally thought. The larvae develop in the flower-heads of ragwort *Senecio* species.
Orellia falcata	0	1	0	Nationally Scarce	Southern Restricted	Infrequently found. The larvae develop in the roots of Goat's Beard, *Tragopogon pratensis*.
Tephritis divisa	1	0	0		Southern Restricted	Commonly found. Recent arrival from southern Europe. Associated with *Picris echioides*.
Urophora cardui	0	1	0		Southern Restricted	Commonly found, on Creeping Thistles *Cirsium vulgare*.

Species	N	S	W	Status	Distribution	Notes
Urophora quadrifasciata	1	0	0		Southern Restricted	Commonly found on Hardheads *Centaurea nigra*.
Therevidae (Stiletto Flies)						
Thereva nobilitata	0	1	0		Universal	Commonly found. The commonest Therevid fly, often associated with dry grasslands. The larva lives in loose soil.
Tipulidae (Craneflies)						
Nephrotoma appendiculata	0	0	1		Universal	Commonly found. A species of dry grassland.
Nephrotoma flavescens	1	1	0		Universal	Commonly found. A species of dry grasslands.
Tipula oleracea	1	0	1		Universal	Commonly found. Associated with pastures on wet soils.
Ulidiidae						
Dorycera graminum	1	0	0	RDB 3. UK BAP	Southern Restricted	Frequently found. Associated with taller grasslands, often dry ones. However, the larval food plant is unknown; it may be the roots or inflorescences of grasses.
HYMENOPTERA SYMPHYTA (Sawflies)						
Argidae						
Arge cyanocrocea	0	0	1		Southern Widespread	The Rose Sawfly. The larvae fed on the leaves of Rosacae, especially brambles.
Tenthredinidae						
Athalia rosae	1	0	0		Southern Widespread	Very commonly found. The larva feeds on various species of crucifer, and was formerly a pest of turnips.
HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)						
Chalcididae (Parasitic Wasps)						
Brachymeria minuta	1	0	0		Southern Widespread	Infrequently found. An internal parasite of sarcophagid flies.
Gasteruptiidae (Parasitic Wasps)						

Species	N	S	W	Status	Distribution	Notes
Gasteruption jaculator	1	0	0		Southern Restricted	Commonly found. A clepto-parasite of stem-nesting bees.
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)						
Andrenidae (Mining Bees)						
Andrena alfkenella	1	0	0	RDB 3	Southern Restricted	Infrequently found. Strongly associated with calcareous grassland in south-eastern England, also associated with heathland edge in south-western England. Polylectic.
Andrena bicolor	0	1	1		Universal	Very commonly found. Polylectic. Ground nesting.
Andrena carantonica	0	0	1		Universal	Commonly found. Several females may share a common burrow entrance. Polylectic.
Andrena chrysosceles	0	0	1		Southern Widespread.	Commonly found. Especially associated with clay woodlands. Polylectic. Ground nesting.
Andrena dorsata	1	1	1		Southern Widespread	Commonly found. Often the dominant species in southern Britain. Polylectic.
Andrena flavipes	1	1	1		Southern Restricted.	Commonly found. Forms very large colonies, especially in bare ground. Polylectic. Ground nesting.
Andrena haemorrhoa	0	1	0		Universal	Commonly found. Females nest singly but males often congregate on blackthorn and hawthorn blossoms. Polylectic. Ground nesting.
Andrena labialis	1	0	1		Southern Widespread	Local species of old meadowlands. Oligolectic on the flowers of Fabacaea.
Andrena labiata	0	1	0	Nationally Scarce a	Southern Restricted	Locally frequent. Old meadowland and heathy grassland species. Polylectic, although it is often found associated with the flowers of Germander Speedwell, *Veronica chamaedrys*.
Andrena minutula	0	1	0		Universal	Commonly found. Polylectic. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Andrena minutuloides	1	1	1	Nationally Scarce a	Southern Restricted	Infrequently found. Strongly associated with sandy and calcareous grasslands. Polylectic.
Andrena nigroaenea	1	0	0		Universal.	Commonly found. Polylectic. Ground nesting.
Andrena nitida	1	1	0		Southern Widespread	Commonly found. A species of meadows. Polylectic. Ground nesting.
Andrena pilipes s.s	0	0	1	Nationally Scarce b	Southern Restricted.	A recent split, this is the commoner of two species formerly known as *Andrena pilipes*.
Andrena praecox	1	1	0		Southern Widespread	Locally frequently found. Oligolectic on blossom of sallows.
Andrena semilaevis	1	0	0		Universal	Commonly found. Polylectic, although with an apparent preference for Apiaceae.
Andrena wilkella	1	1	1		Universal	Frequently found in unimproved meadows. Oligolectic on Fabaceae. Ground nesting.
Panurgus calcaratus	1	1	0		Southern Widespread	Locally frequently found. Oligolectic, associated with yellow flowered Asteraceae (composites). Ground nesting.
Apidae (Bees)						
Anthophora bimaculata	1	1	1		Southern Restricted.	Locally commonly found in heathy localities. Nests in the ground. Polylectic.
Anthophora plumipes	0	1	0		Southern Widespread	Commonly found. Nests in the ground or cliffs and walls.
Bombus hortorum	1	1	1		Universal	Very commonly found. Polylectic. Nests underground in cavities.
Bombus humilis	1	0	1	UK BAP	Southern Widespread	BAP species. Frequently found. A declining species, more frequent in coastal localities of the south-west. Associated with taller grasslands, but with plenty of perennial flowers present. Surface nesting.
Bombus lapidarius	1	1	1		Universal	Very commonly found. Nests underground in cavities. Polylectic.
Bombus pascuorum	1	1	1		Universal	Very commonly found. Polylectic. Nests in surface litter.
Bombus pratorum	1	1	1		Universal	Very commonly found. Polylectic. Nests underground as well as in aerial cavities, including bird boxes.

Species	N	S	W	Status	Distribution	Notes
Bombus terrestris	1	1	1		Universal	Very commonly found. Polylectic. Nests underground in cavities.
Bombus vestalis	1	0	0		Southern Widespread	Commonly found. Breeds in nests of B. terrestris.
Ceratina cyanea	1	1	1	RDB 3	Southern Restricted	Locally frequently found. This small blue bee is our only Carpenter Bee, so called because of their habit of drilling burrows in wood in which to make their nests. They do this with their strong mandibles. *Ceratina* drills out the soft pith of dead ramble stems, both for nests which are provisioned during May and June, and for overwintering by the adults which emerge from these summer nests. Overwintering is communal, unmated males and females pack into drilled stems, following in the one which made the burrow. I have found up to ten adults in one stem.
Nomada fabriciana	0	0	1		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada flavoguttata	1	1	0		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada flavopicta	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found. A cleptoparasite of *Mellitta* bees.
Nomada fucata	1	0	1	Nationally Scarce a	Southern Restricted.	Frequently found. Becoming much more widespread recently. The host of this species, *Andrena flavipes*, has always been more widespread than the *Nomada*.
Nomada fulvicornis	1	1	0	RDB 3	Southern Restricted	Infrequently found. Predominantly a heathland bee, as are its host species, *Andrena bimaculata* and *A. tibialis*.
Nomada goodeniana	1	1	0		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada hirtipes	1	0	0	RDB 3	Southern Restricted	Rarely found. A Cleptoparasite of the rare mining bee *Andrena bucephala*.

Species	N	S	W	Status	Distribution	Notes
Nomada marshamella	0	1	0		Universal	Commonly found. Parasitises several *Andrena* species.
Chrysididae (Cuckoo Wasps)						
Chyrsis viridula	1	1	0		Southern Widespread.	Locally common. Parasitises the Eumenid wasps of the Genus *Odynerus*.
Hedychrum niemelai	1	0	0		Southern Restricted	Frequently found, but local. Sandy places. A cleptoparasite of *Cerceris* spp.. I have found the species associated with wind-blown sand deposits on Cornish sea cliffs. A species which is increasing its range at the moment.
Pseudomalus auratus	1	0	0		Southern Widespread	Frequently found, particularly from reared nests. Parasitises stem nesting aculeates.
Pseudospinola neglecta	0	1	0		Southern Widespread	Locally frequent. Parasitises the Eumenid wasp *Odynerus spinipes* and probably *O. melanocephala*.
Colletidae (Bees)						
Colletes daviesanus	0	0	1		Universal	Locally common, sometimes in extensive colonies on sandstone cliffs. Oligolectic on Asteracea.
Colletes halophilus	1	1	1	Nationally Scarce a. UK BAP	Southern Restricted.	A UK BAP species. Locally frequently found. The female gathers pollen from the flowers of Sea Aster, *Aster tripolium*. Nests are made in dry clay banks and sandy areas.
Colletes marginatus	0	0	1	Nationally Scarce a	Southern Widespread	Locally common in coastal dunes in southern Britain, with a population in the East Anglian Brecks. Often forages at Bramble. Polylectic although Westrich lists it as oligiolectic on Fabaceae. Ground nesting.
Colletes similis	0	1	0		Southern Widespread	Usually infrequently found, although the commonest Colletes on the coasts of Devon and Cornwall. Ground nesting. Oligolectic on Asteraceae.
Hylaeus brevicornis	1	1	0		Southern Widespread	Commonly found. Polylectic. Dead-stem nesting.

Species	N	S	W	Status	Distribution	Notes
Hylaeus cornutus	1	0	0	Nationally Scarce a	Southern Restricted	Frequently found. A species of open woodland edge habitat. Polylectic, but often associated with umbellifers. Become much commoner during the past ten years. Nests in hollow stems.
Hylaeus dilatatus	1	0	0		Southern Restricted	Locally frequently found. Nests in dead Bramble stems. Polylectic. Previously known as *Hylaeus annularis*.
Hylaeus hyalinatus	1	0	0		Southern Widespread	Commonly found, especially in coastal situations.
Hylaeus pectoralis	0	1	0		Southern Restricted	Infrequently found. A species of dry reedbeds and associated grassland. Utilises the old gall-chambers of the fly *Lipara lucens* on Common Reed, *Phragmites australis*, as a nesting site. Polylectic.
Crabronidae (Solitary Wasps)						
Astata boops	1	0	0		Southern Restricted	Frequently found, but local. Nests in bare, often sandy, places. Preys on shieldbug nymphs. Ground nesting.
Cerceris rybyensis	0	0	1		Southern Restricted	Locally commonly found. Heathland and downland. Preys on various solitary bees. Ground nesting.
Diodontus minutus	1	1	0		Southern Widespread	Commonly found in sandy places. Preys on aphids. Ground nesting.
Dryudella pinguis	0	0	1		Universal	Infrequently found. Dry, sandy places. Preys on shieldbug and Lygaeid bug nymphs. Ground nesting.
Ectemnius continuus	1	1	1		Universal	Commonly found in a variety of habitats. Dead-wood nesting. Preys on flies.
Ectemnius dives	1	0	0	Nationally Scarce b	Southern Widespread	Local and infrequently found. This species has been increasing its range and frequency over the past twenty years. Dead wood nesting. Hunts flies.
Ectemnius lituratus	0	1	0		Southern Widespread	Commonly found. Dead-wood nesting. Hunts flies.

Species	N	S	W	Status	Distribution	Notes
Ectemnius sexcinctus	0	0	1	Nationally Scarce b	Southern Widespread	Occasional specimens, but distributed widely in southern England. Dead-wood nesting. Hunts flies.
Entomognathus brevis	1	0	1		Southern Widespread	Commonly found in sandy places. Preys on small leaf-beetles (Chrysomellidae). Ground nesting.
Lestiphorus bicinctus	1	0	0	Nationally Scarce b	Southern Restricted	Infrequently found and local. Preys on froghoppers (Hemiptera Homoptera)
Lindenius albilabris	0	1	1		Universal	Commonly found. Preys on Mirid bugs or sometimes small Diptera. Nests in hard-packed bare ground.
Nysson trimaculatus	1	0	0	Nationally Scarce b	Southern Widespread	Infrequently found, a cleptoparasite of *Gorytes* spp.
Oxybelus uniglumis	0	1	0		Southern Widespread	Very commonly found in sandy places. Preys on flies. Ground nesting.
Passaloecus gracilis	1	0	0		Southern Widespread	Infrequently found. Preys on aphids on herbaceous plants. Dead wood nesting.
Pemphredon inornata	0	1	0		Southern Widespread	Commonly found. Preys on aphids. Dead-wood nesting.
Pemphredon lethifer	1	0	1		Southern Widespread	Commonly found. Preys on aphids. Nests in the soft pith of dead stems, such as bramble. The main chamber is helical down the stem, with side chambers dropping off this.
Psenulus pallipes	1	0	0		Southern Widespread	Infrequently found. Associated with woodland and hedgerows. Preys on aphids and nests in dead wood.
Psenulus schencki	1	0	0	Nationally Scarce a	Southern Restricted	Rarely found. Nests in hollow dead stems, although scarce it seems to have no strong habitat preference. Preys on Psyllid bugs (Homoptera)
Trypoxylon attenuatum	1	1	0		Universal	Commonly found. Preys on small spiders. Stem nesting.
Dryinidae (Solitary Waps)						
Gonatopus bicolor	0	0	1		Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae).
Formicidae (Ants)						

Species	N	S	W	Status	Distribution	Notes
Formica cunicularia	1	1	1		Southern Restricted	Locally commonly found. Southern heathland, downland and coastal localities.
Formica fusca	1	0	0		Universal	Commonly found in many habitats, although largely replaced by *F. lemani* towards the north.
Lasius flavus	0	1	0		Universal	Commonly found. The large, dome-shaped nests are an indicator of long-established pasture.
Lasius niger s.s.	1	1	1		Universal	Very commonly found. Dry habitats.
Leptothorax acervorum	1	0	0		Universal	Commonly found in many habitats.
Myrmica ruginodis	1	0	0		Universal	Commonly found in many habitats.
Myrmica sabuleti	1	0	1		Universal	Locally commonly found. Short turf and bare ground.
Myrmica scabrinodis	1	1	1		Universal	Commonly found in a variety of open habitats.
Myrmica specioides	1	1	0	RDB 3	Southern Restricted	Infrequently found. Associated with sparsely vegetated soils, often shingle or gravel. Increasing range during the 2000's.
Ponera coarctata	0	0	1	Nationally Scarce b	Southern Restricted	Rarely found. Largely associated with coastal areas with warmth. Subterranean.
Halicitdae (Mining Bees)						
Halictus rubicundus	1	0	0		Universal	Commonly found. A eusocial species. Ground nesting. Polylectic.
Halictus tumulorum	1	0	0		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum albipes	0	1	0		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum calceatum	1	1	1		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum leucozonium	1	0	1		Southern Widespread	Commonly found in a variety of habitats. Polylectic. Ground nesting.
Lasioglossum malachurum	0	0	1	Nationally Scarce a	Southern Restricted	Commonly found. Eusocial species which forms large colonies. Formerly, a largely coastal species. Increased its range during the 1990s. Does not merit Nationally Scarce status now. Polylectic.

Species	N	S	W	Status	Distribution	Notes
Lasioglossum minutissimum	1	1	0		Southern Restricted	Locally frequently found. Associated with sandy places. Polylectic.
Lasioglossum pauperatum	0	1	0	RDB 3	Southern Restricted	Infrequently found. Largely associated with warm areas on sandy or chalky soils. Polylectic.
Lasioglossum pauxillum	1	1	1	Nationally Scarce a	Southern Restricted	Commonly found. Polylectic and eusocial. Became much commoner during the 1990s, does not merit Nationally Scarce status now. Ground nesting.
Lasioglossum punctatissimum	1	1	0		Southern Widespread	Commonly found. Sandy places. Polylectic.
Lasioglossum puncticolle	1	1	1	Nationally Scarce b	Southern Restricted	Locally frequently found. A species of clay meadows and woodland rides. Polylectic. Ground-nesting.
Lasioglossum villosulum	1	1	0		Universal	Commonly found. Polylectic. Ground nesting.
Sphecodes crassus	0	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. Has been difficult to separate from closely related species. It could well be more widespread than previously thought. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes ephippius	1	0	1		Southern Widespread	Commonly found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes geoffrellus	0	1	0		Universal	Commonly found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes monilicornis	0	1	0		Universal	Commonly found. Cleptoparasitic on *Lasioglossum* and *Halictus* sp..
Sphecodes pellucidus	0	1	0		Universal.	Commonly found in sandy situations where its host, *Andrena barbilabris,* occurs.
Sphecodes puncticeps	0	1	0		Southern Widespread.	Infrequently found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes reticulatus	1	0	0	Nationally Scarce a	Southern Restricted.	Locally frequently found. Associated with grasslands on light soils. The host species are not clear, as it is found where its recorded host, *Lasioglosssum prasinum,* does not occur.
Sphecodes rubicundus	1	0	0	Nationally Scarce a	Southern Restricted	Infrequently found. A cleptoparasite of *Andrena labialis*, a bee of old meadowland; it may also cleptoparasitise *Andrena flavipes*.

Species	N	S	W	Status	Distribution	Notes
Megachilidae (Leafcutter and Mason Bees)						
Anthidium manicatum	1	0	0		Southern Widespread	Locally frequent, particularly in gardens. Polylectic. Cavity nesting.
Coelioxys conoidea	1	0	1		Southern Restricted.	Locally frequently found. Cleptoparasite of *Megachile maritima*.
Hoplitis claviventris	0	0	1		Southern Widespread	Infrequently found. Uses dead bramble stems in which to make its nest. Polylectic.
Megachile centuncularis	1	0	0		Universal	Locally frequently found. A species which has apparently declined greatly in the last hundred years. Polylectic. Cavity nesting.
Megachile leachella	1	1	1	Nationally Scarce b	Southern Widespread	Locally very common. Associated with duneland sites, but also known inland on the Brecks. Ground nesting. Polylectic.
Megachile versicolor	0	0	1		Universal	Commonly found. One of the leafcutter bees from the way it lines its nest chamber with sections of cut leaf. Any leaf will do, provided that it is supple. The sides are made from oval pieces, the ends from round ones. Cavity nesting. Polylectic.
Megachile willughbiella	0	0	1		Universal	Commonly found. Cavity and ground nesting. Polylectic.
Osmia caerulescens	0	0	1		Southern Widespread	Locally commonly found. Cavity nesting. Polylectic.
Osmia bicornis (rufa)	1	0	0		Universal	Locally common. Cavity nesting. Polylectic.
Osmia spinulosa	1	1	1		Southern Restricted	Locally frequently found on southern calcareous grasslands. Nest in snail-shells. Oligolectic on Asteraceae.Formerly known as *Hoplitis spinulosa*.
Stelis punctulatissima	1	0	0		Southern Widespread	Infrequently found. Often in gardens where it is as a cleptoparasite of *Anthidium manicatum*.
Melittidae (Bees)						
Melitta leporina	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found. Associated with legumes, especially White Clover, *Trifolium repens*. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Melitta tricincta	1	0	1	Nationally Scarce b	Southern Restricted	Locally commonly found. Oligolectic. Very strongly associated with Red Bartsia, *Odontites verna*, which provides the pollen with which the female stocks her nest. Ground nesting.
Pompilidae (Spider-hunting Wasps)						
Agenioidus cinctellus	1	0	0		Southern Restricted	Infrequently found. A species of cracks and crevices, such as upturned root-plates. Cavity nesting.
Anoplius infuscatus	0	1	0		Southern Widespread	Locally common on damp heaths and dunes. Preys on wolf spiders (Lycosidae). Ground nesting.
Priocnemis cordivalvata	1	0	0	Nationally Scarce b	Southern Widespread	A species of rides in mature broadleaf woodland, occasionally coppice. Ground nesting.
Sphecidae (Solitary Wasps)						
Ammophila sabulosa	1	0	1		Southern Widespread	Commonly found. Associated with sandy, and many coastal, localities. Hunts caterpillars. Ground nesting.
Tiphiidae (Solitary Wasps)						
Tiphia femorata	1	0	1		Southern Restricted.	Locally commonly found. Sandy places. Parasitises larvae of scarabaeid beetles.
Vespidae (Social and Potter Wasps)						
Ancistrocerus gazella	1	0	0		Southern Widespread	Commonly found. Nests in a variety of cavities. Provisions its nest with small caterpillars.
Ancistrocerus parietum	1	0	0		Universal	Infrequently found. Preys on lepidopteran larvae.
Dolichovespula sylvestris	0	0	1		Universal	Commonly found. Aerial nesting.
Odynerus melanocephalus	1	0	1	Nationally Scarce a. UK BA	Southern Restricted	Locally frequent. BAP species. Preys on weevil larvae, *Hypera*. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Odynerus spinipes	1	1	0		Southern Widespread	Erratic but can be commonly found in a locality. Can apparently suddenly appear after many years' absence- and then disappear. Makes large colonies on exposed banks. Each nest entrance is formed in the shape of a long chimney curving away from the bank. Preys on weevil larvae, *Hypera*.
Symmorphus bifasciatus	1	0	0		Southern Widespread	Locally frequently found in damp places. Nests in aerial cavities and dead wood. Provisions nest with larvae of leaf betles (Chrysomelidae).

APPENDIX B
Conservation Status Categories, Distribution and Abundance Terminology for Insects

Conservation status categories

RDB (Red Data Book) categories are based upon the most modern work, usually one of the English Nature Research and Survey in Nature Conservation reviews. Where these do not exist the category given in Shirt, D.B., 1987 The British Red Data Books: 2 is given. These categories may require revision in the light of new information but a new Red Data Book has yet to be compiled. Such revisions are indicated as p(rovisional). The new Red Data Book categories will be based on threat, of which distribution is only one part. This is likely to lead to a far more meaningful conservation assessment, as the number of squares recorded for any one species is highly susceptible to recorder effort, especially as data accumulates over time.

RDB 1. Endangered. Species currently (post 1970) known to exist in five or fewer ten-kilometre squares.

RDB 2. Vulnerable. Species in severely declining or vulnerable habitats, or of low known populations. Known to exist (post 1970) in ten, or fewer, ten-kilometre squares.

RDB 3. Rare. Species with small populations, not at present Endangered or Vulnerable, but which are felt to be at risk. Species currently known to exist (post 1970) in fifteen, or fewer, ten-kilometre squares.

RDB K. Species of undoubted RDB rank, but with insufficient information for accurate placement; includes possible recent arrivals.

Nationally Scarce. Species currently (post 1970) known to exist in one hundred, or fewer, ten-kilometre squares.

In some groups these are further sub-divided into:-

Nationally Scarce a. Species currently (post 1970) known to exist in thirty, or fewer, ten-kilometre squares.

Nationally Scarce b. Species currently known to exist in thirty-one to one hundred ten-kilometre squares.

Distribution categories

Distribution refers solely to the geographical extent of a species in the British Isles. Considerable confusion has been caused in the past by the varying meanings given to many assessments of species where geographic distribution has been confused with local abundance.

Distribution comments are based upon national status as far as is known (e.g. published distribution maps or the most recent taxonomic/ecological work giving distribution information). This may be supplemented by personal knowledge of the species.

A distribution classification, based on the known distribution range, is being developed. Where possible a provisional national distribution range status under this system is given. The basic system has been to divide the British Isles into thirds, largely ignoring the influence of altitude. The lines delineating these thirds run approximately:

i). Along a line from the Wash to the Severn and including South Wales.

ii) Along a line running through the Scottish Borders.

Universal. Distributed throughout England and Wales, with at least some extension into central and northern Scotland.

Widespread. Distributed in about three-quarters of England and Wales, perhaps with a few records in southern Scotland, but not significantly found in the northern third (Southern Widespread) or southern third (Northern Widespread) of the British Isles. (NB Northern Widespread species are found in Scotland as well.)

Restricted. Distributed in the southern (Southern Restricted) or northern (Northern Restricted) third of the British Isles only.

Abundance Comments

These often form the first part of the 'Notes' in the species information. An attempt has been made to make something akin to the well-established DAFOR system for botanical abundance recording, but with just four categories. These rate the expectation of finding the species, if all its life-cycle resource requirements and temperature and humidity regimes are apparently met on a site.

i) **Commonly found.** An experienced observer would expect to find the species 90% or more of the time where all its requirements are met.

ii) **Frequently found.** An experienced observer would expect to find the species 60% or more of the time where all its requirements are met.

iii) **Infrequently found.** An experienced observer would expect to find the species 10% or more of the time where all its requirements are met.

iv) **Rarely found.** An experienced observer would expect to find the species less than 10% of the time where all its requirements are met.

Abundance comments are much more subjective than distribution comments, being dependent upon the precise timing of survey visits and the timing of emergence of the insect species, as well as the experience of the observer. The method of recording, e.g. by sight or hand-netting, sweeping, beating, malaise trap, pan trap, may also affect the observed abundance. It is assumed that recording takes place under favourable conditions of habitat, weather and season. Often a species appears to be rarely found, until the particular way of looking for it is discovered, when it proves to be much more prevalent than previously thought.

Some species, however, seem to exist in low numbers at all times in all suitable places. This may reflect the species' position in its particular ecological pyramid. The abundance may have no connection with the distribution status; some Red Data Book species are numerous in their particular locations: some Universal species may only ever be found as singletons. Comments under this heading rely heavily upon the observer's accumulated experience as the rating given is a measure of the expectation of finding the species in a suitable habitat. Species living towards the edge of their range are often less frequent than they are in the middle of their range.

Specialist Terms for Ants, Bees and Wasps

Cleptoparasitic: A species taking over the stored provisions of another species to feed its young. This usually involves the cleptoparasite laying an egg in the nest of the host, but may involve oviposition on prey being transported by the host.

Socially Parasitic: The queens of some social aculeates do not initiate their own nests from scratch, but take over established nests of other species. Sometimes this results in the gradual replacement of the workers of one species by another. In other cases the parasite does not produce its own workers and the nest just produces males and females of the invading parasite before it dies out. In some ant species the chain of socially parasitic species may have several links.

Nesting situations: Bees and wasps may construct their nesting chambers in the ground (ground nesting) or in aerial situations (aerial nesting). Such aerial nests may be constructed in dead wood (dead-wood nesting), dead bramble stems or similar pith-filled stems (stem nesting) or in a variety of cavities (cavity nesting).

Nest provisioning terms: These relate (in bees) to the preferred sources of pollen for provisioning the

nest. Such resources may be very specific for some species. Nectar sources are not so clearly defined, although bees with longer tongues can forage at flowers with longer nectaries. Such flowers often have more concentrated nectar. The structure of the anthers and stigma is often related to the length of the tongue of the preferred pollinating insect.

Oligolectic: Bees which confine their pollen gathering activities to one species of plant, or a closely-related group of plants.

Polylectic: Bees which forage for pollen at a variety of different plants and show no particular preference.

Social organisation: The majority of bee and wasp species are **solitary**. One female provisions the nest and lays her eggs on the provisions. A number of solitary nesting insects may use the same small area when they are said to nest **colonially**. **Eusocial** species have a founding female who lays all the eggs, but the first insects to hatch (females) stay and help run the nest. At the end of the season males and females are produced. These mate and the newly mated females start their own nests. Usually only mated females overwinter. Some ant colonies have several mated females (queens).

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Annex EDP 28
Invertebrate Survey and Assessment of the London Paramount Entertainment Resort 2015 (Edwards Ecological Services, 2015)

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Invertebrate Survey and Assessment of the London Paramount Entertainment Resort

2015

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Invertebrate Survey and Assessment of the London Paramount Entertainment Resort 2015

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1. INTRODUCTION

1. 1. Background

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH' or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.1.2 The Invertebrate Survey was undertaken by Edwards Ecological Services Ltd and Arachne Ltd on behalf of CBA. This report details the methodology, results and evaluation of the London Paramount survey undertaken between March and September 2015. It also incorporates the findings of an earlier survey (2012) by Edwards Ecological Services.

1.2 Scope of Survey

1.2.1 The scope of the survey encompassed:

Primary targets, with co-ordinating recorder: Isopoda (Woodlice); Diplopoda (Millipedes); Chilopoda (Centipedes); Aranae (Spiders); Opilones (Harvestmen): Paul Lee (P.L.); Odonata (Dragonflies and Damselflies): Jovita Kuanang (J.K.); Orthoptera (Grasshoppers and Crickets): Mike Edwards (M.E.); Hemiptera (Bugs) Peter Hodge (P.H.); Lepidoptera (Butterflies and Moths) Graham Collins; Coleoptera (Beetles) Peter Hodge; Diptera (Flies, not all groups) Mike Edwards; aculeate Hymenoptera (Ants bees and wasps): Mike Edwards.

As seen, but not targeted for survey: Mollusca (snails); Trichoptera (Caddis flies); ; Neuroptera and allies (Lacewings, Scorpionflies); Dermaptera (Earwigs); Hymenoptera Symphyta (Sawflies). All surveyors contributed records to all insect groups.

1.2.2 Survey was primarily by direct searches using hand-netting, beating and direct observation. Some sampling with a suction-sampler was employed, particularly on areas of short, warm vegetation. Runs of Malaise traps and pitfall traps were also employed. The Malaise traps were set in, or as close to as possible, the main wetland areas on the primary site (not Botany Marshes East). The pitfall traps sampled both wet and dry habitats.

1.2.3 Data from an earlier survey (2012) which targeted Isopoda (Woodlice); Diplopoda (Millipedes); Chilopoda (Centipedes); Aranae (Spiders); Opilones (Harvestmen); Orthoptera (Grasshoppers and Crickets); Hemiptera (Bugs); Coleoptera (Beetles); Diptera (Flies, not all groups); aculeate Hymenoptera (Ants bees and wasps,) has been included with this report as it provides better coverage of a wider area than just that covered during 2015.

1.2.4 The survey ran for 7 months between March and September, with three or four visits to the site made by most team members in each month, depending on the target groups.

1.3 Survey Limitations.

1.3.1 These mostly relate to the availability of days without rain and which were warm for the time of year. Invertebrates are most readily found under dry, mild conditions with at least some sunshine. All survey days had at least half the time with such conditions, most were dry and fine throughout.

1.3.2 These direct searches were backed by two sets of Malaise traps and runs of pitfall traps. Neither trapping system is as closely dependent on extended weather conditions as they operate over a full 24 hrs. However, being static they depend greatly upon informed siting.

1.3.3 No attempt was made to provide population numbers for any invertebrate sampled.

1.3.4 The red-line area was large and increased sampling effort would, inevitably, have produced more records for more of the component areas. However, it must be stated that this survey ranks very highly in terms of survey effort compared with all the others we have been involved with.

1.4 Key findings.

1.4. 1 The entire site should be considered as 2 different ecological systems:

a) A dry, well-drained habitat, predominately grassland but with a scrub element and patches of intermittent disturbance, this is substantially present both north and south of Manor Way

b) A wetland habitat, with greater or lesser water flow through individual areas. This is represented mostly north of Manor Way, although there are small examples to the south.

1.4.2 Both these systems are of high (National) ecological importance. This means that the entire site is of high (National) ecological importance. It is also of high importance when considered among local sites for which there is information.

1.4.3 The dry habitat to the north of Manor Way largely reflects the use made of the former grazing marsh as a dump for waste materials from the local cement industry. In this context it is an extension of the dry habitat present before the extensive quarrying associated with the cement industry and which is present in remnant form along the upper walls of the quarries. The dumping of material from quarrying activities including overburden, within the quarries themselves and adjacent areas has also contributed to the modern available habitat.

1.4.4 The only sample area north of Manor Way with a good, reliable supply of clean water is the CTRL wetlands and this has the highest value wetland insect fauna. It also has a low level of influence from leachate, partly because the direction of flow of the water carries leachate away from the area, not into it.

1.4.5 Black Duck Marsh has a very variable water regime and is considerably affected by leachate along its eastern margin. Consequently the fauna associated with this area is of lower value.

1.4.6 The line of seepages along the edge of the CTRL car parks in area 18 has a small, but significant wetland interest. The winter flow from these also influences the grassland towards the railway line.

1.4.7 The narrow fringing area of saltmarsh and brackish ditches between along the Thames itself - and between the western sea-walls - has its own high-value fauna.

2. THE SAMPLE AREAS

2.1 Overview

2.1.1 These were chosen to provide good a coverage of all areas and habitat types which were likely to be impacted within the red line. Unless noted otherwise, all areas were visited by all surveyors. Three of the areas had been the targets for an earlier (2012) survey and these were not re-visited by three of the surveyors during 2015, except for some specific sites for spiders. This allowed greater concentration by these surveyors (3) on the unknown sites. Two surveyors, covering groups not covered by the first three, had a wider geographic brief, but consequently spent less time on some of the other areas. Unless noted otherwise, all areas were visited by all surveyors. We consider that this approach provided the best, extensive coverage, both in terms of geographic spread and taxonomic coverage, within the resources available.

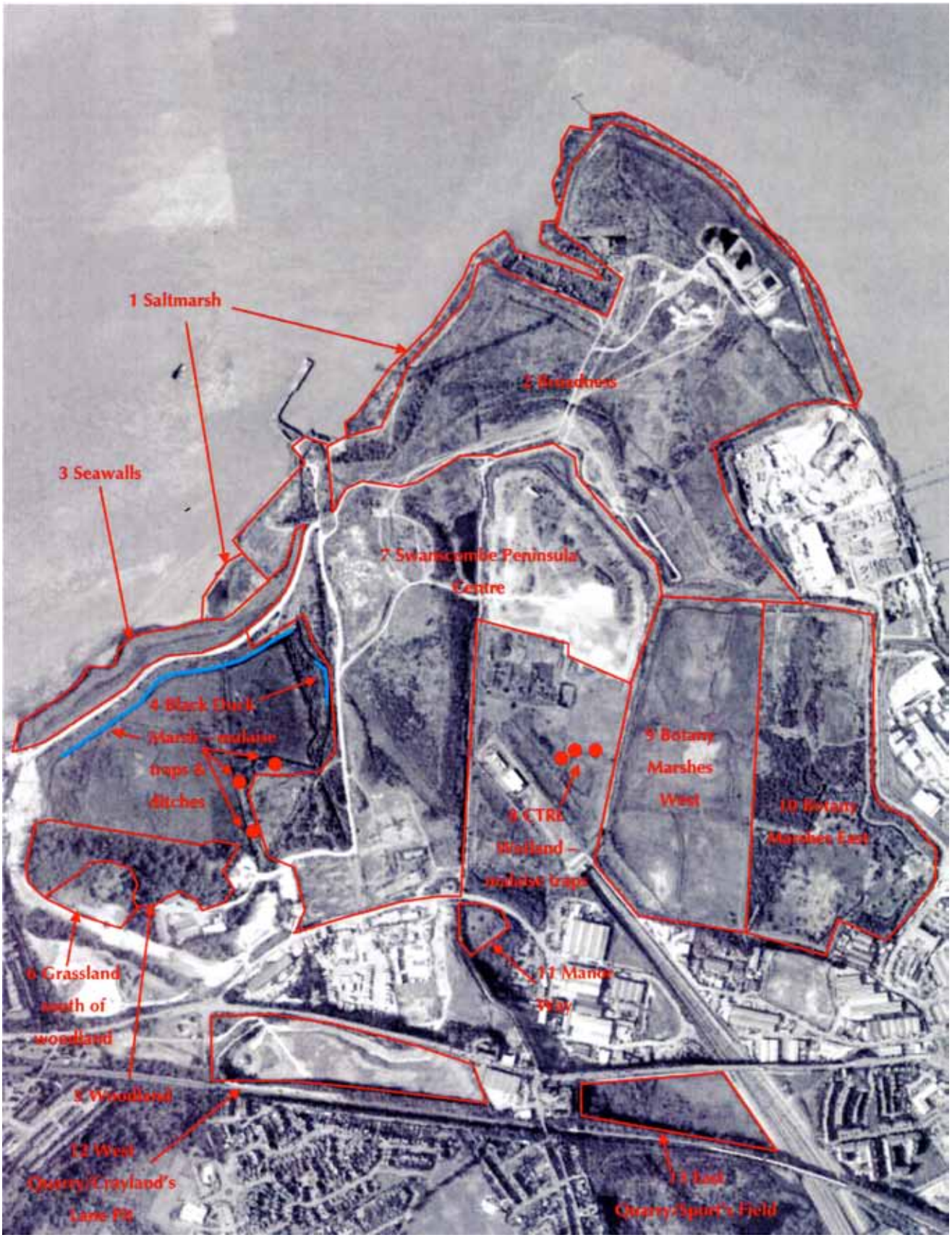
2.1.2 Field surveying during 2015 was complemented by two sets of Malaise traps and 9 runs of Pitfall traps. The locations of these are noted in the following discussion of individual areas.

2.1.3 The brief habitat sketches below include information on a selection of the insects associated with the areas. These are meant to serve as an indication of the conditions present, not an exhaustive list of species. For this see Appendix 1.

2.2 Please refer to Maps 1, 2, 3 throughout this discussion.

2.3 Saltmarsh (area 1).

2.3.1 This area was not re-surveyed in 2015 by M.E. and P. H.. It was re-surveyed by P.L and for the first time by G.C. and JK.. The brackish salt marsh, notably around the small creek, also had a number of specialist insects associated with it, despite its small area and the poor quality of parts of it,



Map 1. Survey areas 1 to 13.

probably due to seepage from the tipping. These included:

i) The Section 41 mining bee *Colletes halophilus* which collects its pollen exclusively from the flowers of Sea Aster *Aster tripolium* and is only found along the coasts of the English Channel in the whole world. This bee nests in small areas of dry bare ground close to its food plant.

ii) The large soldier fly *Stratiomys singularior* whose larva live in the wet mud and small pools of the saltmarsh and associated ditches.

iii) The small money-spider *Praestigia duffeyi* (Section 41), restricted in the UK to the salt marshes of the south-eastern seaboard and the larger wolf-spider *Arctosa fulvolineata*, also Section 41 and restricted to a similar geographic area.

2.4 Broadness (area 2).

2.4.1 This area was not re-surveyed in 2015 by M.E. and P. H.. It was re-surveyed by P.L by the eastern Pylon only and for the first time overall by G.C. and JK.. Small areas where soil had been moved about and/or where gentle disturbance due to walkers forming paths were of high significance for both aculeate Hymenoptera and phytophagous Coleoptera. This was due to both the creation of areas of bare and re-vegetating ground as a physical feature, and to the presence of a diverse flora associated with these areas.

2.4.2 During the 2012 survey the Section 41 jumping spider *Sitticus distinguenus* was caught in a pitfall trap close to the eastern Pylon, consequently further searches were made in this location during the 2015 survey. No further specimens of this spider were found in 2015.

2.4.3 The area generally had a high number of conservation-significant species present. These included :

i) The Section 41 bumblebee *Bombus humilis* which required large areas of flower-rich (especially legume-rich) habitat for foraging, with stands of open, medium height grassland for nesting purposes.

ii) The Section 41 potter wasp *Odynerus melanocephalus*, which preys on *Hypera* (Coleoptera: Cuculionidae) larvae associated with leguminous plants and requires areas of open, sun-warmed soil for nesting.

iii) The Section 41 ground beetle *Anisodactylus poeciloides* which is associated with coastal marshes in southern and south-eastern England.

iv) The Weevil *Coelositona cinerascens* (RDBK), thought to have become extinct, but with a few recent records. However, these may reflect a modern re-colonisation, rather than an undiscovered population.

v) The Tachinid fly *Cistogaster globosa,* RDB 1. This small fly, the larvae of which parasitise the Bishop's Mitre shield-bug is very restricted in distribution, requiring hot micro-climates and sparsely vegetated grasslands.

vi) The fly *Dorycera graminum,* Section 41 and RDB 1, which is associated with warm, open-structured grasslands. This fly has proved to be rather more widely distributed than previously thought and is particularly well represented in the dry grasslands associated with the Thames corridor.

2.4.4 The above selection of species illustrates the importance of this area and the diversity of habitats it contains.

2.5 The sea-walls (area 3).

2.5.1 This area was not re-surveyed in 2015 by M.E. P.L. and P. H.. It was surveyed in 2015 for the first time by G.C. and JK..

2.5.2 The old sea-wall had been left after the re-building of the new wall and a low-lying area of occasionally inundated grassland and incipient reed bed now lies between the two walls. Both this area and the grasslands of the re-profiled sea wall were being managed on a cyclical cutting basis. The outcome of this has been an overall good continuity of forage resources for associated insects and a varied plant community. Many of the insects associated with the grasslands on all the sample sites were recorded on these grasslands too.

2.5.3 As well as *Bombus humilis* being plentiful on the flowers of the widespread legumes of this area, it also produced a record of the RDB 2 Hoverfly *Lejops vittatus.* The larvae of this species develop in the damp soil and vegetable matter around stands of Sea Club-rush *Bulboschoenus* (*Scirpus*) *maritimus* and hence the fly is most likely associated with the ephemeral ditches between the two sea walls. This ephemeral habitat is also that associated with the Scarce Emerald Damselfly *Lestes dryas*, at the nearby Cliff Pools RSPB reserve, but the survey failed to record this species.

2.6 Black Duck Marsh (area 4).

2.6.1 Access to the centre of this area was not possible due to high water-levels in the surrounding ditches and dense stands of Common Reed making any progress through the marsh proper highly dangerous, due to hidden internal ditches. Survey was therefore limited to searches of the edges of the northern ditches (P.L, G.C. and J.K), set of pitfall traps along the northern ditch and a set of three malaise traps set along the outer margins of the surrounding ditches on the southern margin (Map 1).

2.6.2 The samples from these traps inevitably contained a mixture of species associated with the wetland and adjacent dry-land habitats. For the purposes of analysis and association with Black Duck Marsh, these were filtered for species with known dependencies on wet or humid habitats. All species recorded are listed under Area 4 Black Duck Marsh in the species tables (Appendix 1).

2.6.3 The damp woodland to the south which fringed the edge of the marsh was surveyed, with an emphasis on Craneflies (Diptera: Tipulidae). This area is accorded its own listing (area 5 below).

2.6.4 Significant species associated with this area include:

i) The water-beetle *Enochrus halophilus* (Nationally Scarce), associated with brackish ditches and very infrequently found, although widespread in coastal marshes..

ii) The predatory water-beetle *Rhanus frontalis* (Nationally Scarce) which lives in freshwater ditches.

iii) The rove beetle *Aleochara brevipennis* (Nationally Scarce). This beetle preys on fly larvae at the margins of ditches and ponds.

iv) The soldierflies *Odontomyia tigrina, Vanoyia tenuicornis* and *Oxycera morrisii* (all Nationally Scarce). The larvae of these flies live in the wet mud and moss at the sides of ditches and ponds. Interestingly the *Oxycera* is associated with calcareous situations and it is possible that the dumping of highly alkaline material here has increased the available habitat, which would have been formerly much more closely associated with the springs coming out of the chalk closer to Swanscombe itself.

v) The hoverfly *Parhelophilus consimilis* (RDB 2). The larvae of this fly live in decaying vegetable material at the edges of ditches and ponds.

2.7 Wet woodland to the south of Black Duck Marsh (area 5)

2.7.1 This is clearly a modern woodland, composed largely of Sycamore, often growing on piles of flints which were by-products of the Cement industry quarrying. The ground flora was predominately Ivy *Hedera helix*, but there were a few patches of other species, notably a large stand of Hemlock Water Dropwort *Oenanthe crocata*, which attracted a good range of insect species. Although this species is often found where woodland has overwhelmed previously open wetland habitat, it is not primarily a woodland one.

2.7.2 The major target group for this woodland were the Craneflies (Diptera: Tipulidae), because of the rather wet ground layer towards the junction with Black-Duck Marsh. Although there were indeed plentiful insects of this group present, especially in the May and June samples, just one was of any significance, *Limonia masoni* (RDB 3). This species is associated with calcareous seepages on the edges of woodland and, like the Stratiomyid fly *Oxycera morrisii,* the use of the area as a dumping ground for highly calcareous material may well have increased the available habitat.

2.7.3 A set of pitfall traps was used in this woodland.

2.7.4 This area also produced a record for the Nationally Scarce millipede, which is possibly an ancient introduction, *Stocatea italica*. This millipede is largely confined to Kent. It was also found in Bamber Pit.

2.8 Dry grassland south of Black Duck Marsh (area 6)

2.8.1 This area appeared to have a very similar history as much of the central area of the Peninsula, with a shallow soil over a pan of set concrete. Consequently the scrub element was in discrete patches, with little sign of expansion, apart from the brambles which were able to send long runners across the hostile areas of hard pan. It was a very hot area as soon as the sun came out.

2.8.2 Development works to the immediate south had produced a more recently disturbed soil, with a greater variety of plants. It would appear from the plentiful large butts piled in heaps that much of this newly disturbed area had previously been well-developed woodland with rather deeper soil.

2.8.3 Significant records include:

i) The Section 41 species *Bombus humilis* and *Dorycera graminum,* plus *Euplagia quadripuncta,* the Jersey Tiger-moth, all of these are species of dry grasslands.

ii) The moth *Bembecia ichneumoniformis* the 6-Belted Clearwing, (Nationally Scarce) a species of dry grasslands where the caterpillar lives in the roots of legumes. This moth was quite widespread over all the site.

iii) The Tachinid flies *Cistogaster globosa* and *Gymnosoma nitens* (both RDB 1). These flies parasitise shield bugs living in hot, dry grasslands and were found in several different sample areas.

iv) The mining bee *Lasioglossum pauperatum* (RDB 3), although it is quite frequent in the Thames corridor it is infrequently found outside this area.

Photo 1. Looking across typical grasslands of area 7 towards the eastern pylon in area 2

Photo 2. The large cement waste dump on the eastern boundary of area 7 was extensively disturbed during remedial action in 2014-15. This disturbed habitat was already being well colonised by dry-ground insects during the 2015 survey. A line of pitfall traps was placed across this area.

Photo 3. The area of grassland in the south-western section of area 7 which adjoined the boundary ditch of Black Duck Marsh. Three Malaise traps were set around the western and northern margins alongside the ditches and a set of pitfall traps ran across the grassland.

2.9 Swanscombe Peninsula centre (area 7)

2.9.1 A large area with three principal habitat components:

a) Dry skeletal grasslands, similar to those described in 2.8.

b) Recently disturbed, well-drained substrates, usually developed from dumped waste from the cement industry, which had a very open vegetation structure. The area around the old jetty was included here in this component.

c) Established, closed grasslands, but with a high level of leguminous plants present.

2.9.2 Small areas of scrub, often including Broom *Cytisus scoparius,* Hawthorn *Crataegus monogyna* and Bramble *Rubus* sp. were dotted about all components to a greater or lesser degree (Photo 1).

2.9.3 Pitfall traps were used across the old tipping site in the north-east of this area (Photo 2.). Another set was used in the grasslands in the south-western corner, against Black Duck Marsh, near the Malaise traps (Photo 3).

2.9.4 Most of the significant species associated with dry grasslands were present in this sample area, additions to those already listed in earlier sections include:

i) The jumping spider *Sibianor aurocinctus* (Nationally scarce), associated with dry, sparsely-vegetated grasslands.

ii) The ground Beetle *Panagaeus bipustulatus* (Nationally scarce), associated with hot, dry grasslands.

iii) The weevil *Hypera meles* (Nationally scarce). Both adult and larva fed on the flowers and seeds of a range of legumes.

iv) The conopid fly *Ziodon cinereum* (Nationally scarce). This fly lays its eggs in the abdomens of solitary bees, pouncing on the bee as it visits a flower. The larva develops inside the host, eventually killing it. A high bee population is needed to maintain the parasite.

v) The fly *Thereva plebeja* (Nationally scarce). The larvae of this fly live underground in dry soils, where they actively hunt other invertebrates.

vi) The picture-wing fly *Meliera picta* (Nationally scarce). The larvae probably live in stems of grasses. It is largely restricted to coastal grasslands in the Thames corridor.

vii) The mining bee *Andrena nigrospina*. This large, black mining bee has only just been convincingly shown (by new DNA analysis - using specimens found during the survey in part) to be a separate species to the almost identical *Andrena pillipes*, also present on site. In the re-classification of the conservation statuses of the aculeate Hymenoptera (G. Powney , M. Edwards, N. Isaacs in prep.) this species is likely to be rated as IUCN Vulnerable or Endangered. During the present survey this species was found to be exclusively collecting pollen from flowers of the Brassicaceae, most notably the introduced Hoary Mustard *Hirschfeldia incana*. This plant, and other Brassicaceae, is part of the very important 'occasional disturbance flora' of the area.

viii) During the 2012 survey an immature spider, thought to be most probably *Sitticus distinguenus,* was found by the old jetty. Despite further searches in 2015, no further confirmatory material was taken.

2.10 The CTRL wetlands (area 8)

2.10.1 These wetlands (Photo 4) were largely developed after the establishment of the CTRL tunnel entrance in the site. Prior to this event Bill Wadsworth informs me that the stream running out from the cliff was clear and full of aquatic vegetation. The tunnel, and possibly mitigation action for this, led to the development of bodies of open water adjacent to the northern edge of the tunnel. Those nearest the tunnel are fresh, becoming more brackish northward. These water bodies have a good aquatic flora, a very different state to those further north which have been heavily modified by the leachate from the tips and are almost devoid of aquatic vegetation.

Photo 4. Looking over the CTRL wetlands from the spoil heap in photo 2 towards the quarry edge by Manor Way. The Malaise and pitfall traps were set in the reed-bed of the middle ground.

2.10.2 The presence of reed is long-established over the entire area, so the development of a reed-dominated wetland is to be expected once any grazing pressure is removed through change of use. However, we were able to cut a track into the middle of the reedbed and establish a set of Malaise traps approaching the water bodies (Map 1). This run in was also used for a set of pitfall traps

2.10.3 The records from these Malaise traps and pitfall traps are presented as one sample. They included a surprising number of dry-land associated insect species despite being well into the reed-bed, an illustration of how insects will use different parts of the overall habitat for different purposes, many of the bees and wasps recorded could not have been maintaining soil-based nests here, for instance. For further analysis of wetland species the records were filtered for species with known dependencies on wet or humid habitats. All species recorded are listed under Area 8 CTRL wetlands in the species tables (Appendix 1).

2.10.4 All 3 of the Section 41 species recorded are dry-land species. However, the RDB species include three species closely associated with good-quality water-bodies:

i) The cranefly *Dicranomyia danica* (RDB 3). The larvae live in wet mud in mildly brackish conditions.

ii) The weevil *Bagous argillaceus* (RDB 2). This weevil is largely restricted to brackish marshes in the Thames corridor and probably feeds on grasses.

iii) The sphecid wasp *Passaloecus clypealis* (RDB 3). This small wasp is a true wetland specialist, using the old, dry stems of Common Reed for nesting in and provisioning these with aphids from the reed beds. It has never been found away from this association with Common Reed. It is largely an East Anglian species, with the Thames corridor the most southerly area known in the UK. However, it may well be more widely distributed within this area than known, due to the difficulty in surveying for it.

2.10.5 The Nationally scarce species also include a number of good-quality wetland species, these include:

i) The money-spider *Hypomma fulvum* (Nationally scarce) which has a very strong association with reedbeds.

ii) The ground beetles *Bembidion fumigatum* and *Pterosticus gracilis* (both Nationally scarce) are strongly associated with wetlands, the former species being largely restricted to eastern England.

iii) The Ladybird *Scymnus limbatus* (Nationally scarce) feeding on aphids on *Salix* species in wetlands.

iv) The weevil *Gymnetron villosulum* (Nationally scarce) which feeds on Water-speedwells *Veronica* species.

v) The hoverfly *Neoascia interrupta* (Nationally scarce). It is thought that the larvae develop in the leaf-litter associated with beds of Reed Mace *Typha* species.

2.10. 6 Of the three wetland areas surveyed during 2015, this area had by far the most important wetland fauna. Partly this may be due to the ability to deploy Malaise traps fully within the area, but the species recorded themselves also point to a relict fauna drawn from those which were present before the use of the area as a tip for cement waste, or the establishment of the tunnel entrance.

2.11 Botany marshes west (area 9)

2.11.1 This field is in active grazing management, it also has a few recently created scrapes aimed at wading birds. As the cattle were present, and there were potentially breeding lapwing on the field we were unable to enter for survey until 17/07/205.

2.11.2 This visit confirmed what scanning with binoculars had suggested: that there was little habitat of potential importance for invertebrates present. The ditches were by this point dry, as were the scrapes. There was low diversity of plant species, with consequent implications for phytophagous insects and the structural diversity in the vegetation was low (Photo 5).

2.11.3 After a two-hour sampling period we agreed that this site would not be visited again within the 2015 programme.

Photo 5. View across area 9, towards area 10. This was a remnant area of low quality grazing marsh.

2.12 Botany Marshes east (area 10)

2.12.1 This extensive wetland area is under active natural environment management by the owners, with a dedicated manager in place. It is not within the proposed development footprint. It was surveyed, with the owner's consent, to provide some comparison data for the sites within the footprint.

2.12.2 The two dominant habitat types are largely dry reedbed and occasionally inundated mature Hawthorn scrub. These have clearly arisen as the former grazed area has fallen out of agricultural use. There are a number of wet, and not so wet ditches throughout the site and a newly excavated larger area of water towards the eastern margin.

2.12.3 The extreme eastern margin is a dry bank of largely made-up material supporting the road. This bank and the occasionally mown edges of the adjacent wet ditch provided most of the records presented here. Whilst a circular walk round the site was undertaken on most visits, much of the Hawthorn scrub and dry reedbed was singularly uninteresting, the exception being the area of intermittently cut dry reedbed and grassland in the north-west corner.

2.12.4 No Malaise trap samples were taken here, but a line of pitfall traps were set in the north-western grassland.

2.12.5 The bumblebee *Bombus humilis* was found here, an illustration of the wide-ranging nature of these bees, which require areas in the range of $10Km^2$ to maintain populations. The mining bee *Andrena nigrospina* was also found here in the middle of the dry reedbed, but on a small stand of Hoary Mustard flowers in an area which had been disturbed during the creation of the site access path.

2.12.6 Other conservation significant species included:

i) The plant-hopper *Oliarus panzeri* (Nationally scarce). This insect feeds on the roots of plants in wetland. It was quite widespread in the overall survey area.

ii) The flea beetle *Longitarsus ballotae* (Nationally scarce), associated with Black Hoarhound, of which there were considerable stands along the eastern boundary.

iii) The hoverfly *Neoascia geniculata* (Nationally Scarce). It is thought that the larvae develop in the leaf-litter associated with beds of Sweet Grass *Glyceria* species, in wet places.

2.12.7 It is noticeable that the wetland component here is much less significant than that at the CTRL wetlands (2.10). It was very apparent that water-levels were not maintained over much of the season on most of the site, in comparison with the CTRL wetlands. Contamination of the water by effluent from the tips is not likely to be high.

2.13 Manor Way (area 11)

2.13.1 This small pit had been part filled with a very dry material, largely old road planings, which made a rather coarse substrate. It was, however sheltered and very warm even in generally cool conditions.

2.13.2 The ground flora was restricted, being dominated by Buddleia *Buddleja davidii*, Bramble and Ivy, but occasional patches of Lucerne *Medicago sativa* were very attractive to a range of insects when in flower. There were exposures of sandy material at the top of the quarry cliff. However, these largely faced North and were not likely to be as significant as those in other pits surveyed where they faced south.

2.13.3 The many old, hollow stems obviously provided ample nesting sites for our only carpenter bee, *Ceratina cyanea* (RDB 3), I don't think I have ever sen it as commonly as here. This species, which was distinctly rare and restricted, has undergone considerable expansion in the past 20 years and would not now merit its RDB 3 rating. However, it remains dependent upon warm sheltered sites in order to get its two generations a year completed.

2.13.4 Other conservation significant species recorded here include:

i) The harvestman *Trachyzelotes pedestris* (Nationally scarce), typical of hot, dry, well-drained sites.

ii) The ground beetle *Brachinus crepitans* (Nationally Scarce). This beetle is strongly associated with shingle and other stony areas, the filling with road-planings obviously suited it here.

2.14 Craylands Lane pit (area 12)

2.14.1 This large pit (and Bamber Pit (12.16)) were the most diverse of all the pits recorded in this survey. It had clearly been part-filled with calcareous material - possibly from the CTRL tunnel excavation - and this had been sown with a varied mix, including a good representation of chalk

grassland species. This grassland had also been re-disturbed after the original filling and was open-structured and warm (Photo 6).

2.14.2 Added to this was a substantial band of sands running above the chalk, with a long south-facing section. The extensive development of Budleia and Italian Alder *Alnus cordata* (an all-too frequent component of many pit restoration schemes) along this southern edge had recently been cut back severely, exposing the slopes to the warmth of the sun once again.

2.14.3 Although little of the above management had been done with environmental enhancement in mind (after the original sowing) the current situation serves as an excellent example of the sort of ongoing management required to keep the conservation interest of the area present.

Photo 6. Looking across area 12, the older and more recently disturbed grasslands can be sen in the foreground. The band of Thanet Sands on top of the chalk show up well. A line of pitfall traps ran across this area.

2.14.4 A line of pitfall traps was set out over the flat central grassland area.

2.14.5 Conservation significant species recorded here included:

i) The earwig *Apterygidia media* (Nationally scarce).This warmth-loving earwig is extremely restricted in range to the south-eastern part of England.

ii) The bug *Bathysolen nubius* (Nationally scarce) which is associated with Medicks *Medicago* species growing on re-vegetating ground.

iii) The Chalk Carpet moth *Scotopteryx bipunctaria* (Section 41). The caterpillar of this moth feeds on a range of leguminous plants growing in warm situations.

iv) The weevil *Hypera fuscocinerea* (Nationally scarce), which feeds on Medicks *Medicago* species growing in dry, re vegetating areas.

v) The sphecid wasp *Cerceris quinquefasciata* (Section 41). This wasp preys on weevils living on herbaceous plants and nests in warm sandy areas.

vi) The pompilid wasp *Aporus unicolor* (Nationally scarce). This spider-hunting wasp is a specialist predator of the trap-door spider *Atypus affinis*, which lives in warm, dry grasslands. Despite finding several individuals of the wasp, searches of the slope towards the old tunnel entrance at the western end of the pit failed to find the host spider - it must be present however!

2.15 Sports Field pit (area 13)

2.15.1 Access to this pit was not possible until quite late on (July) and only 3 visits were made. Geographically it is essentially an extension to Craylands Pit and has the same south-facing exposure of sandy material at the top of the quarry cliff. The floor of the quarry, however, has a much ranker grassland, with Wild Parsnip *Pastinaca sativa* and Stinging Nettle *Urtica dioica* frequent and an extensive dense cover of brambles at the western end. The previous use as a sports field has obviously left its mark, but we suspect that rather more nutrient-rich material has been dumped here in the past too. The flora closer to the cliff was generally more diverse and less nutrient-dependent (Photo 7).

2.15.2 A set of pitfall traps were placed in this more diverse grassland, once access had been granted.

Photo 7. The ranker grassland in area 13 is clearly seen, as is the important band of sand above the chalk.

2.15.3 Despite this much less favourable environment several of the important species from Craylands Pit were present here too. As well as *Bombus humilis* and *Cerceris quinquefasciata* these included:

i) The ladybird beetle *Platynaspis luteorubra* (Nationally scarce) which is a predator of subterranean aphids. The beetle has a close relationship with ant nests.

ii) The bee *Hylaeus signatus* (Nationally scarce), associated with the flowers of *Reseda* species, plants which rely on intermittent disturbance to establish from seed.

2.16 Bamber Pit (area 14)

2.16.1 Lying directly to the south of Sportsfield Pit with just the railway line between them it would be expected that this area would have a very similar fauna to both Sports Field and Craylands pit, and this was indeed so. The band of sandy material at the top of the cliff was generally obscured by subsequent piling of other, largely sandy, landfill against this face and this was extensively covered by dense stands of Hemlock *Conium maculatum* and Brambles (Photo 8).

2.16.2 The north-facing side had similarly had fill piled up against it, but this was of a more chalky nature and supported a more diverse flora, including many legumes. Dense stands of Bramble and Hawthorn were, however present as well.

Map 2. Survey areas 14 to 19.

Photo 8. Spoil had been piled up against the sides of area 14. On the south-facing side this had become heavily grown over with rank vegetation. Considerable areas of the floor were, however, quite open, with skeletal soils often present.

2.16.3 A set of pitfall traps was set in the floor of the pit.

2.16.4 The floor of the pit had both sandy and chalky areas and much of this was fairly open, with parts clearly drought-stresses and having large stands of Viper's Bugloss *Echium vulgare*. Despite searches, neither of the two beetles which specialise on this plant were found. However the only record of the bee *Anthophora quadrimaculata* (Nationally scarce) during the entire survey was from its flowers here.

2.16.5 As in many other places both *Bombus humilis* and *Dorycera graminum* were present, among conservation significant species which were not found in both the Sports Field and Craylands Pits were:

i) The Harvestman *Trachyzelotes pedestris* (Nationally scarce) associated with both sandy and calcareous grasslands.

ii) The ground beetle *Ophonus azureus* (Nationally scarce). This beetle is associated with bare ground on calcareous soils.

iii) The leaf-rolling moth *Pammene agnotana* (RDB 1). The larva lives under the bark of old Hawthorns.

iv) The sphecid wasp *Pemphredon rugifera* (RDB 3). This group of wasps prey on aphids and nest in beetle galleries in old wood. It is infrequently found, but widely distributed in the UK.

v) The cuckoo bee *Sphecodes longulus* (Nationally scarce). This bee is a cleptoparasite of the very small mining bee *Lasioglossum minutissimum*, itself not frequently found. There was a good colony of both the *Lasioglossum* and the *Sphecodes* at the south-western corner of the pit.

2.17 Northfleet Landfill (area 15)

2.17.1 Undoubtedly the main feature of importance here were the exposures of Thanet Sands which had been retained as Geological SSSI when the pit was land-filled (Photo 9). These had extensive south-facing sides and had, in part, been recently exposed by removal of the surrounding bramble and Hawthorn scrub, making ideal nesting sites for a large range of bees and wasps. The landfill itself was rather species-poor, except in the eastern section where the flora was more legume-rich. Unfortunately the entire landfill is cut over in July to control the risk from fire (it is still being de-gassed). This makes the habitat for later-flying insects rather less valuable than it might otherwise be.

Photo 9. The exposures of Thanet Sands on the Geological SSSI were extremely important nesting sites for a wide range of solitary bees and wasps. The entrance holes can be clearly seen in this photo.

2.17.2 A good range of conservation significant species was recorded, including the three Section 41 species noted on many other parts of the survey: *Bombus humilis, Odynerus melanocephalus* and *Cerceris quinquefasciata.*

2.17.3 Other conservation-significant species recorded included:

i) The Earwig *Forficula lesnei* (Nationally scarce), associated with scrub and taller grasslands in the south-east of England.

ii) The bug *Lygus pratensis* (RDB 3). There has been considerable taxonomic confusion around this species in the past. It is associated with a range of habitats and is probably most affected by warmth. It has been increasing recently and was recorded on many of the sites in the survey.

iii) The hoverfly *Cheilosia cyanocephala* (Nationally scarce). The larvae of this fly bore into the roots of thistles in warm environments.

iv) The hoverfly *Chrysotoxum elegans* (RDB 3). This hoverfly is associated with ant nests, where the larvae prey on aphids within the nest.

v) The hoverfly *Pipizella maculipennis* (RDB 3). The larvae of this hoverfly feed on aphids on the roots of plants growing in well-drained, warm grasslands.

2.18 A226 Triangle (area 16)

2.18.1 This rather nondescript little area between the A226, the CTRL railway station and the local South-eastern railway line with a cycle-path, a pylon and a lot of semi-failed landscape planting of shrubs, produced a surprisingly large list of species, including some conservation-significant ones. Most of these were found in many of the other survey sites, underlining the landscape-level nature of the faunal assemblage as much as anything. However, one bee, the small *Hylaeus pictipes* (Nationally scarce), which nests in old beetle burrows in dead wood, was only recorded from this area.

2.19 CTRL Staff Car Park (area 17)

2.19.1 Initially selected during a winter visit as being of potential interest for a fauna associated with short, droughted grassland, it soon became apparent that the short nature of the sward was an outcome of incredibly frequent cutting, not drought-stress/poor nutrient levels. One weevil typical of this short grassland was recorded here, *Orthochaetes setiger* (Nationally scarce). This beetle has larvae which mine the leaves of a variety of plants and was also found in several other areas.

2.19.2 A bund between the car park and the railway line itself, which had rather longer, infrequently cut grass and together with shrubs produced rather more records but the site does not score well relatively at all.

2.20 CTRL east of main car parks (site 18)

2.20.1 This large area divided into three main habitats:

i) The large bund providing screening from the railway line itself. The area was flower-rich in the first part of the year, but was cut towards the end of June, so took some time to re-establish the flowers. However, this cutting regime, carried out on a steep slope so that the cuttings tended to fall to the bottom of the slope and did not form a mulch, was probably responsible for the maintenance of the early-year floral resource, especially large stands of Ox-eye Daisy *Leucanthemum vulgare*. This was a very good area for the early part of the survey, both because of the plentiful flowers and the relative shelter giving a warm microclimate.

ii) The seasonally inundated grassland immediately to the south of this bund, going half-way toward the minor road into Swanscombe. The seasonal wetness provided ideal conditions for the growth of large areas of Narrow-leaved Bird's foot Trefoil *Lotus tenuis,* well frequented by queens and workers of *Bombus humilis*, although there were other legumes present as well. At the southern boundary of this section, especially where it abutted the edge of the car park, had a small line of active seepages, supporting a more wetland flora and fauna. On the western side of this area is a bund of recently dumped soil, with large stands of Hoary Mustard present.

iii) The southernmost section was clearly over-topped by another layer of dumped soil, of a different, but unquantified, nature to the lower area. This supported a different flora, one which did not support as wide a variety of insect species despite the presence of abundant flowers, especially later in the year.

2.20.2 The area as a whole supported a good range of species including:

i) The spider *Clubiona juvensis* (RDB 2) associated with the reedbed of the seepages.

ii) The stilt-bug *Berytinus hirticornis* (Nationally scarce). This bug is associated with dry, sparsely-vegetated areas.

iii) The buprestid beetle *Trachys scrobiulatus* (Nationally scarce). This beetle mines the leaves of the widespread plant Ground Ivy *Glechoma hederacea* and is very difficult to find without the use of a suction sampler.

iv) The weevil *Zacladus exiguus* (Nationally scarce) which fees on the leaves of Cranesbills *Geranium* species.

v) The hoverfly *Pipizella virens* (Nationally scarce), the larvae of this fly are thought to feed on aphids on the roots of Apiaceae.

vi) The mining bee *Andrena niveata* (RDB 2). This species only collects its pollen from the flowers of Brassicaceae and, like *Andrena nigrospina*, is completely dependent on the soil conditions in which good populations of Brassicaceae can grow - this means occasional ground disturbance.

2.21 North of Springhead Nurseries (area 19)

2.21.1 This area has been largely dumped on with sandy material, possibly overburden from quarrying activity. The small valley on the southern edge beside the new roundabout on the A2260 is a remnant of its previous self, which is also just visible beside the stream in the north. The few large oaks present here suggest the area might well have been more wooded in the past, having potential affinities with the entomologically well-known Darenth Wood area further west.

2.21.2 The woodland fringing the stream is, with a few exceptional large oaks, largely a result of planting for screening. There is evidence of built-up land right in under much of this area. There is a concrete pipeline -probably a sewer - running along the edge of the stream for some way and the flora here is dominated by stinging nettles. Despite several forays into this wet margin no significant wetland insects were recorded here.

2.21.2 A set of pitfall traps ran from the woodland by the stream out into the dry grassland towards the south.

2.21.3 In contrast to the wet woodland, the dry grassland had considerable interest, many of the species recorded were found elsewhere during the survey, although there were a few more typical of older woodland towards the southern edge. These included:

i) The buprestid beetle *Agrillus laticornis* (Nationally scarce). The larvae live in oak twigs.

ii) The weevil *Polydrusus formosus* (Nationally scarce). This weevil feeds on the leaves of broadleaved trees

iii) The weevil *Lasiorhynchites olivaceus* (Nationally scarce). The larvae of this weevil bore into young twigs of Oak *Quercus* species.

iv) The snail-shell nesting bee *Osmia bicolor* (Nationally scarce) was only recorded at this sample.

v) The mining bee *Lasioglossum xanthopus* (Nationally scarce) was recorded here, among many of the samples during the survey.

2.22 The A2 corridor (area 20)

2.22.1 Access for this part of the survey was not obtained until July. The presence of a cycle path running westward from the interchange roundabout to the A296 slip road provided an opportunity to have an exploratory visit.. The dominance of the heavy passing traffic was absolute, with constant slip-stream winds present. Although a range of insects typical of the rest of the survey were recorded on this first visit, nothing suggested that the area would be anything other than a poor version of 'more of the same', so the decision not to make subsequent visits was made, the effort being better spent in other parts of the overall area.

3. INTERPRETATION OF THE SURVEY

3.1 A total of 1,992 species was recorded over the 2012 and 2015 surveys. In the following analysis the older system of Conservation statuses has been used. This is because:

a) Not all groups have new, IUCN-based threat-based assessments, most notably the aculeate Hymenoptera (ants, bees and wasps) which are an important part of the fauna of the site.

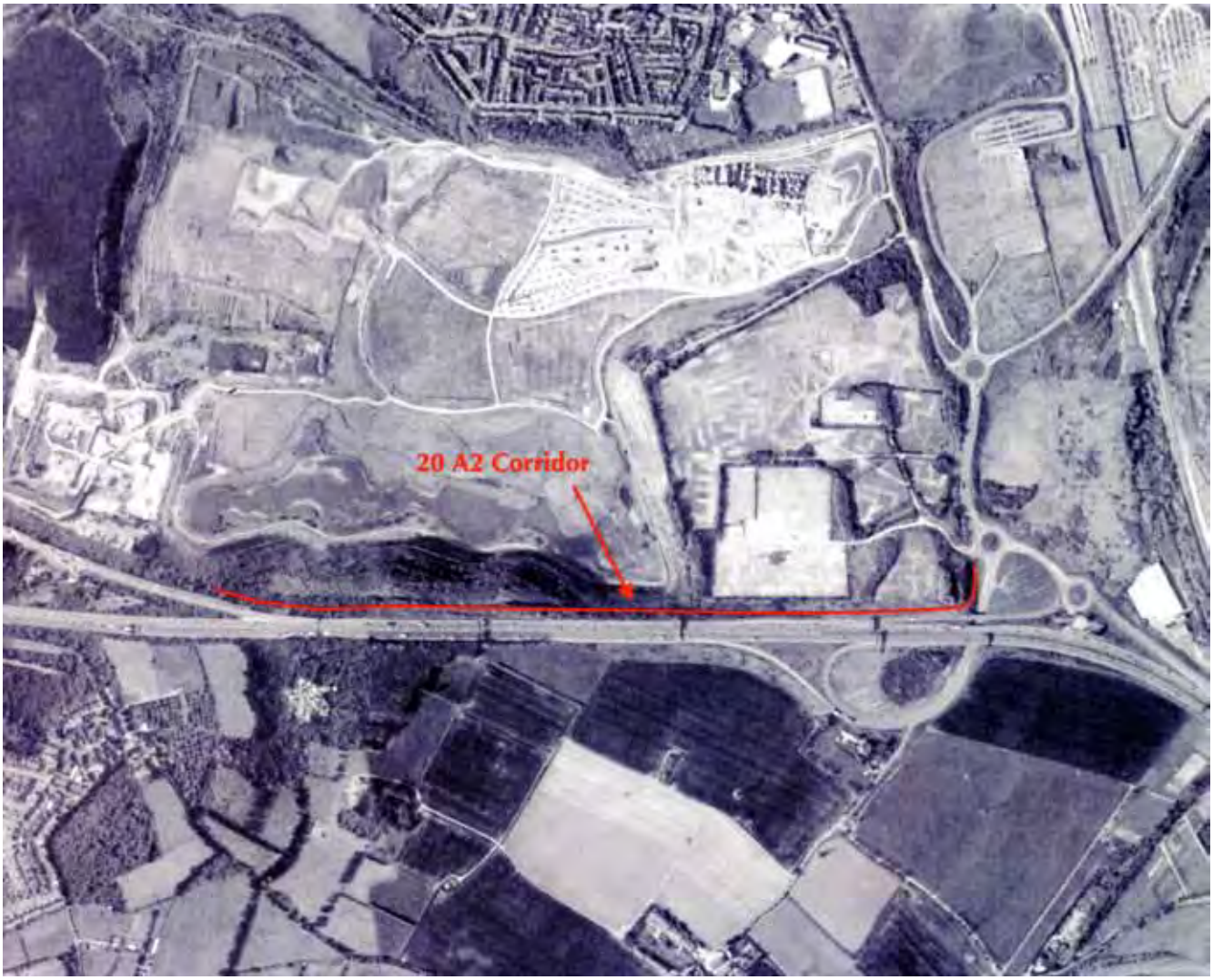
b) Comparisons with other sites in the Thames Corridor are made. These were all graded under the old system.

3.2 These grades are :

RDB 1. Endangered. Species currently (post 1970) known to exist in five or fewer ten-kilometre squares.

RDB 2. Vulnerable. Species in severely declining or vulnerable habitats, or of low known populations. Known to exist (post 1970) in ten, or fewer, ten-kilometre squares.

RDB 3. Rare. Species with small populations, not at present Endangered or Vulnerable, but which are felt to be at risk. Species currently known to exist (post 1970) in fifteen, or fewer, ten-kilometre squares.



Map 3. Survey area 20.

RDB K. Species of undoubted RDB rank, but with insufficient information for accurate placement; includes possible recent arrivals.

Nationally Scarce. Species currently (post 1970) known to exist in one hundred, or fewer, ten-kilometre squares.

To this list should be added the **Section 41** species, a more modern category listing species previously considered as Biodiversity Action Plan species (BAP). These species have been drawn from the wider pool. They are considered to be species which have declined, or under serious threat of decline, in the recent past. They may or may not have been listed under the earlier system.

3.3 With any system based on numbers of grid squares from which a species is known there is an inevitable increase in the number of known squares relating to any increase in:

a) The time period during which records are accumulated.

b) The amount of recorder effort and popularity of the organism in question.

There is no accepted way of modifying the system for these effects and statuses are taken as being a snapshot of the situation at the time the statuses were set.

3.4 There will also be changes due to habitat and climatic conditions, some species which were genuinely scarce when the lists were made have become far more widespread and commonly found. This report provides 'adjusted' statuses for a number of such species where such a situation is known to me and where these were recorded at Swanscombe LPER (Table 1). There will be additional species where I do not currently have such information. Totals using the raw and adjusted statuses are both given.

Order	Family	Species	Previous status	Adjusted status
HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	Gonocerus acuteangulatus	RDB 1	Nationally Scarce
DIPTERA (Flies)	Tachinidae (Parasite Flies)	Gymnosoma rotundatum	RDB 3	Nationally Scarce
DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	Myopites inulaedyssentericae	RDB 3	Nationally Scarce
DIPTERA (Flies)	Ulidiidae	Dorycera graminum	RDB 3. A UK BAP species	Nationally Scarce
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	Nomada hirtipes	RDB 3	Nationally Scarce
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	Gorytes laticinctus	RDB 3	Nationally Scarce
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	Myrmica specioides	RDB 3	Nationally Scarce
ARANEAE (Spiders)	Araneidae	Argiope bruennichi	Nationally Scarce a	None
ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	Pardosa agrestis	Nationally Scarce b	None
ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	Sympetrum sanguineum	Nationally Scarce b	None
ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	Conocephalus fuscus	Nationally Scarce a	None
ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	Metrioptera roeselii	Nationally Scarce b	None
COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	Demetrias imperialis	Nationally Scarce b	None
COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	Agapanthia villosoviridescens	Nationally Scarce b	None
COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	Phytoecia cylindrica	Nationally Scarce b	None
COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	Longitarsus parvulus	Nationally Scarce a	None
COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	Hippodamia variegata	Nationally Scarce b	None
COLEOPTERA (Beetles)	Curculionidae (Weevils)	Pselactus spadix	Nationally Scarce b	None
COLEOPTERA (Beetles)	Elateridae (Click Beetles)	Athous campyloides	Nationally Scarce b	None
DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	Merzomyia westermanni	Nationally scarce	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	Andrena florea	RDB 3	None

ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	Bombus rupestris	Nationally Scarce b	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	Ceratina cyanea	RDB 3.	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	Nomada fucata	Nationally Scarce a	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	Hylaeus cornutus	Nationally Scarce a	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	Hylaeus signatus	Nationally Scarce b	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	Crossocerus distinguendus	RDB 3	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	Mimumesa unicolor	Nationally Scarce a	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	Lasius brunneus	Nationally Scarce b	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	Lasioglossum malachurum	Nationally Scarce a	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	Lasioglossum pauxillum	Nationally Scarce a	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	Sphecodes crassus	Nationally Scarce b	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	Sphecodes niger	RDB 3	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	Auplopus carbonarius	Nationally Scarce b	None
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	Dolichovespula saxonica	RDB K	None

Table 1. The 'adjusted' statuses used in the analysis.

3.5 The IUCN system (summarised at the bottom of Appendix 2) seeks to address these issues, but also asks that statuses reflect the degree of threat to the species continued survival in a large geographic area. How this should be done for all insect groups is not yet fully resolved.

3.6 Appendix 1 provides a full listing of all 1992 species recorded during the survey, together with notes for each. Totals of 50 RDB and 203 Nationally scarce species (unadjusted) with 16 Section 41 species were recorded over the entire 2012 and 2015 survey. The adjusted totals were 38 RDB and 187 Nationally scarce species.

3.7 Full tables sorting the species by various categories are provided in Appendix 2

i) Table 1 provides of numbers of RDB and Nationally scarce species, by area using original statuses.

ii) Table 2 provides of numbers of RDB and Nationally scarce species, by area using adjusted statuses.

iii) Table 3 provides of numbers of RDB and Nationally scarce species associated with wet or humid habitats for area 4, Black Duck Marsh and area 8, CTRL wetland, using original statuses.

iv) Table 4 provides of numbers of RDB and Nationally scarce species associated with wet or humid habitats for area 4 Black Duck Marsh and area 8 CTRL wetland, using adjusted statuses.

v) Table 5 provides comparisons of numbers of species unique to the 10 areas with the highest numbers of species recorded, using original statuses.. This is graphed in figure 1.

vi) Table 6 provides comparisons of numbers of species unique to the 10 areas with the highest numbers of species recorded, using adjusted statuses. This is graphed in figure 2.

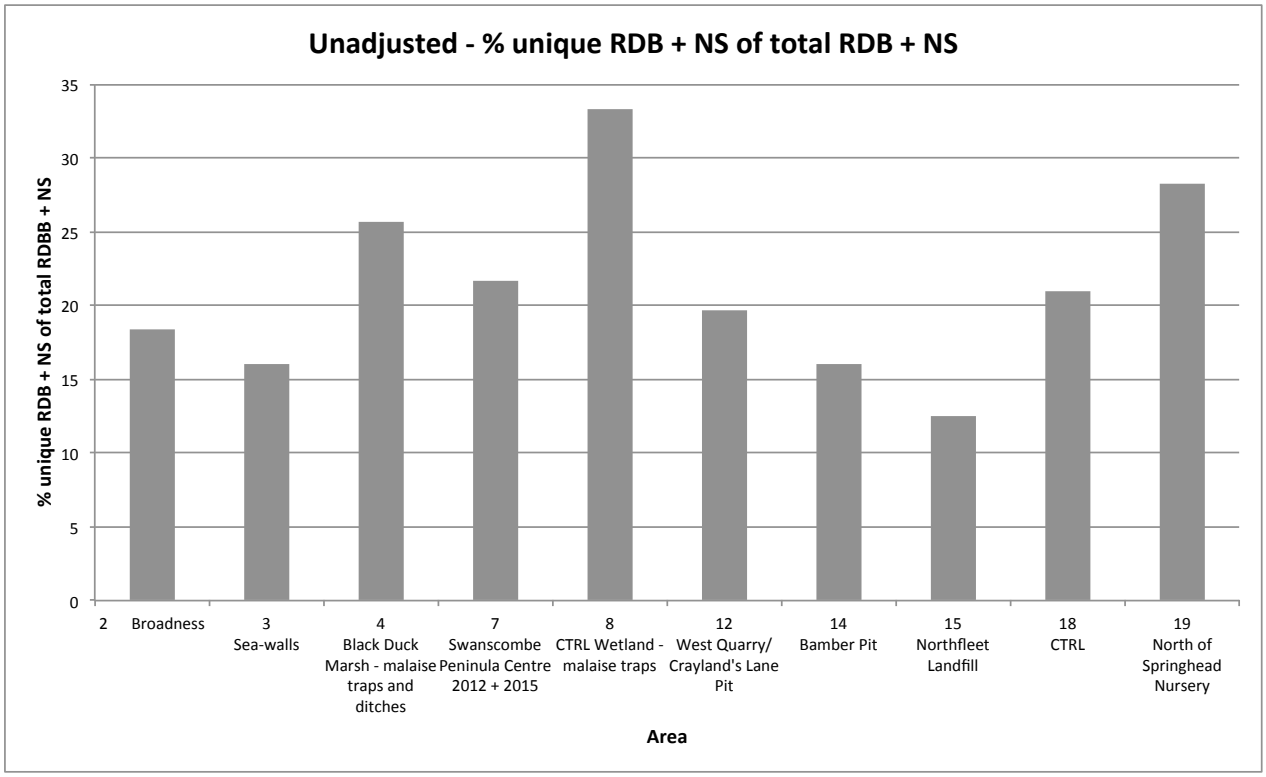


Figure 1. Comparison of number of RDB and Nationally Scarce species (original) unique to an area for the ten sites with the highest species totals.

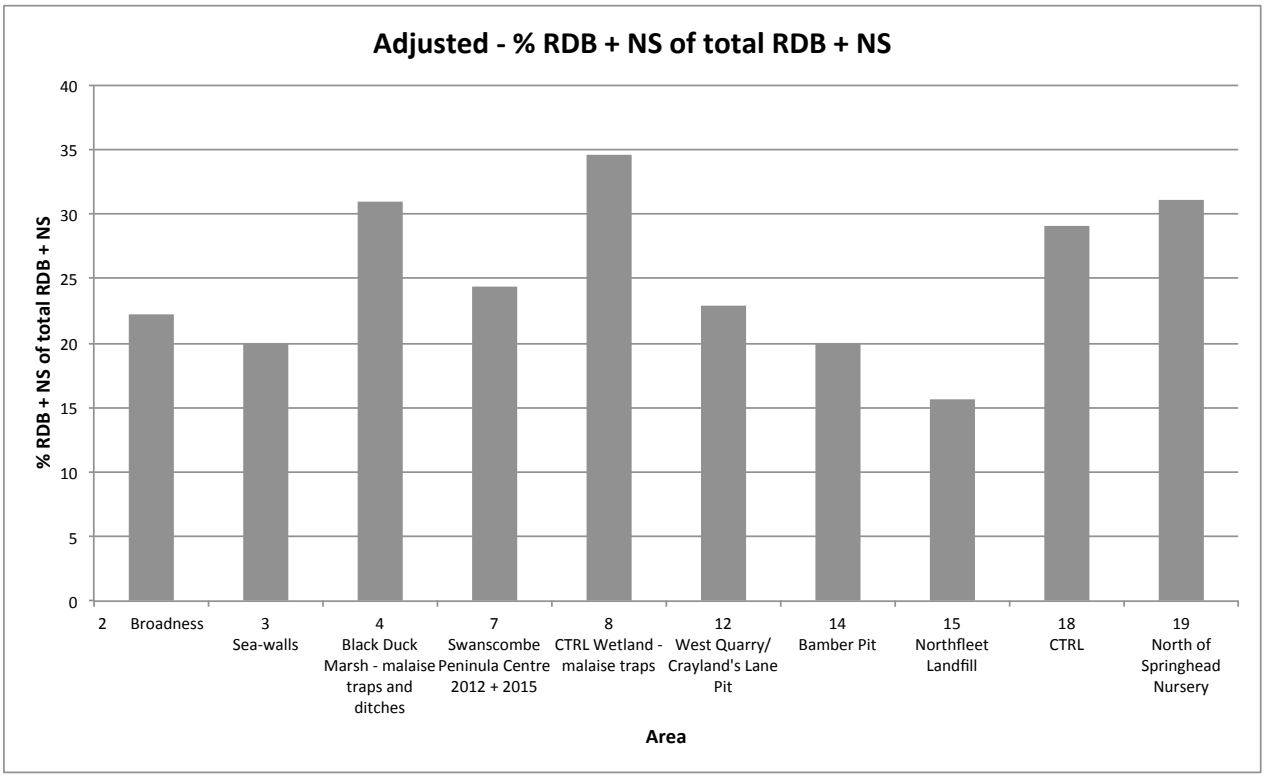


Figure 2. Comparison of number of RDB and Nationally Scarce species (adjusted) unique to an area for the ten sites with the highest species totals.

3.8 These two figures emphasis the high value of area 8, CTRL wetlands, largely for wetland species. Area 4, Black Duck Marsh, does not separate the considerable numbers of dry-land and wetland associated species, so reflects both components. Area 10, North of Springhead Nursery, reflects the greater representation of a woodland-associated component in this area.

3.9 Comparisons of numbers of RDB and Nationally scarce species (original) against area were made for 14 sites within the Thames Gateway area, using publicly available information (Appendix 3). These were: Canvey Wick; Paramount (this survey); Hadleigh Olympic bike course; Hadleigh bike course after completion of Olympics; West Thurrock; Chafford Hundred; Untidy Industries, Basildon. On all categories Paramount is shown to be extremely important for invertebrates. These are shown graphically in figures 3-5 below.

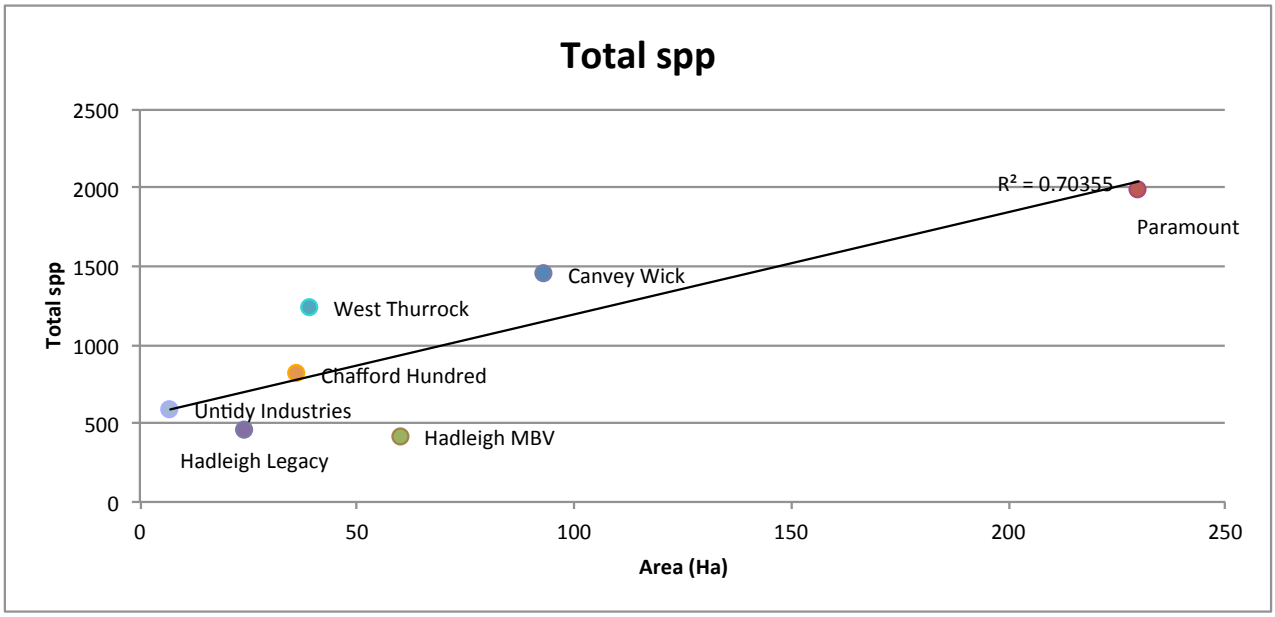


Figure 3. Comparisons of total species recorded against area by surveys in sites in Thames Gateway

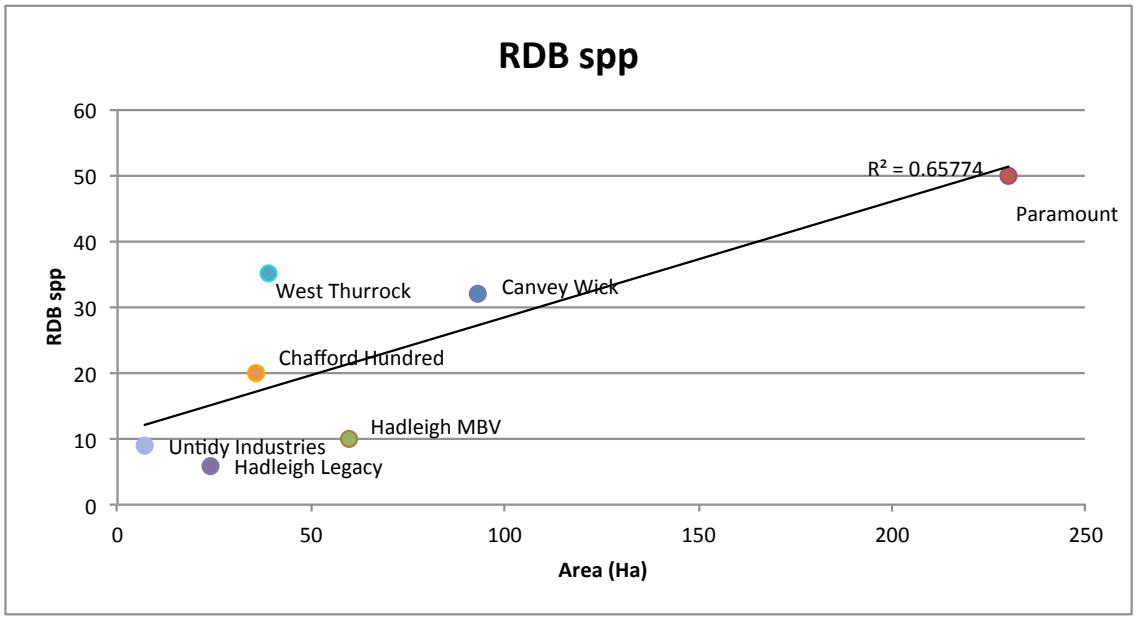


Figure 4. Comparisons of total RDB species against area recorded by surveys in sites in Thames Gateway

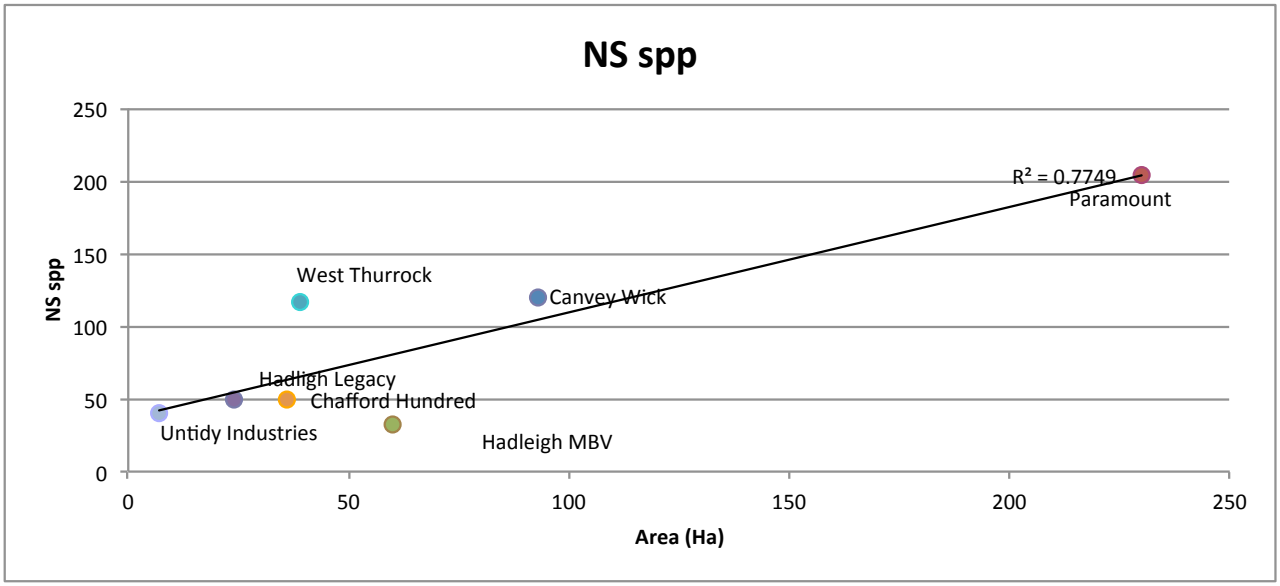


Figure 5. Comparisons of total Nationally scarce species against area recorded by surveys in sites in Thames Gateway

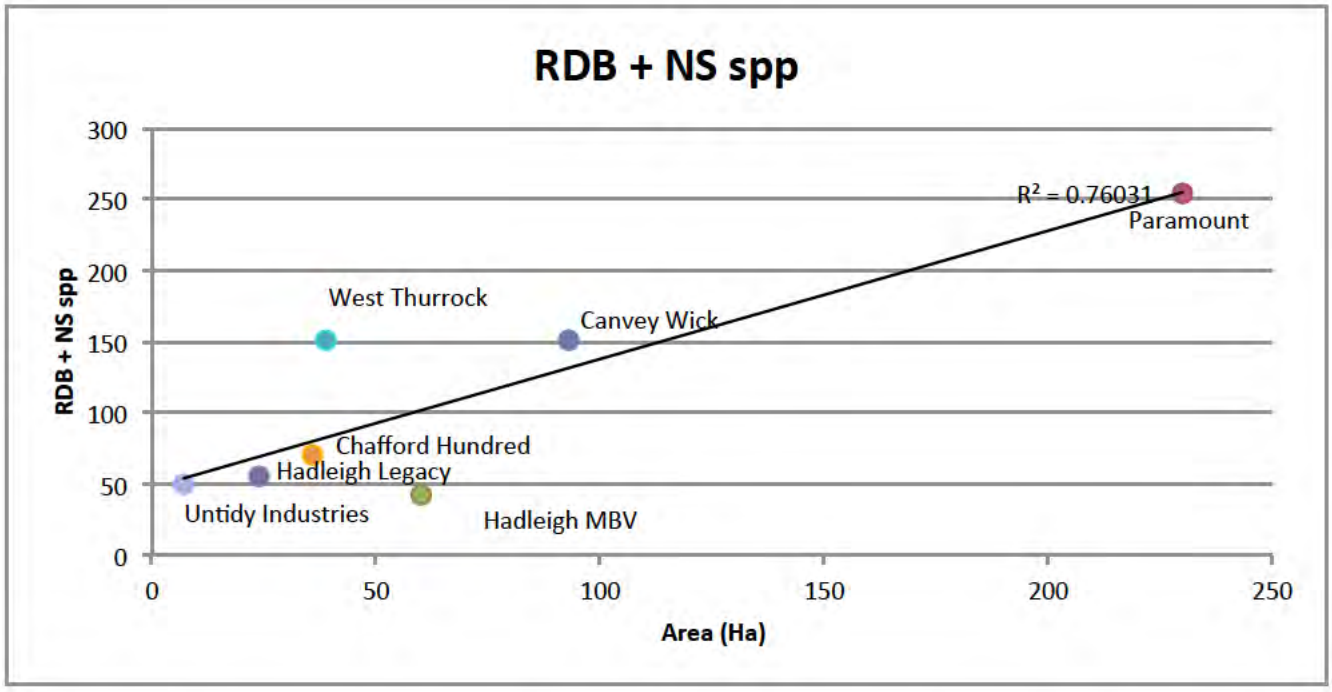


Figure 6. Comparisons of total RDB and Nationally scarce species against area recorded by surveys in sites in Thames Gateway

3.10 Comparisons were also made between the Kent and Essex County conservation-significant species known from within the 2km boundary and the species recorded during the LPER 2012 and 2015 surveys. The local lists were provided by Kent and Medway Biological Records Centre (for Kent bank of Thames) and Essex Field Club (for Essex bank of Thames). These comparisons are shown in figure 7.

3.11 The total lists provided included a number of species which were outside the survey brief of the current survey. These were predominately because:

i) No macro-moth light trapping survey was undertaken, although some recording from larvae was made.

ii) The range of Diptera groups was much wider for the Essex lists than for the current survey.

iii) Some species on the Kent list had not been recorded for a very long while.

iv) Some species on the Kent list are old woodland ones, a habitat not represented during the current survey.

3.12 These species are shown as 'Not likely to have been recorded during the LPER survey' in figure 7.

3.13 Appendices 4 and 5 provide the raw data for this comparison. Where I have additional data for the county species this is included. There are considerable sections of missing supplementary data for the Essex list (see 3.11), consequently this list is ordered alphabetically by species. For the Kent list I have complete supplementary data and these are ordered alphabetically by taxonomy.

3.12 For both the Essex and Kent 2Km lists, just over half the likely conservation significant species listed for the 2km boundary in each county were recorded during the current survey. Bearing in mind that these local lists represent data amalgamated over a considerable amount of time and considerably more recorder effort than the LPER surveys, the figure of approximately 50% indicates a very good level of coverage for the survey. It further highlights the high importance of the survey area both nationally and locally.

Location	Total species	Not considered likey to have been recorded during the LPER survey	Recorded during the LPER survey 2012 and 2015	Not recorded during the LPER survey 2012 and 2015
Swanscombe LPER	1992			
Kent list	225	-24 Old woodland species - Darenth area -3 Not recorded recently	107	118 - 27 = 91
Essex list	935	-232 Not in target groups	251	684 - 232 = 452

Figure 7. Comparison of species recorded at Swanscombe 2012 and 2015 with supplied lists of County conservation rated species for Kent and Essex within 2km boundary of site.

APPENDIX 1

Total Species List

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion ater*			Universal	Commonly found. Found in the ground layer of almost all habitats.	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion circumscriptus*			Universal	Commonly found. Found in moist sheltered sites. Typical of lowland woodland.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion flagellus*			Universal	Locally frequently found. In disturbed, sheltered sites in bothe synanthropic and semi-natural habitats.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion hortensis*			Universal	Frequently found. Local with few sites in norternBritain where it is restricted to synanthropic sites. In woodland and other semi natural sites in the south. Prefers well drained, base rich soils.	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion rufus*			Universal	Commonly found. Often recorded as Arion ater agg. Found in the ground layer of almost all habitats.	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Arionidae	*Arion subfuscus*			Universal	Commonly found. Found in the ground layer of almost all habitats. Very tolerant of acidic soils.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Assimineidae	*Assiminea grayana*			Southern Restricted	Commonly found. Restricted to saltmarshes on east coast from Humber to Thames estuary.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Clausiliidae	*Clausilia bidentata*			Universal	Commonly found. In woods, hedgerows and rocky places. Often in ground layer but readily climbs. Prefers base rich soils.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Cochlicopidae	*Cochlicopa c.f. lubrica*			Universal	Commonly found. In ground litter of humid, sheltered habitats.	0	0	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0

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000 MOLLUSCA (Slugs and Snails)	Cochlicopidaea	*Cochlicopa c.f. lubricella*			Universal	Frequently found. In ground litter of drier habitats than Cochilcopa c.f. lubrica including grasslands, dunes and quarries.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Endodontidae	*Discus rotundatus*			Universal	Commonly found. In a variety of habitats.	0	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Enoidea	*Merdigera obscura*			Universal	Commonly found. Found in ground layer of woodlands and other undisturbed, shaded habitats on base rich soils.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Helicidae	*Arianta arbustorum*			Universal	Commonly found. Found in ground and field layers of humid, shaded habitats including woodland and tall fen.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Helicidae	*Cepaea hortensis*			Universal	Very commonly found. In ground and field layer of a range of habitats. Often in moister, shadier habitats than Cepaea nemoralis.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Helicidae	*Cepaea nemoralis*			Universal	Very commonly found. In wide range of habitats.	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0
000 MOLLUSCA (Slugs and Snails)	Helicidae	*Cornu aspersum*			Universal	Commonly found. Increasingly lowland and coastal towards the north. Found in woodland in the south but mainly synanthropic. Prefers base rich soils.	0	0	0	0	1	0	1	1	0	1	1	1	1	1	1	0	0	1	1	0
000 MOLLUSCA (Slugs and Snails)	Helicidae	*Monacha cantiana*			Universal	Commonly found, but with strong south-eastern bias. In a variety of habitats.	0	0	0	0	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1

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000 MOLLUSCA (Slugs and Snails)	Hygromidae	*Trochulus hispidus*			Universal	Frequently found. Found in ground layer and low vegetation in various humid but not densely shaded habitats and not usually in gardens. Shows a preference for base rich soils.	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Hygromidae	*Trochulus striolatus*			Universal	Frequently found. Found in ground layer and field layer. Occurs in semi-natural habitats in south but increasingly synanthropic towards north.	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0
000 MOLLUSCA (Slugs and Snails)	Hygromiidae	*Candidula intersecta*			Universal	Frequently found. Typical habitat is dry, calcareous grassland but also occurs on base-rich sandy soils and synanthropic sites. Usually found in ground layer or field layer but occasionally climbs trees.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
000 MOLLUSCA (Slugs and Snails)	Hygromiidae	*Cernuella virgata*			Universal	Frequently found. Typical habitat is dry, calcareous grassland but also occurs on base-rich sandy soils and synanthropic sites. Usually found in ground layer or field layer but occasionally climbs trees.	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Lauriidae	*Lauria cylindracea*			Universal	Commonly found. Found in most habitats except wetlands in western Britain but increasingly restricted to walls in east.	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0

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000 MOLLUSCA (Slugs and Snails)	Limacidae	*Deroceras invadens*			Universal	Commonly found. Probably introduced but has spread rapidly and although still a synanthropic species, it is established in woodland and coastal cliffs.	0	0	0	0	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Limacidae	*Deroceras laeve*			Universal	Commonly found. Usually in open, wetland habitat of all types though sometimes in poorly drained woodland. Found in ground layer or on low vegetation.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
000 MOLLUSCA (Slugs and Snails)	Limacidae	*Deroceras reticulatum*			Universal	Very commonly found. In a variety of open habitats.	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0
000 MOLLUSCA (Slugs and Snails)	Limacidae	*Limax maximus*			Universal	Frequently found. Found in humid, sheltered habitats including woodlands and synanthropic sites. Nocturnally active when it may climb walls and trees.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Milacidae	*Tandonia budapestensis*			Universal	Commonly found. An introduced species, still spreading in Scotland especially. Associated with disturbed, synanthropic sites.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Pomatiidae	*Pomatias elegans*			Southern Widespread	Frequently found. Strongly associated with warm calcareous grasslands.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Valoniidae	*Vallonia c.f. excentrica*			Universal	Frequently found	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Valoniidae	*Vallonia costata*			Universal	Frequently found. Found in open, dry habitats on base rich soils including sand dunes and calcareous grassland.	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0

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000 MOLLUSCA (Slugs and Snails)	Vertiginidae	*Vertigo pygmaea*			Universal	Frequently found. A lowland species. Typical of dry, base rich soils but also found in marshes in west. Intolerant of shade.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Vitrinidae	*Vitrina pellucida*			Universal	Frequently found. Found in the ground layer of a wide range of calcareous or non-calcareous sites and damp or dry sites.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Zonitidae	*Aegopinella nitidula*			Universal	Very commonly found. In a variety of habitats.	0	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	1	1	0
000 MOLLUSCA (Slugs and Snails)	Zonitidae	*Oxychilus alliarius*			Universal	Very commonly found. Moist ground litter in a variety of habitats. Humid but not wet places.	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0
000 MOLLUSCA (Slugs and Snails)	Zonitidae	*Oxychilus cellarius*			Southern Widespread	Commonly found. Found in the ground layer of a wide range of habitats. Restricted to synanthropic sites in upland areas. Shows a preference for calcareous substrates.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Zonitidae	*Oxychilus draparnaudi*			Universal	Frequently found. In a variety of habitats.	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
000 MOLLUSCA (Slugs and Snails)	Zonitidae	*Oxychilus navarricus*			Southern Widespread	Commonly found. Found in the ground layer of damp habitats. Typically associated with woodland and hedgerows but by no means restricted to these habitats.	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Armadillidiidae	*Armadillidium depressum*			Southern Restricted	Commonly found. A synanthropic species favouring warm, open, calcareous sites. Occurs on walls, in screes, under stones etc and although surace active at nigt, it can burrow strongly.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

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001 ISOPODA (Woodlice)	Armadillidiidae	*Armadillidium nasatum*			Southern Widespread	Frequently found. Strongly associated with warmth, including in glasshouses. Associated with bare ground patches.	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Armadillidiidae	*Armadillidium vulgare*			Universal	Pill woodlouse. Commonly found, although scarcer in the north.	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	0	0	1	1	0
001 ISOPODA (Woodlice)	Armadillidiidae	*Eluma caelata*			Southern Widespread	Commonly found. Mainly coastal away from Kent. Naturalised on soft rock cliffs and ina variety of disturbed and synanthropic sites	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Ligiidae	*Ligidium hypnorum*			Southern Restricted	Locally commonly found. Associated with well-established woodland.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Oniscidae	*Oniscus asellus*			Universal	Very commonly found.in rotting vegetation.	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Philosciidae	*Philoscia muscorum*			Universal	Commonly found. Often at the base of hedgerows and in woodland.	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	0	0	1	1	0
001 ISOPODA (Woodlice)	Platyarthridae	*Platyarthrus hoffmannseggi*			Southern Widespread	Commonly found. Almost always found in the nests of ants, especially Lasius flavus and L. niger. Has been found with a wide range of other ant species and in southern England appears to be frequent where ever ants occur. Increasingly restricted to warm, calcareous sites on the coast further north.	0	0	1	1	1	0	1	0	0	0	0	1	0	1	1	0	0	0	1	0

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001 ISOPODA (Woodlice)	Porcellionidae	*Porcellio dilatatus*			Southern Widespread	Infrequently found. Usually in rural, synanthropic habitats e.g. farmyards, stables and gardens but a few records from disused lime kilns and others from soft rock cliffs. Found at soil surface under debris and in dung heaps and compost heaps.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Porcellionidae	*Porcellio scaber*			Universal	Very commonly found. In a wide range of habitats.	1	0	0	0	1	0	1	1	0	1	1	1	1	1	0	0	0	0	1	0
001 ISOPODA (Woodlice)	Trachelipidae	*Trachelipus rathkei*			Southern Widespread	Commonly found. In a wide range of habitats.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Trichoniscidae	*Androniscus dentiger*			Universal	Commonly found. In a wide range of habitats.	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
001 ISOPODA (Woodlice)	Trichoniscidae	*Haplophthalmus danicus*			Southern Widespread	Frequently found. In a range of habitats, especially woodland and synanthropic sites. Usually in moist microsites including decaying wood and leaf litter.	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Trichoniscidae	*Haplophthalmus mengii s.l.*			Universal	Commonly found. Known from calcareous soils in a wide range of habitats.Recognised as two separate species in 1987 but can only be distinguished by dissection of males.	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Trichoniscidae	*Trichoniscoides albidus*			Southern Widespread	Locally nfrequenly found. In damp, friable soils in various habitats, especially woodland and alluvial meadows.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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001 ISOPODA (Woodlice)	Trichoniscidae	*Trichoniscus provisorius*			Universal	Commonly found. Previously considered a sexual race of Trichoniscus pusillus and elevated to species status in 2004. Usually occurs at the soil/litter interface in various habitats. Probably prefers drier, sunnier sites than Trichoniscus pusillus s.s. and for this reason often found on calcareous substrates.	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
001 ISOPODA (Woodlice)	Trichoniscidae	*Trichoniscus pusillus s. l.*			Universal	Very commonly found. In damp soil and leaf liter. A taxonomically awkward group. All female specimens found in the absence of males have to be assigned to this taxon. The true species is triploid and parthenogenetic. Can only be distinguished from T. provisorius by dissection of males but males are very rare, c. 1% of population of this species c.f. 50% for T. provisorius. An abundant soil and litter species, probably occupying cooler damper habitats than T. provisorius.	0	0	0	1	1	0	1	1	0	1	0	1	1	1	1	0	0	0	1	0

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005 DIPLOPODA (Millipedes)	Blaniulidae	*Blaniulus guttulatus*			Universal	Commonly found. A synanthropic species but it probably originates from woodland on calcareous soils. One of the few millipedes that has been observed to feed on animal as well as plant material.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
005 DIPLOPODA (Millipedes)	Craspedosomatidae	*Nanogona polydesmoides*			Universal	Commonly found. Often considered a woodland species but common in the ground layer of most habitats. Appears to prefer calcareous substrates.	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
005 DIPLOPODA (Millipedes)	Glomeridae	*Glomeris marginata*			Southern Widespread	Commonly found. The Pill Millipede. In drier places then most millipedes.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Julidae	*Brachyiulus pusillus*			Universal	Commonly found. In upper soil layers and litter of a range of open habitats, especially on cultivated land ad grassland in south but coastal in north. Preference for clay soils.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
005 DIPLOPODA (Millipedes)	Julidae	*Cylindroiulus caeruleocinctus*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Julidae	*Cylindroiulus punctatus*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
005 DIPLOPODA (Millipedes)	Julidae	*Cylindroiulus punctatus*			Universal	Commonly found. Inhabits decaying timber.																				
005 DIPLOPODA (Millipedes)	Julidae	*Ophyiulus pilosus*			Universal	Commonly found. Typically in woodland leaf litter but known from most habitats.	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Julidae	*Tachypodoiulus niger*			Universal	Very commonly found. In a variety of habitats.	0	0	0	1	1	0	0	0	0	1	0	1	0	1	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Polydesmidae	*Brachydesmus superus*			Universal	Commonly found.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Polydesmidae	*Polydesmus angustus*			Universal	Common. Found in leaf litter, under stones etc in all habitats where humid microsites occur.	0	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0

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005 DIPLOPODA (Millipedes)	Polydesmidae	*Polydesmus coriaceus*			Southern Widespread	Commonly found. In leaf litter, under stones etc. Known from a wide range of habitats but most frequent in cultivated land, waste ground and grassland on clay soils or other soils where drainage is restricted.	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	1	1	0
005 DIPLOPODA (Millipedes)	Polydesmidae	*Polydesmus denticulatus*			Universal	Frequently found. Usually associated with humid or wet conditions in woodland and wetlands.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
005 DIPLOPODA (Millipedes)	Polydesmidae	*Polydesmus inconstans*			Universal	Commonly found. In a variety of habitats. May be found with other Polydesmus sp. but only rarely is it the most frequent species. Occurs in a wide range of habitats from moist woodland to sand dune but appears to have a particular association with grasslands. An association with calcareous soils has been noted by continental workers but is not apparent from data collected in Britain.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
005 DIPLOPODA (Millipedes)	Polydesmidae	*Propolydesmus testaceus*	Nationally Scarce Near threatened (IUCN)		Southern Restricted	Infrequently found and very local. Thermophilic and prefers base-rich soils. Especially in calcareous grassland but also post-industrial sites, caves and woodland .	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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005 DIPLOPODA (Millipedes)	Polydesmidae	*Stosatea italica*	Nationally Scarce		Southern Restricted	Locally commonly found.Presumed to be an ancient introduction but rarely recorded outside Kent. Known from a variety of semi-natural and synanthropic habitats but almost always on calcareous soils.	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Cryptopidae	*Cryptops anomalans*			Southern Restricted	Infrequently found. Probably an introduction but naturalised in synanthropic sites.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Cryptopidae	*Cryptops hortensis*			Universal	Commonly found. Known from a range of habitats but essentially synanthropic, exclusively so in north. A species of the soil/litter interface and upper soil layers.	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Geophilidae	*Geophilus electricus*			Universal	Infrequently found. A synanthropic species. A soil dwelling species rarely seen at the surface.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Geophilidae	*Geophilus flavus*			Universal	Very commonly found in a wide variety of habitats.	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
006 CHILOPDA (Centipedes)	Geophilidae	*Geophilus truncorum*			Universal	Commonly found. A rural species typically in woodland where it is usually found under bark on dead wood. Also found in grassland and moorland.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Geophilidae	*Henia vesuviana*			Universal	Locally frequently found. A thermophile known from a wide range of semi-natural habitats but usually synanthropic away from the coast. Found at soi/litter boundary and in upper soil layers.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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006 CHILOPDA (Centipedes)	Geophilidae	*Stenotaenia linearis*			Universal	Localll frequent. Naturalised in synanthropic sites, especially gardens.Probably lives within soil.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Himantariidae	*Haplophilus subterraneus*			Universal	Frequently found. The species is typically found in woodland soil in the south-west. However, it occurs in a wide range of other habitats and is a common synanthrope.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Lithobiidae	*Lithobius forficatus*			Universal	Commonly found. More synanthropic in north and west.	0	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	1	1	0
006 CHILOPDA (Centipedes)	Lithobiidae	*Lithobius melanops*			Universal	Commonly found. in vegetation litter, usually rather drier places than many species.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
006 CHILOPDA (Centipedes)	Lithobiidae	*Lithobius microps*			Universal	Commonly found. A variety of habitats.	0	0	0	1	1	0	1	0	0	1	0	1	1	1	0	0	0	1	1	0
006 CHILOPDA (Centipedes)	Schlendylidae	*Schendyla nemorensis*			Universal	Commonly found. A synanthropic species. Found throughout soil horizon but also above ground in bracket fungi.	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0
009 Prostigmata (Mites)	Eriophyidae	*Aceria ilicis*			Southern Restricted	Frequently found found. Makes galls on Holm Oak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
009 Prostigmata (Mites)	Eriophyidae	*Eriophyes prunispinosae*			Universal	Commonly found . Makes galls on Balckthorn.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Agelenidae	*Agelena labyrinthica*			Southern Widespread	Commonly found. Amongst rough grassland and heathland. It spins its funnel web near ground level amongst tall vegetation, heather and occasionally in gorse preying on mainly grasshoppers.	0	0	1	0	0	1	1	0	0	0	0	0	1	1	1	0	0	1	0	0

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010 ARANEAE (Spiders)	Agelenidae	*Tegenaria gigantea*			Universal	Commonly found. Increasingly local in south west England, Wales, northern England and Scotland where T. saeva is often the most abundant large house spider. Hybridisation in the overlap zone causes problems for identification.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Agelenidae	*Tegenaria silvestris*			Southern Widespread	Frequently found. A woodland species found under fallen dead wood or uprooted tree roots.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Anyphaenidae	*Anyphaena accentuata*			Southern Widespread	Commonly found on the lower branches of trees in woodland.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Araneidae	*Agalenatea redii*			Southern Widespread	Local but commonly found in southern Britain amongst tall vegetation on rough grassland and heathland.	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	1	1	0
010 ARANEAE (Spiders)	Araneidae	*Araneus diadematus*			Universal	Commonly found. Amongst tall vegetation and scrub in a variety of habitats.	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0
010 ARANEAE (Spiders)	Araneidae	*Araneus quadratus*			Universal	Commonly found. Amongst tall vegetation in a variety of habitats but usually in wetter areas.	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0
010 ARANEAE (Spiders)	Araneidae	*Araneus triguttatus*			Southern Restricted	Locally commonly found. On scrub and the lower branches of trees on woodland edge and other scrubby habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Araneidae	*Araniella cucurbitina s.s.*			Universal	Commonly found. On tall vegetation, scrub and the lower branches of trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
010 ARANEAE (Spiders)	Araneidae	*Araniella opisthographa*			Southern Widespread	Commonly found. On tall vegetation, scrub and the lower branches of trees.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0

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010 ARANEAE (Spiders)	Araneidae	*Argiope bruennichi*	Nationally Scarce a		Southern Restricted	Frequently found, but very southern, Expanding range recently. The species preys particularly on Grasshoppers.	0	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0
010 ARANEAE (Spiders)	Araneidae	*Hypsosinga pygmaea*			Southern Widespread	Infrequently found and local amongst tall vegetation on rough grassland and heathland, usually in damp areas.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Araneidae	*Larinioides cornutus*			Universal	Commonly found. Widespread on water side vegetation.	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0
010 ARANEAE (Spiders)	Araneidae	*Mangora acalypha*			Southern Restricted	Locally commonly found. Not restricted to heathland but is most common in this habitat.	0	0	0	0	0	1	1	0	0	1	0	1	0	1	1	0	0	1	1	0
010 ARANEAE (Spiders)	Araneidae	*Neoscona adianta*			Southern Restricted	Infrequently found and largely coastal. The spider spins an orb web amongst tall vegetation on grasslands, heathland, wetlands and saltmarsh.	1	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	1	1	0
010 ARANEAE (Spiders)	Araneidae	*Zilla diodia*	Nationally Scarce b		Southern Restricted	Locally frequently found. On heather, tall vegetation and patches of scrub on heathland, open woodland and hedgerows.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Cheiracanthium erraticum*			Southern Widespread	Locally commonly found. Amongst tall vegetation on rough grassland and heathland, usually in wetter areas.	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Cheiracanthium virescens*			Southern Restricted	Infrequently found amongst Calluna and Erica spp. and at ground level under stones on heathland.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona comta*			Universal	Commonly found On scrub and the branches of trees.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona juvensis*	RDB 2		Southern Restricted	Frequently found, but very local. Usually found in reedbed and fen.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

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010 ARANEAE (Spiders)	Clubionidae	*Clubiona lutescens*			Universal	Commonly found. Found in all layers of most habitats from under stones on the sea shore to woodland canopy.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona neglecta*			Universal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona phragmitis*			Southern Widespread	Commonly found. Often in reed flower heads. Extends into Scotland as a coastal species.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona reclusa*			Universal	Commonly found. Widespread in low vegetation in a wide range of habitats.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona stagnatilis*			Universal	Localy commonly found, In the ground layer of wetlands including saline grasslands and marsh but especially especially in freshwater fens and marshes.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona subtilis*			Southern Restricted	Frequently found, but local. It occurs mainly at ground level in wetlands, wet heathland and sand dunes.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Clubionidae	*Clubiona terrestris*			Southern Widespread	Commonly found. In a variety of habitats either at ground level or in tall vegetation and scrub.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Dictynidae	*Argenna patula*	Nationally Scarce b		Southern Widespread	Frequently found. A coastal species with one record from SW Scotland and scattered records further south but stronghold is East Anglia and Thames Estuary.Usually collected from the ground layer of estuarine habitats, especially saltmarsh.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Dictynidae	*Argenna subnigra*			Southern Restricted	Infrequently found.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0

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010 ARANEAE (Spiders)	Dictynidae	*Dictyna arundinacea*			Universal	Commonly found. Widespread in Britain in a variety of habitats. Requires tall dead vegetation and low scrub such as heather and gorse.	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	1	0
010 ARANEAE (Spiders)	Dictynidae	*Dictyna latens*			Southern Restricted	Infrequently found and local. Not restricted to heathland but is most common in this habitat, usually found on heather and gorse.	0	0	0	0	0	1	1	0	0	0	0	1	0	1	1	1	0	1	1	0
010 ARANEAE (Spiders)	Dictynidae	*Dictyna uncinata*			Southern Widespread	Commonly found. Occurs in the same situations as D. arundinacea.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Dysderidae	*Dysdera crocata*			Universal	Commonly found. Under stones and logs in a variety of habitats	0	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Dysderidae	*Dysdera erythrina*			Southern Restricted	Locally frequently found. A predator of woodlice. Found under stones and vegetable litter.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Dysderidae	*Harpactea hombergi*			Southern Widespread	Frequently found. Under stones, bark and leaf litter.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Drassodes cupreus*			Universal	Commonly found. Under stones and in leaf litter.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Drassodes lapidosus*			Southern Widespread	Locally frequently found.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Drassodes pubescens*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Drassyllus pusillus*			Restricted	Infrequently found. At ground level on dry open habitats such as heathland and chalk grassland.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Drasyllus pusillus*			Universal	Locally frequently found. Usually in the ground layer of dry habitats, especially lowland sandy heath and chalk grassland.	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Gnaphosidae	*Haplodrassus signifer*			Widespread	Frequently found but local. It occurs at ground level in heathland and grasslands.	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Micaria pulicaria*			Southern Widespread	Commonly found.	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0

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010 ARANEAE (Spiders)	Gnaphosidae	*Trachyzelotes pedestris*	Nationally Scarce b		Southern Restricted	Frequently found. On calcareous, sandy and coastal grassland.	0	1	0	1	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Gnaphosidae	*Zelotes apricorum*			Southern Widespread	Frequently found. In a wide range of habitats, generally warm and dry.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Gnaphosidae	*Zelotes latreillei*			Universal	Commonly found	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Hahniidae	*Antistea elegans*			Universal	Commonly found among low vegetation in marshy places.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Hahniidae	*Hahnia nava*			Universal	Commonly found. Under moss and stones in open habitats.	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Bathyphantes approximatus*			Universal	Locally commonly found. In the ground layer and low vegetation of a range of habitats but most frequent in damp microsites.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Bathyphantes gracilis*			Universal	Commonly found. In many different habitats.	1	1	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Centromerus sylvaticus*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Ceratinella brevipes*			Universal	Commonly found. At ground level, in litter and in vegetation in a range of habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Cnephalocotes obscurus*			Universal	Frequently found. Under moss and leaf litter in a variety of habitats.	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Diplocephalus cristatus*			Widespread	Commonly found. In grassland habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Diplocephalus graecus*			Southern Restricted	Rarely found. Not recognised in Britian until 2008 but has been spreading north in Europe. A single male collected from dunes in Kent (2008), one male and one female collected from a reed bed in Kent (2009) and a male beaten from ancient oaks in Surrey (2009).	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Diplostyla concolor*			Universal	Commonly found. Usually found in ground layer, occasionally in field layer, of a wide range of habitats.	0	1	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Erigone atra*			Universal	Commonly found. Widespread in Britain. It is found at ground level and on short vegetation in a wide range of habitats.	0	1	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Erigone dentipalpis*			Universal	Commonly found. At ground level and on short vegetation in a wide range of habitats.	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Erigone longipalpis*			Universal	Infrequently found. Usually found in coastal wetland habitats, especially saltmarshes but also known from damp floodplain grasslands inland.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Erigonella hiemalis*			Universal	Commonly found. Widespread in Britain. It is found at ground level and on short vegetation in a wide range of habitats.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Gnathonarium dentatum*			Universal	Frequently found at ground level in marshes	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Gongylidiellum vivum*			Universal	Often common, especially in ground layer of damp sites and has been shown to prefer undisturbed, well vegetated grassland.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Hypomma bituberculatum*			Universal	Commonly found. In wetland habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Hypomma fulvum*	Nationally Scarce a		Southern Restricted	Very locally commonly found. Strongly, but not exclusively, associated with fens and reed beds.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Kaestneria pullata*			Southern Widespread	Commonly found. Widespread amongst low vegetation in wetland habitats.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Lepthyphantes pallidus*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Linyphia hortensis*			Universal	Locally commonly found. On low field-layer vegetation in woodlands.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Linyphia triangularis*			Universal	Commonly found to abundant, on tall vegetation and low scrub.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Lophomma punctatum*			Universal	Local but often frequent where it occurs. In ground layer and low field layer of most wetland habitats.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Maso sundevalli*			Widespread	Commonly found. In a wide range of habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Meioneta rurestris*			Universal	Commonly found in a wide range of habitats.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Meioneta saxatilis s.s.*			Universal	Commonly found. Usually found in the ground layer of a range of habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Micrargus herbigradus s.s.*			Universal	Commonly found. In litter in a variety of habitats.	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Micrargus subaequalis*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Microlinyphia pusilla*			Widespread	Commonly found. In a wide range of habitats.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Microneta viaria*			Universal	Commonly found in vegetation litter in a wide variety of habitats.	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Neriene clathrata*			Widespread	Commonly found. In a wide range of habitats.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Oedothorax apicatus*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Oedothorax fuscus*			Widespread	Commonly found. In a wide range of habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Palliduphantes ericaeus*			Universal	Commonly found. Found in the ground layer of a variety of sites.	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Panamomops sulcifrons*			Southern Widespread	Infrequently found and local. Usually found in the ground layer of cultivated land and grassland.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Pelecopsis nemoralioides*			Universal	Local but may be frequent where found. Most records are from coastal habitats, especially dunes, but also known from short calcareous grassland.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Pelecopsis parallela*			Southern Widespread	Frequently found. It occurs in a wide range of habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Pocadicnemis juncea*			Universal	Commonly found. In a variety of habitats.	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Porrhomma pygmaeum*			Universal	Frequently found. In a wide range of habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Praestigia duffeyi*	RDB 3 A UK BAP/s41 species	S41	Southern Restricted	Very local but can be abundant where found.Thames estuary - east coast toSuffolk? Saltmarsh zone?	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Tenuiphantes flavipes*			Southern Widespread	Commonly found. At ground level in litter, moss and short vegetation in a range of habitats.	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Tenuiphantes mengei*			Universal	Frequently found. Usually in the ground layer or field layer of a variety of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Tenuiphantes tenuis*			Universal	Very commonly found. Almost ubiquitous species found in a wide range of habitats.	0	1	0	0	1	0	1	1	0	1	0	1	0	1	0	0	0	1	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Tenuiphantes zimmermanni*			Universal	Commonly found. In litter and on vegetation mainly in woodland but can be found in other habitats.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria acuminata*			Universal	Commonly found. In a wide range of habitats, usually at ground level.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria antica*			Southern Widespread	Commonly found. Widespread in a wide range of habitats.	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria atrotibialis*			Universal	Local and infrequent., especially in the north. Found in the ground layer of most habitats.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria nudipalpis*			Universal	Commonly found. Variety of damp habitats.	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria unicornis*			Unknown	Data not available	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Linyphiidae (Money Spiders)	*Walckenaeria unicornis*			Universal	Infrequently found. Usually in ground layer of damp areas but from a wide range of habitats, not just wetland.																				
010 ARANEAE (Spiders)	Linyphilidae	*Meioneta simplicitarsis*	Nationally Scarce a		Southern Restricted	Infrequently found. Dry, calcareous grassland, very damp meadows including coastal grazing marshes and sea cliffs. It is also recorded in old chalk pits and other post industrial sites.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Liocranidae	*Agroeca inopina*			Southern Restricted		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Liocranidae	*Agroeca proxima*					0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Liocranidae	*Phrurolithus festivus*			Southern Restricted	Frequently found. Usually seen running about on bare ground exposed to the sun, or under stones. An ant mimic and usually seen in the company of ants.	0	1	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	1	0
010 ARANEAE (Spiders)	Liocranidae	*Scotina celans*			Universal	Infrequently found and local, especially in the north. Found in the ground layer of woodland and heathland.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae	*Pardosa agricola*			Universal	Frequently found. Areas of bare or sparsely vegetated ground where the spider is usually found.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Alopecosa pulverulenta*			Universal	Commonly found. At ground level in short vegetation in grasslands and heathlands.	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	0	0	1	0

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010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Arctosa fulvolineata*	RDB 3 UK BAP	S41	Southern Restricted	Localy frequently found. Confined to a few coastal sites, almost always saltmarshes, from the Solent to Suffolk.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Arctosa leopardus*			Universal	Commonly found. Associated with marshy vegetation within a variety of habitats, particularly areas that are seasonally flooded. It is diurnal and hunts on bare ground and amongst low marshy vegetation and makes a silken retreat amongst low vegetation.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa agrestis*	Nationally Scarce b		Universal	Commonly found. On bare or disturbed soils.	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa amentata*			Universal	Commonly found. Associated with humid areas in open situations.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa hortensis*			Southern Restricted	Frequently found. In open sparsely vegetated habitats such as heathland, waste ground and cliffs.	0	1	0	0	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa nigriceps*			Universal	Commonly found in a range of habitats, usually higher up in vegetation than other wolf spiders.	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	0	1	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa palustris*			Southern Widespread	Commonly found. On sparsely vegetated areas in heathland, grassland and other habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa prativaga*			Southern Widespread	Commonly found. Widespread in southern Britain in a wide range of habitats.	1	1	0	1	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa pullata*			Universal	Commonly found. At ground level in a wide range of habitats.	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0

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010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pardosa purbeckensis*			Universal	Frequently found, but local. A coastal species of saltmarsh and inter tidal mud.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pirata hygrophilus*			Southern Widespread	Frequently found. Among low vegetation in marshy places.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Pirata piraticus*			Universal	Commonly found amongst low vegetation and at ground level in wetland habitats.	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Trochosa ruricola*			Universal	Commonly found. Widespread in the south but becoming very local and confined to lowlands in the north.A ground layer species often found in damper microsites within open habitats.	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0
010 ARANEAE (Spiders)	Lycosidae (Wolf Spiders)	*Trochosa terricola*			Universal	Commonly found. At ground level in a wide range of habitats.	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Nesticidae	*Nesticus cellulanus*			Universal	Infrequently found, perhaps because it is subteranean. In damp, subterranean microsites including caves and mines but also under man-hole covers, in hollow trees and under thick layers of moist litter in woodland and in wetlands.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Philodromidae	*Philodromus albidus*	Nationally Scarce b		Southern Widespread	Locally frequently found. Usually found on the lower branches of oak on woodland edge and in hedgerows.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0
010 ARANEAE (Spiders)	Philodromidae	*Philodromus aureolus*			Southern Widespread	Commonly found. On scrub, heather and the lower branches of trees in woodland and other scrubby habitats.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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010 ARANEAE (Spiders)	Philodromidae	*Philodromus cespitum*			Southern Widespread	Commonly found. On scrub, heather and the lower branches of trees in woodland and other scrubby habitats.	1	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	1	1	1	0
010 ARANEAE (Spiders)	Philodromidae	*Tibellus oblongus*			Southern Widespread	Commonly found in habitats with tall grassy vegetation.	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0
010 ARANEAE (Spiders)	Pisauridae	*Pisaura mirabilis*			Southern Widespread	Commonly found. Found in habitats with tall grassy vegetation.	1	1	0	0	0	1	1	0	0	1	0	1	1	1	0	1	0	0	1	0
010 ARANEAE (Spiders)	Salticidae	*Sitticus distinguendus*	Section 41	S41	Southern Restricted	Rarely found. sparsely vegetated areas on fine flue ash and clinker, free draining substrates similar to the grey dune habitat it occurs in on the near continent. Elsewhere in Europe it has been collected from a wider range of habitats including saltmarsh, scree and steppe.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Euophrys frontalis*			Southern Widespread	Commonly found, in a wide variety of habitats at ground level.	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Heliophanus cupreus*			Southern Restricted	Frequently found, but local. On vegetation and at ground level in a wide range of habitats.	0	1	0	0	0	1	1	0	0	1	0	0	0	1	0	1	0	0	1	0
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Heliophanus flavipes*			Southern Widespread	Frequently found, but local. Found on vegetation and at ground level in a wide range of habitats.	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	1	1	1
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Salticus scenicus*			Southern Widespread	Very commonly found. On walls and stones, exposed tree trunks in sun.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0

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010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Sibianor aurocinctus*	Nationally Scarce a		Southern Restricted	Infrequently found and local. Most records coming from the Thames basin. Does not seem to be associated with any particular habitat but does require warm, dry sparsely vegetated areas.	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Synageles venator*	Nationally Scarce a		Southern Restricted	Infrequently found. Typical of sand dunes but also known from brownfield sites and a few fens. Usually found with ants.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Salticidae (Jumping Spiders)	*Talavera aequipes*			Southern Widespread	Frequently found but local. In warm, open sunny habitats such as cliffs, waste ground and stony banks.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Tetragnathidae	*Metellina mengei*			Universal	Commonly found. Widespread in almost all habitats.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Tetragnathidae	*Metellina segmentata*			Universal	Commonly found in almost all habitats.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
010 ARANEAE (Spiders)	Tetragnathidae	*Pachygnatha clercki*			Universal	Commonly found. Wdespread in a wide range of damp habitats at ground level or in short vegetation.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Tetragnathidae	*Pachygnatha degeeri*			Universal	Commonly found. Widespread in a wide range of habitats at ground level or in short vegetation.	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Tetragnathidae	*Tetragnatha extensa*			Universal	Commonly found. Widespread in a wide range of damp habitats in tall vegetation.	1	1	0	1	0	1	1	0	0	0	0	1	0	0	1	0	0	1	1	0
010 ARANEAE (Spiders)	Tetragnathidae	*Tetragnatha montana*			Universal	Commonly found. Widespread in a wide range of habitats in tall vegetation. Not as closely associated with water as T.extensa.	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	1	0

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010 ARANEAE (Spiders)	Theridiidae	*Kochiura aulica*	Nationally Scarce b		Southern Restricted	Infrequently found unless searched for by hand in semi-natural habitat. Typically constructs webs on gorse so characteristic of lowland heath and dry grassland. Also occurs on post-industrial sites where it may construct webs in short vegetation (<30cm) and is found more frequently here as it can be collected by sweeping.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae	*Phylloneta impressa*			Universal	Frequent in central southern England, but infrequent and even rare further to west, north and east. Found in wide range of mainly open habitats where webs may be constructed in the field layer, on shrubs and in the canopy.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae	*Phylloneta sisyphia*			Universal	Common in Wales and southern England, increasingly scattered and infrequent in northern England and Scotland. Found in wide range of mainly open habitats where webs may be constructed in the field layer, on shrubs and in the canopy.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Anelosimus vittatus*			Southern Widespread	Commonly found. Widespread in southern Britiain, rare in the north. Found on the lower branches of trees and on scrub.	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Enoplognatha latimana*			Southern Widespread	Commonly found. Amongst tall vegetation in open sunny habitats.	0	1	0	0	0	1	1	0	1	0	0	1	0	1	1	1	0	1	1	0

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010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Enoplognatha ovata s.s.*			Universal	Commonly found. Widespread in a wide range of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Enoplognatha thoracica*			Universal	Commonly found. Under stones and in leaf litter.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Episinus angulatus*			Southern Widespread	Infrequently found. Amongst tall vegetation in a wide range of habitats.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Neottiura bimaculata*			Southern Widespread	Commonly found. Found in a wide range of habitats amongst tall vegetation and scrub.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Paidiscura pallens*			Southern Widespread	Commonly found. Widespread on tall vegetation, scrub and the lower branches of trees.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Pholcomma gibbum*			Southern Widespread	Commonly found. At ground level amongst short vegetation.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Robertus lividus*			Universal	Commonly found. Ground living species in a variety of habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Simitidion simile*			Southern Restricted	Locally frequently found. Not restricted to heathland but is most common on southern heathland where it can be abundant on heather and gorse.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
010 ARANEAE (Spiders)	Theridiidae (Comb-foot Spiders)	*Theridion pictum*			Southern Widespread	Frequently found. Tall vegetation and scrub.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Thomisidae	*Misumena vatia*			Southern Widespread	Locally commonly found. Mainly found in tall vegetation and scrub in the scrub/grassland interface.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1
010 ARANEAE (Spiders)	Thomisidae	*Ozyptila brevipes*			Southern Restricted	Infrequently found. Local. Among patchy short vegetation or under stones.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Thomisidae	*Ozyptila praticola*			Southern Widespread	Commonly found. In vegetation litter in a variety of habitats.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

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010 ARANEAE (Spiders)	Thomisidae	*Ozyptila sanctuaria*			Southern Restricted	Infrequently found. Among low vegetation or under stones.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Thomisidae	*Ozyptila simplex*			Southern Restricted	Locally frequently found. Most records are from coastal habitats, especially dunes and grassland, but also known from inland grassland.	0	1	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0
010 ARANEAE (Spiders)	Thomisidae	*Ozyptila trux*			Universal	Commonly found. In low vegetation and plant detrius	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
010 ARANEAE (Spiders)	Thomisidae	*Xysticus cristatus*			Universal	Commonly found. Widespread throughout Britain in sunny situations in a wide range of habitats.	1	0	0	0	0	1	1	0	0	0	0	1	0	1	1	0	1	1	1	0
010 ARANEAE (Spiders)	Thomisidae	*Xysticus kochi*			Universal	Frequently found, but local Amongst short vegetation in warm, dry habitats.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0
010 ARANEAE (Spiders)	Zodariidae	*Zodarion italicum*			Southern Restricted	Locally commonly found, especially in the Thames corridor. In early successional habitat with high insolation, high summer temperatures and mild winters.	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
010 ARANEAE (Spiders)	Zoridae	*Zora spinimana*			Southern Widespread	Commonly found. In open habitats at ground level and in plant debris.	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Leiobunidae	*Dicranopalpus ramosus*			Southern Restricted	Frequently found, but local. On tall vegetation and scrub.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
020 OPILIONES (Harvestmen)	Leiobunidae	*Leiobunum rotundum*			Southern Widespread	Commonly found. On tall vegetation and heather.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
020 OPILIONES (Harvestmen)	Nemastomatidae	*Mitostoma chrysomelas*			Universal	Infrequently found. Under stones and in litter.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Nemastomatidae	*Nemastoma bimaculatum*			Universal.	Very commonly found.	0	1	0	0	1	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Lophopilio palpinalis*			Universal	Commonly found. In the ground layer of woodland.	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Odiellus spinosus*			Southern Widespread	Commonly found. In a variety of habitats	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Oligolophus tridens*			Universal	Commonly found.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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020 OPILIONES (Harvestmen)	Phalangiidae	*Opilio canestrii*			Universal	Commonly found, but very local. A recent colonist. A synanthropic species often found in the canopy or shrub layer.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Opilio parietinus*				Frequently found. appears to be declining. In a range of habitats but probably most often recorded in synanthropic sites. There are concerns that the recently arrived O. canestrinii may displace it, especially in urban habitats, as this has occurred in continental Europe.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Opilio saxatilis*			Universal	Frequently found. In the ground layer of most habitats.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Phalangium opilio*			Universal	Commonly found. Tall vegetation, heather	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
020 OPILIONES (Harvestmen)	Phalangiidae	*Platybunus triangularis*			Universal	Commonly found.	0	1	0	1	1	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0
020 OPILIONES (Harvestmen)	Sclerosomatidae	*Homalenotus quadridentatus*			Southern Restricted	Frequently found. A predominately southern species associated with warm grasslands.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
020 OPILIONES (Harvestmen)	Troguldae	*Anelasmocephalus cambridgei*			Southern Widespread	Frequently found but often overlooked. Usually in ground layer of grassland or woodland.	0	0	0	1	1	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
030 PSEUDOSCORPIONES (Pseudoscorpions)	Chthoniidae	*Chthonius ischnocheles*			Southern Widespread	Comonly found. Apparently local, but this may well be a recording effect as finding Pseudoscorpions needs its own technique.	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0
030 PSEUDOSCORPIONES (Pseudoscorpions)	Neobisiidae	*Neobisium carcinoides*			Universal	Commonly found. Litter under molinia in damp places .	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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040 ODONATA (Damsel and Dragonflies)	Aeshnidae (Hawker Dragonflies)	*Aeshna cyanea*			Universal	Commonly found in the south, but scarcer towards the north. Breeds in still waters of various sizes, including garden ponds. Possibly associated with open woodland conditions.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Aeshnidae (Hawker Dragonflies)	*Aeshna grandis*			Southern Widespread	Brown Hawker Dragonfly. Commonly found. The larvae breed in static and slow-flowing water, and the adults often occur away from the breeding sites.	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Aeshnidae (Hawker Dragonflies)	*Aeshna mixta*			Southern Widespread	Frequently found. Associated with well-vegetated, still water bodies.	0	1	0	0	0	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Aeshnidae (Hawker Dragonflies)	*Anax imperator*			Southern Restricted	Emperor Dragonfly. Frequently found. A species of open ponds with submerged vegetation.	0	1	1	0	0	1	1	1	0	0	0	1	1	1	0	0	0	1	0	0
040 ODONATA (Damsel and Dragonflies)	Aeshnidae (Hawker Dragonflies)	*Brachytron pratense*			Universal	Uncommonly found, but becoming more widespread and frequent. Associated with tall emergent vegetation at the edges of still water	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Coenagrionidae (Damselflies)	*Coenagrion puella*			Universal	Commonly found. It breeds in still or slow-flowing water of ponds, ditches and canals. Very local in lowland Scotland.	0	0	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0	0	1	0
040 ODONATA (Damsel and Dragonflies)	Coenagrionidae (Damselflies)	*Enallagma cyathigerum*			Universal	Common Blue Damselfly. Commonly found. Breeds in a variety of open waters.	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
040 ODONATA (Damsel and Dragonflies)	Coenagrionidae (Damselflies)	*Ischnura elegans*			Universal	Blue-tailed Damselfly. Commonly found. A very adaptable species as a larva.	0	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	0	0	0	0

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040 ODONATA (Damsel and Dragonflies)	Coenagrionidae (Damselflies)	*Pyrrhosoma nymphula*			Universal	Large Red Damselfly. Commonly found. Breeds in all types of still and flowing water and is tolerant of acidic, slightly brackish and mildly polluted conditions.	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Lestidae	*Lestes viridis*			Southern Restricted	Willow Emerald Damselfly. Frequently found. A recent colonist which is well established in East Anglia and the north Kent marshes.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	*Libellula depressa*			Southern Widespread	Broad-bodied Chaser Dragonfly. Commonly found. Associated with still water bodies with aquatic vegetation. Often an early colonist of new ponds.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	*Libellula quadrimaculata*			Universal	Four-spotted Chaser Dragonfly. Commonly found. Uses a variety of water-bodies.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
040 ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	*Orthetrum cancellatum*			Southern Restricted	Black-tailed Skimmer. Frequently found. Associated with open, still waterbodies, which may be brackish.	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	1	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	*Sympetrum sanguineum*	Nationally Scarce b		Southern Widespread	Ruddy Darter. Frequently found, but local. Currently increasing in frequency and range. It breeds in ponds and ditches with luxuriant vegetation.	0	1	0	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0
040 ODONATA (Damsel and Dragonflies)	Libellulidae (Darter Dragonflies)	*Sympetrum striolatum*			Universal	Common Darter Dragonfly. Abundantly found. Associated with a range of still and slowly-flowing water bodies.	0	1	1	1	0	0	1	1	0	1	1	1	0	1	0	1	0	0	1	0

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050 Ephemeroptera	Baetidae	*Cloeon dipterum*			Universal	Commonly found. The larvae develop in slow-flowing or still water bodies.	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Acrididae (Grasshoppers)	*Chorthippus albomarginatus*			Southern Restricted	Lesser Marsh Grasshopper. Locally common in wet grasslands in southen and midland England. Tends to be coastal.	0	1	1	1	0	0	1	0	1	1	0	0	1	1	1	1	1	1	1	1
060 ORTHOPTERA (Crickets and Grasshoppers)	Acrididae (Grasshoppers)	*Chorthippus brunneus*			Universal	Field Grasshopper. Commonly found. A ready coloniser of disturbed areas with a sparse vegetation.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
060 ORTHOPTERA (Crickets and Grasshoppers)	Acrididae (Grasshoppers)	*Chorthippus parallelus*			Universal	Meadow Grasshopper. Commonly found in a variety of grassy habitats.	0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1
060 ORTHOPTERA (Crickets and Grasshoppers)	Acrididae (Grasshoppers)	*Omocestus viridulus*			Universal	Common Green Grasshopper. Commonly found. Long grass in moister situations.	0	1	0	1	0	0	1	1	0	0	0	0	0	0	1	0	1	1	0	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tetrigidae (Groundhoppers)	*Tetrix subulata*			Southern Widespread	Slender Ground-hopper. Frequently found in wet places.	0	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	1	0	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tetrigidae (Groundhoppers)	*Tetrix undulata*			Universal	Common Ground-hopper. Commonly found in damp places with areas of bare mud.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Conocephalus dorsalis*			Southern Restricted	Short-winged Cone-heaad. Frequently found in marshy places throughout southern England.	1	0	1	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Conocephalus fuscus*	Nationally Scarce a		Southern Widespread	Long-winged Cone-head. Commonly found. Increasingly widespread throughout southern England.	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	0	0	1	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Leptophyes punctatissima*			Southern Widespread	Speckled Bush-cricket. Commonly found. Strongly biased towards southern England and Wales. Scrub.	0	1	0	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Meconema meridionale*			Southern Restricted	Short-winged Oak Bush-cricket. New to Britain in 2001.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0

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060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Meconema thalassinum*			Southern Widespread	Oak Bush-cricket. Commonly found. Wooded localities in the southern British Isles.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Metrioptera roeselii*	Nationally Scarce b		Southern Restricted	Roesel's Bush-cricket. Commonly found in long grasslands and spreading rapidly in southern Britain.	0	1	1	1	0	0	1	0	1	1	0	0	1	1	1	0	0	1	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Pholidoptera griseoaptera*			Southern Widespread	Dark Bush-cricket. Commonly found. A species of scrub.	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
060 ORTHOPTERA (Crickets and Grasshoppers)	Tettigoniidae (Bush Crickets)	*Tettigonia viridissima*			Southern Restricted	Great Green Bush Cricket. Locally frequently found. Associated with scrubby grassland, but needs thin turf for oviposition.	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
070 DERMAPTERA (Earwigs)	Forficulidae (Earwigs)	*Apterygida media*	Nationally Scarce b		South-eastern Restricted	Infrequently found. Associated with warm areas of scrub and grassland in the extreme south-east of England.	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0
070 DERMAPTERA (Earwigs)	Forficulidae (Earwigs)	*Forficula auricularia*			Universal	Common Earwig. Very commonly found.	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0
070 DERMAPTERA (Earwigs)	Forficulidae (Earwigs)	*Forficula lesnei*	Nationally Scarce b		Southern Restricted	Adults occur in rank vegetation and hedgerows. A local species with recent records confined to south-east England.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Chrysopidae (Green Lacewings)	*Chrysopa perla*			Universal	Commonly found. The larvae feed on aphids on deciduous trees.	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	1	1	1	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Chrysopidae (Green Lacewings)	*Chrysoperla carnea agg.*			N/A	Commonly found. A green lacewing which turns pink during the winter when it hibernates. Recent work has shown that carnea contains several species separable only with great difficulty.	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Chrysopidae (Green Lacewings)	*Dichochrysa prasina*			Southern Widespread	Commonly found. It occurs in a variety of habitats, usually with trees or scrub, where both adult and larva eat aphids.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0

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090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Hemerobius humulinus*			Universal	Commonly found. The larvae feed on aphids on deciduous trees and shrubs.	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Hemerobius lutescens*			Universal	Commonly found. It occurs in most habitats on trees and shrubs.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Micromus angulatus*			Southern Widespread	Local and infrequently found. In a variety of habitats.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Micromus pagana*			Universal	Commonly found. In a wide variety of habitats	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Micromus variegatus*			Universal	Commonly found. The larvae feed on aphids on tall grasses and forbs	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Sympherobius pygmaeus*			Southern Widespread	Commonly found. Adults and larvae are predatory and found on oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Hemerobiidae (Brown Lacewings)	*Wesmaelius subnebulosus*			Universal	Commonly found. Adults and larvae are arboreal and predatory	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Panorpidae (Scorpionflies)	*Panorpa communis*			Universal	Commonly found. It occurs in scrubby and woodland areas.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Panorpidae (Scorpionflies)	*Panorpa germanica*			Universal	Commonly found. It occurs in scrubby and woodland areas.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
090 MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)	Sialidae	*Sialis lutaria*			Universal	Commonly found	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
110 TRICHOPTERA (Caddisflies)	Leptoceridae	*Mystacides longicornis*			Universal	Commonly found. It breeds in static and slow moving water, preferring areas that dry up in summer.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Limnephilidae	*Limnephilus affinis*			Universal	Commonly found. It breeds in acidic water bodies which often dry up during the summer.	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Limnephilidae	*Limnephilus lunatus*			Universal	Commonly found. Larvae breed in pools which may dry up in summer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
110 TRICHOPTERA (Caddisflies)	Limnephilidae	*Limnephilus marmoratus*			Universal	Commonly found. Trickles, temporary ditches and pools.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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110 TRICHOPTERA (Caddisflies)	Limnephilidae	*Limnephilus rhombicus*			Universal	Commonly found. It breeds in static and slow moving water, preferring areas that dry up in summer.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Polycentropodidae	*Cyrnus trimaculatus*			Universal	Commonly found. It breeds in static and slow moving water.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Polycentropodidae	*Holocentropus picicornis*			Universal	Commonly found. It breeds in static and slow moving water.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Polycentropodidae	*Limnephilus auricula*			Universal	Commonly found. It breeds in pools which dry up in summer.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
110 TRICHOPTERA (Caddisflies)	Psychomyiidae	*Tinodes waeneri*			Universal	Commonly found. The larvae are in lakes and slow-flowing rivers.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Acanthosomatidae (Sheildbugs)	*Acanthosoma haemorrhoidale*			Southern Widespread	Commonly found, on hawthorn.	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Acanthosomatidae (Sheildbugs)	*Elasmostethus interstinctus*			Universal	Locally frequently found, on birch	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Acanthosomatidae (Sheildbugs)	*Elasmucha grisea*			Universal	Commonly found. On birch Betula species	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Alydidae	*Alydus calcaratus*			Southern Restricted	Locally frequently found, on heathland	0	1	0	1	0	0	0	0	0	0	0	1	1	0	1	1	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Aneuridae	*Aneurus avenius*			Southern Restricted	Infrequently found. Lives beneath the bark of dead trees.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Berytinus crassipes*			Southern Widespread	Locally frequently found. Feeds on chickweeds.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Berytinus hirticornis*	Nationally Scarce		Southern Restricted	Infrequently found. Local to dry, sparsely vegetated areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Berytinus montivagus*			Southern Widespread	Commonly found, Feeds on black medick. Associated with re-vegetating ground	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Berytinus signoreti*			Southern Widespead	It is probably associated with bird's-foot trefoil, and occurs in grassland on sandy and chalky soils. Distributed throughout lowland Britain.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Cymus melanocephalus*			Southern Widespread	Commonly found on rushes, Juncus	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Berytinidae (Stiltbugs)	*Gampsocoris punctipes*			Southern widespread	Commonly found Rest harrow	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Cimicidae (Flowerbugs)	*Anthocoris nemorum*			Universal	Commonly found. It occurs on trees and shrubs and eats small insects such as aphids and other plant bugs.	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Bathysolen nubilus*	Nationally Scarce		Southern Restricted	Infrequently found. Local. Associated with Medicago species on re-vegetating ground.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Ceraleptus lividus*			Southern Restricted	Frequently found.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Coreus marginatus*			Southern Widespread	Commonly found. On Rumex and Polygonum	0	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	0	1	1	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Coriomeris denticulatus*			Southern widespread	Frequently found. Feeds on legumes.	0	1	1	0	0	0	1	0	0	1	0	1	0	1	1	1	1	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Gonocerus acuteangulatus*	RDB 1		Southern Restricted	Infrequently found. For many years it was restricted to a single site in Surrey, but has recently spread throughout the south-east. Originally associated with box, it now occurs on hawthorn, rose, honeysuckle and buckthorn, feeding on the fruits.	0	1	1	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Coreidae (Squashbugs)	*Syromastes rhombeus*			Southern Restricted	Locally infrequently found.Associated with spurreys, sand-worts and other Caryophyllaceae.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Cydnidae	*Sehirus luctuosus*			Southern Widespread	Infrequently found. Feeds on Forget-me-not Myosotis species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Cydnidae (Shieldbugs)	*Tritomegas sexmaculatus*			Southern Restricted	Infrequently found. First recorded in UK 2011. Associated with Black Horehound.	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Chilacis typhae*			Southern Widespread	Commonly found. On flower heads of Typha species	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Drymus sylvaticus*			Universal	Very commonly found. In litter at the base of herbaceous vegetation where it feeds on mosses	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Eremocoris podagricus*			Southern Restricted	Frequently found. Associated with bare areas on chalky and sandy ground.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Heterogaster urticae*			Southern Widespread	Commonly found on nettles	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Ischnodemus sabuleti*			Southern Restricted	Commonly found. Usually in wetland habitats. Reed Beds.	1	1	1	0	0	0	1	1	0	1	0	0	1	0	1	1	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Kleidocerys resedae*			Universal	Commonly found on a variety of trees and bushes	0	1	1	1	0	1	1	0	0	0	1	1	0	1	0	1	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Megalonotus antennatus*			Universal	Frequently found. Associated with dry, open grassy areas.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Megalonotus emarginatus*			Southern Restricted	Locally frequently found.First reported in England in 1993. Found in sheltered grassland sites on well drained, often sandy, soils with short sparse vegetation.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Nysius huttoni*			Southern Widespread	Frequently found. A recent arrival from New Zealand. A major crop pest on cereals.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Nysius senecionis*			Southern Widespread	Locally frequently found, on ragwort and Common Fleabane. Recent colonist.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Peritrechus geniculatus*			Southern Widespread	Commonly found, in dry grassland habitats	0	1	1	0	0	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Scolopostethus affinis*			Universal	Commonly found. It lives on the ground, amongst leaf litter and frequently below nettles.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Stygnocoris sabulosus*			Universal	Commonly found on the ground, often at the roots of heather. Little is known about its development.	0	0	0	0	0	0	1	0	0	1	1	0	1	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Taphropeltus contractus*			Universal	Commonly found. sparsely-vegetated, dry soils amongst leaf litter.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Lygaeidae (Groundbugs)	*Trapezonotus desertus*			Southern Widespread	Commonly found. It occurs on dry open areas such as heathland and downland.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Acetropis gimmerthalii*			Southern Restricted	Commonly found, associated with grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Adelphocoris lineolatus*			Universal	Commonly found. The larval food plants are all Fabaceae, although the adults may be on Asteraceae.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Amblytylus nasutus*			Southern Restricted	Commonly found, associated with grasses	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Apolygus lucorum*			Universal	Comonly found. It occurs in a variety of habitats and is found on herbs such as nettle, mugwort, hemp-agrimony	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Apolygus spinolae*			Universal	Commonly found. On various herbaceous and scrubby plants	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Blepharidopterus diaphanus*			Universal	Commonly found, on foliage of willows	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Campyloneura virgula*			Universal	Commonly found. in hedgerows and thickets	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Capsus ater*			Universal	Commonly found, associated with grasses	0	0	1	0	0	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Charagochilus gyllenhalii*			Universal	Locally frequently found, on bedstraws Gallium species	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Closterotomus norwegicus*			Universal	Commonly found on a variety of plants	0	1	1	0	0	0	1	0	0	1	1	1	0	1	0	1	0	1	1	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Deraeocoris flavilinea*			Southern Restricted	Infrequently found. Only very recently recorded from Britain, this recent immigrant from European mainland has already been found in several English counties. It is likely that it will continue to spread and no conservation status is likely to be applied. Most records are for specimens beaten off the foliage of Sycamore Acer pseudoplatanus infested with aphids. The species is probably partially predatory.	0	0	0	0	1	1	0	1	0	1	0	1	0	0	0	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Deraeocoris lutescens*			Southern Widespread	Commonly found. On a variety of tree foliage	0	1	1	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Deraeocoris ruber*			Southern Widespread	Commonly found, associated with a variety of plants	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Dicyphus annulatus*			Universal	Commonly found. Rest harrow	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Dicyphus epilobii*			Universal	Commonly found. Associated with Epilobium hirsutum	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Dryophilocoris flavoquadrimaculatus*			Universal	Commonly found. Associated with oak.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Europiella artemisiae*			Southern Widespread	Commonly found. Associated with Artemesia.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Harpocera thoracica*			Universal	Commonly found. On oak Quercus species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Heterocordylus tibialis*			Universal	Locally commonly found. It occurs on broom, but both adults and larvae are partly predacious.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Heterotoma planicornis*			Universal	Commonly found on a variety of plant species	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Hoplomachus thunbergii*			Southern Restricted	Locally frequently found. Associated with Mouse-ear Hawkweed.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Leptopterna dolabrata*			Universal	Commonly found. Associated with grasses	0	0	0	0	0	1	1	0	0	1	0	1	0	1	1	1	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Leptopterna ferrugata*			Universal	Commonly found. Associated with grasses	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Liocoris tripustulatus*			Universal	Commonly found, on Stinging Nettle Urtica dioica	0	1	0	0	0	1	0	1	0	1	0	0	1	1	1	1	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Lopus decolor*			Southern Widespread	Commonly found. Local, on grasses, often on dry heaths	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Lygocoris pabulinus*			Universal	Commonly found. Feeds on a wide variety of herbaceous and woody plant species.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Lygus maritimus*			Southern widespread	Frequently found. It occurs in a range of open habitats on a variety of host-plants including mayweed, fat hen and sorrel.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Lygus pratensis*	RDB 3		Southern Restricted	Infrequently found, There has been much taxonomic confusion in the past and many old records are unreliable. Found in a variety of habitats including woodland rides and grassland. Biology and ecology are uncertain. Increasing recently.	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Lygus rugulipennis*			Universal	Commonly found on a variety of herbaceous plants	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Macrotylus horvathi*			Southern Restricted	Infrequently found. Associated with Ballota nigra. Recently found in Britain, currently known from Kent only.	0	1	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Macrotylus paykulli*			Southern widespread	Commonly found, Rest Harrow	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Megaloceraea recticornis*			Universal	Commonly found. Associated with grasses in humid situations.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Megaloceroea recticornis*			Southern Widespread	Commonly found, associated with grasses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Megalocoleus tanaceti*			Universal	Frequently found. associated with Tansy, feeding on the sap of the leaves, shoots and buds.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Neolygus viridis*			Universal	Commonly found. Feeds on a variety of woody plant species, including Oak, Alder Buckthorn and Lime.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Notostira elongata*			Southern Widespread	Commonly found, associated with grasses	0	1	1	1	0	0	1	1	1	1	0	0	1	0	0	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Oncotylus viridiflavus*			Southern Restricted	Locally commonly found, on Hardheads Centaurea nigra	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthocephalus saltator*			Universal	Commonly found on a variety of herbaceous plants	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthops campestris*			Universal	Commonly found, on several species of Apiaceae	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthops kalmii*			Universal	Commonly found. On several species of Apiaceae, the eggs are laid in the flower-head.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthotylus flavosparsus*			Universal	Frequently found. On Chenopodaceae, especially Fat Hen, goosefoots and oraches. Most frequent in coastal habitats.	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthotylus marginalis*			Universal	Commonly found on species of willows Salix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Orthotylus moncreaffi*			Southern Widespread	Coastal habitats, on Chenopodaceae, especially Sea Purslane.	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Phytocoris tiliae*			Universal	Comonly found. On a variety of tree species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Phytocoris ulmi*			Universal	Commonly found, on grasses	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Phytocoris varipes*			Southern Widespread	Commonly found associated with grasses	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Pilophorus clavatus*			Southern Widespread	Commonly found. On species of willows Salix	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Pilophorus perplexus*			Southern Restricted	Locally frequently found. Feeds on aphids on deciduous trees.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Pinalitus cervinus*			Universal	Commonly found. The adults and young suck the sap of trees through the foliage.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Pithanus maerkelii*			Universal	Commonly found, associated with grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Plagiognathus arbustorum*			Universal	Commonly found. On a variety of herbaceous plants	0	0	0	0	0	1	1	1	0	1	0	1	1	1	0	1	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Plagiognathus chrysanthemi*			Universal	Commonly found. On a variety of herbaceous plants	0	1	1	0	0	0	1	1	1	0	0	1	0	1	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Rhabdomiris striatellus*			Universal	Commonly found, on oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Stenodema calcarata*			Universal	Commonly found. Associated with grasses	0	1	1	1	0	0	1	1	1	1	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Stenodema laevigata*			Universal	Commonly found associated with grasses	0	0	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Stenodema trispinosa*			Southern Restricted	Infrequently found. Local in reed beds where it feeds on Common Reed.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Stenotus binotatus*			Southern Widespread	Commonly found. Associated with grasses.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Teratocoris antennatus*			Universal	Commonly found, often coastal. Feds on rushes, especially Sea Club-rush, but also utilises glaucous bulrush, mudrush and flote grass..	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Miridae (Capsid Bugs)	*Trigonotylus ruficornis*			Universal	Commonly found associated with grasses	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Himacerus apterus*			Southern Widespread	Commonly found. It is predacious on small insects and mites living on trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Himacerus major*			Universal	Commonly found in grassland habitats	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Himacerus mirmicoides*			Southern Widespread	Commonly found. In grassland habitats	0	1	0	0	0	1	1	0	0	1	0	1	0	1	1	0	0	0	0	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Nabis ferus*			Southern Widespread	Commonly found. Associated with grasslands.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Nabis flavomarginatus*			Universal	Commonly found. It lives amongst grasses, especially where they grow in damp areas or become tussocky. Widely distributed throughout the British Isles.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Nabis limbatus*			Universal	Commonly found, in grassland habitats	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Nabis lineatus*			Southern Restricted	Frequently found. Local, in marshes and reed-beds.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Nabidae (Damselbugs)	*Nabis rugosus*			Universal	Commonly found in grassland habitats	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Aelia acuminata*			Southern Restricted	Commonly found, associated with grasses	0	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Dolycoris baccarum*			Universal	Commonly found. On a variety of herbaceous plants.	0	1	1	0	1	1	1	0	0	0	0	1	0	1	1	0	0	1	0	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Eurydema oleracea*			Southern Restricted	Infrequently found. It feeds on the leaves of various crucifers, especially horse-radish and garlic mustard. Perhaps increased in recent years.	0	1	1	0	0	0	1	1	0	1	0	1	1	1	1	1	1	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Eysarcoris venustissimus*			Southern Restricted	Commonly found. On Labiatae, especially Stachys sylvatica	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Legnotus limbosus*			Southern Widespread	Commonly found. Associated with bedstraws, especially goose grass and lady's bedstraw.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Neottiglossa pusilla*			Southern Restricted	Infrequently found. Local, associated with grasses	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Palomena prasina*			Universal	Commonly found on a variety of herbaceous plants	0	1	0	1	0	0	1	1	0	1	1	1	1	1	1	1	0	0	1	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Pentatoma rufipes*			Universal	Commonly found It occurs on a variety of deciduous trees, the adults feeding, at least partially, on other insects.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Picromerus bidens*			Universal	Commonly found, on a variety of plants, often on heather	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Piezodorus lituratus*			Universal	Gorse Sheildbug. Commonly found, on gorse Ulex and Broom Cytisus scoparius	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Podops inuncta*			Southern Widespread	Frequently found. in dry grassland habitats.	0	1	0	1	0	0	1	0	0	0	0	1	1	1	1	0	1	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Pentatomidae (Sheildbugs)	*Sciocoris cursitans*			Southern Restricted	Frequently fund, but local. On dry sandy or chalky soils. Associated with low-growing plants such as Potenitilla and Pilosella.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Piesmatidae	*Parapiesma quadratum*			Universal	Coastal, associated with Atriplex	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Chorosoma schillingi*			Southern Restricted	Commonly found. They feed on various grasses in dry, sandy places	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Corizus hyoscyamii*			Southern Widespread	Commonly found, but local. Rest Harrow.	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Liorhyssus hyalinus*			Southern Restricted	The status of this bug in Britain is uncertain. A thin scattering of records over a wide area have led to the belief that it is an occasional vagrant. However, in recent years it appears to be spreading and may be establishing itself in southern England and South Wales.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Myrmus miriformis*			Southern Widespread	Frequently found. Local, in grassland habitats, often on heaths	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	1
120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Rhopalus subrufus*			Southern Restricted	Commonly found. Often on St John's-wort Hypericum	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	1	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Rhopalidae	*Stictopleurus punctatonervosus*			Southern Restricted	Frequently found. Kirby (1992) states that there are confirmed British records from Surrey (Charlwood in 1860, 1869 & 1870) and Sussex (Holm Bush before 1870). It seem likely that this species is an occasional migrant that forms temporary colonies in southern Britain. It is very closely similar to S. abutilon, another presumed extinct British species that has recently become established in several parts of southern England. It is a relatively large and conspicuous bug that is unlikely to have escaped notice by entomologists. Kirby (1992) states that in north-western Europe it is a species of dry open habitats but nothing else is stated on the biology other than the fact that it overwinters as an adult and confirmed British specimens have been found in May and	0	0	0	0	0	1	1	0	0	1	0	1	1	0	1	0	1	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Saldidae	*Saldula saltatoria*			Universal	Commonly found. Occurs around the margins of ponds, ditches and slow-flowing streams, feeding on other insects.	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Scutelleridae (Shieldbugs)	*Eurygaster maura*			Southern Restricted	Infrequently found. Asociated with grasses and possibly other herbaceous plants.	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Scutelleridae (Shieldbugs)	*Eurygaster testudinaria*			Southern Restricted	Frequently found. Local, associated with grasses	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Tingidae (Lacebugs)	*Acalypta parvula*			Universal	Frequently found.	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Tingidae (Lacebugs)	*Kalama tricornis*			Southern Widespread	Locally frequently found. On dry, often sparsely vegetated soils	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0

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120 HEMIPTERA-HETEROPTERA (Bugs)	Tingidae (Lacebugs)	*Physatocheila dumetorum*			Southern Widespread	Frequently found. Associated with lichens on trees	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Tingidae (Lacebugs)	*Tingis ampliata*			Southern Widespread	Commonly found on Creeping Thistle Cirsium arvense	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	1	0	1	1	0
120 HEMIPTERA-HETEROPTERA (Bugs)	Tingidae (Lacebugs)	*Tingis cardui*			Universal	Commonly found. Associated with Spear Thistle.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Aphidae	*Eriosoma lanuginosum*			Southern Widespread	Frequently found. Forms galls on Elm.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Aphidae	*Pemphigus bursarius*			Southern Restricted	Frequently found. Forms galls on Poplars.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Aphidae	*Pemphigus spyrothecae*			Southern Restricted	Frequently found. Forms galls on Poplars.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cercopidae (Froghoppers)	*Cercopis vulnerata*			Southern Widespread	Commonly found. In grassland and woodland edge habitats	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cercopidae (Froghoppers)	*Neophilaenus campestris*			Southern Widespread	Locally frequently found. Associated with calcareous grassland.	0	1	1	1	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cercopidae (Froghoppers)	*Neophilaenus exclamationis*			Universal	Locally commonly found in short grasses.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cercopidae (Froghoppers)	*Neophilaenus lineatus*			Universal	Commonly found. On grasses	0	0	1	1	0	1	1	0	0	0	0	0	0	1	1	0	0	1	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cercopidae (Froghoppers)	*Philaenus spumarius*			Universal	Commonly found. On a variety of trees and herbaceous plants	1	1	1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Acericerus heydenii*			Southern Restricted	Infrequently found. Newly recognised as British. Associated with Sycamore Acer pseudoplatanus.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Anoscopus limicola*	Nationally Scarce		Southern Restricted	Frequently found. Local to coastal saltmarsh.	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Aphrodes aestuarinus*	Nationally Scarce b		Southern Restricted	Infrequently found. Saltmarshes between Dorset and Norfolk. Possibly associated with Shrubby Seablite Suaeda maritima.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Aphrodes aestuarius*	Nationally Scarce		Southern Widespread	Infrequently found. A coastal species (Lancashire to Lincolnshire) with an association with Shrubby Seablite Suaeda vera and possibly Annual Seablite Suaeda maritima. Associations with Saltmarsh Grass Pucinella maritima and Sea Purslane Atriplex portulacoides.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Aphrodes makarovi*			Universal	Commonly found, on grasses	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Aphrophora alni*			Universal	Commonly found, on a variety of trees and shrubs	0	1	1	1	0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	1
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Athysanus argentarius*			Southern Restricted	Frequently found, but local. Associated with saltmasrsh	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Conosanus obsoletus*			Universal	Commonly found. On grasses in damp places	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Empoasca vitis*			Universal	Common, on trees and shrubs	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Eupelix cuspidata*			Universal	Commonly found	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Eupteryx aurata*			Universal	Commonly found. Feeds on a wide variety of tall herbaceous plants.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Eupteryx florida*			Universal	Commonly found. Associated with Lamiacae	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Eupteryx vittata*			Universal	Comonly found. On a wide range of plant species in open, but damp, habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Eurhadina loewii*			Southern Restricted	Commonly found. On Sycamore	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Iassus lanio*			Universal	Commonly found on oak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Idiocerus confusus*			Universal	Commonly found. Associated with Salix cinerea and S. caprea.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Idiocerus herrichi*			Southern Restricted	Frequently found, but local. Associated with White Willow Salix alba	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Idiocerus lituratus*			Universal	Commonly found. A fairly large, grey-brown leaf-hopper. It occurs on various species of sallow and willow, feeding on the sap.	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Idiocerus stigmaticalis*			Universal	Commonly found. On Salix species, especially S. alba and S. fragilis.	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Kybos betulicola*			Universal	Commonly found, on birch	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Ledra aurita*			Southern Restricted	Locally frequently found. In woodland, especially on oak	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Linnavuoriana sexmaculata*			Universal	Commonly found. On sallows	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Macropsis infuscata*			Southern Widespread	Commonly found. On Goat Wilow.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Macropsis infuscata*			Southern Widespread	Commonly found. On Goat Willow.																				
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Macustus grisescens*			Universal	Commonly found on grasses	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Megophthalmus scanicus*			Universal	Commonly found	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Oncopsis flavicollis*			Universal	Commonly found, on birch	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Opsius stactogalus*			Southern Restricted	Commonly found. A medium-sized bright green leaf-hopper. It feeds on tamarisk. A local species occurring along the south coast and sporadically inland on cultivated varieties of tamarisk.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Ossiannilssonola callosa*			Universal	Commonly found. On sycamore	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Paralimnus phragmitis*	Nationally Scarce		Southern Restricted	Frequently found. In reed beds, especially in eastern England. Associated with Common Reed.	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Paramesus obtusifrons*			Southern Widespread	Locally frequently found. Associated with coastal marshes. On Bolboschoenus maritimus and, possibly, Phragmites communis	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Populicerus albicans*			Southern Restricted	Frequently found. On poplars	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0

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130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Populicerus confusus*			Universal	Commonly found. On sallows.	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Tremulicerus fulgidus*	Nationally Scarce a		Southern Restricted	Frequently found. Associated with Lombardy Poplar	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Tremulicerus tremulae*			Southern Widespread	Locally frequently found. On Aspen Populus tremula and White Poplar Populus alba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Tremulicerus vitreus*			Southern Restricted	Frequently found. On poplars and sallows	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Viridicerus ustulatus*			Southern Restricted	Frequently found. A recent colonist in Britain and spreading. Associated with White Poplar Poplulus alba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cicadellidae (Leafhoppers)	*Zygina nivea*			Southern Restricted	Infrequently found. On White Poplar. New to Britain in 2010.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cixiidae (Planthoppers)	*Cixius nervosus*			Universal	Commonly found. Especially in woods	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cixiidae (Planthoppers)	*Cixius pilosus*			Universal	Commonly found. Dry grassland.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Cixiidae (Planthoppers)	*Oliarus panzeri*	Nationally Scarce		Southern Restricted	Locally Infrequently found. The ecology is poorly understood but it may prefer areas that are periodically waterlogged but which dry out and crack in summer. The foodplants are unknown but the nymphs are thought to be root feeders.	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Asiraca clavicornis*			Southern Restricted	Locally Frequently found. On grasses. Apparently much declined but still frequent in the London district.	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	1	1	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Chloriona glaucescens*			Universal	Commonly found on reeds.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Chloriona unicolor*			Southern Restricted	Frequently found on reeds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Delphax pulchellus*			Southern Widespread	Commonly found on reeds.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Dicranotropis hamata*			Universal	Commonly found. associated with grassland	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Ditropis pteridis*			Southern Widespread	Commonly found, on Bracken	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Eurybregma nigrolineata*	Nationally Scarce b		Southern Restricted	Frequently found. On grasses in marshes.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Eurybregma nigrolineata*			Southern Restricted	Frequently found. On grasses in marshland.																				
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Javesella pellucida*			Universal	Commonly found. A fairly small, brownish-black plant-hopper. It occurs on grasses in a variety of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Megamelus notula*			Universal	Commonly found. Damp grasslands. Associated with sedges	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Stenocranus minutus*			Southern Widespread	It occurs on grass in woods and meadows. Common in the southern half of Britain.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Delphacidae (Planthoppers)	*Xanthodelphax stramineus*			Southern Restricted	Frequently found. On grasses in dry areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Issidae (Planthoppers)	*Issus coleoptratus*			Southern Widespread	Frequently Found. Associated with ivy Hedera helix	0	1	1	0	0	1	1	0	0	1	1	1	0	1	1	0	0	0	0	0
130 HEMIPTERA-HOMOPTERA (Bugs)	Membracidae (Planthoppers)	*Centrotus cornutus*			Universal	Frequently found, but local, feed on sap of oak.	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	1	0	0	1	1
130 HEMIPTERA-HOMOPTERA (Bugs)	Triozidae	*Trioza centranthi*			Southern Restricted	Frequently found. Forms galls on Red Valarian.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Adelidae	*Adela cuprella*			Universal	Local It is associated with sallow, the eggs being laid in the catkins although the larvae feed amongst leaf litter on the ground.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Adelidae	*Adela reaumurella*			Southern Widespread	Commonly found. The larvae feed on leaf litter.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Adelidae	*Cauchas rufimitrella*			Universal	Commonly found. The larvae feed on Brassicaceae.	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Eilema complana*			Southern Widespread	Local The larvae feed on lichens growing on branches and walls.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Eilema depressa*			Southern widespread	Buff Footman. Locally frequently found. Larvae feed on lichens in woodland.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Eilema griseola*			Southern Widespread	Frequently found. The larvae feed on lichens growing on bark, usually in damp areas.	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Euplagia quadripunctaria*	Nationally Scarce		Southern Restricted	Jersey Tiger Moth. Infrequently found. The larva feeds on the leaves of a range of herbs.	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Miltochrista miniata*			Southern Widespread	Common The larva feeds on lichens growing on old trees.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Phragmatobia fuliginosa*			Universal	Ruby Tiger Moth. Commonly found. The hairy larvae feed on a variety of low plants.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Arctiidae (Tiger Moths)	*Tyria jacobaeae*	Section 41 species	S41	Universal	The Cinnabar moth. Commonly found. Larvae feed on Ragwort.	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
140 LEPIDOPTERA (Butterflies and Moths)	Blastobasidae	*Blastobasis adustella*			Universal	Commonly found. The larva feeds on decaying and dead vegetable matter.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Bucculatricidae	*Bucculatrix bechsteinella*			Universal	Commonly found. The larvae feed internally and externally on the leaves of hawthorn.	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Choruetidae	*Anthophila fabriciana*			Southern Widespread	Nettle Tap. Commonly found. Feeds on the leaves of Stinging Nettle.	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora alcyonipennella*			Southern Widespread	The larva lives in a case and feeds on the seeds of white clover. Recently separated from *C. frischella*, the two formerly thought to be synonymous, and so the distribution imperfectly known.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora amethystinella*	pRDB1		Southern Restricted	Locally frequently found. The larva feeds on seeds of Smooth Tare and lives in a case. Discovered in UK in 1973.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora asteris*			Southern Restricted	Locally frequently found. The larva feeds on Sea Aster. It lives in a case.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora badiipennella*			Southern Restricted	Locally frequently found. The larva feeds on Elm and lives in a case made from a section of mined leaf reinforced with silk.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora deauratella*			Southern Restricted	Locally frequently found. The larvae develop on red clover, feeding on the unripe seeds.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora hemerobiella*			Southern Restricted	Locally frequently found. The larva lives in a case and feeds on rosaceous trees, most frequently hawthorn.	0	1	1	0	1	1	1	0	0	1	0	0	0	1	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora limosipennella*			Southern Restricted	Locally frequently found. The larva feeds on Elm and lives in a case made from a section of mined leaf reinforced with silk.	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora lineolea*			Southern Widespread	Frequently found. Larvae feed in dry grasslands on Lamiaceae such as Black Horehound.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora lusciniaepennella*			Universal	Common The larva lives in a case made of silk and leaf-material and feeds on sallows and willows.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora mayrella*			Universal	Commonly found. The larva feeds on white clover, eating the ripening seeds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora serratella*			Universal	Commonly found. The larva lives in a case, feeding on the leaves of birch, hazel, alder or elm.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora spinella*			Southern Widespread	Frequently found. The larva lives in a case formed from silk and leaf fragments and feeds on various rosaceous trees, most frequently hawthorn.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Coleophoridae (Case Moths)	*Coleophora trifolii*			Southern Restricted	Locally frequently found. The larva feeds on seeds of Melilot and lives in a case.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Agriphila geniculea*			Universal	Commonly found. The larva feeds on various grasses. Widespread in dry pasture and coastal sandhills throughout Britain.	0	1	1	1	0	1	1	0	0	1	0	0	1	1	1	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Agriphila straminella*			Universal	Commonly found. The larvae feed on grasses.	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Agriphila tristella*			Universal	Commonly found, in grasslands.	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Calamotropha paludella*	Nationally Scarce b		Southern Restricted	Frequently found. The larva mine the leaves and stems of Bulrush (Typha angustifloia).	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Cataclysta lemnata*			Southern Widespread	Frequently found. The larva feed in floating cases on Duckweeds.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Chrysoteuchia culmella*			Universal	Commonly found. The larva feeds internally in the bases of various grasses. Often abundant in open, grassy areas.	0	1	1	0	0	1	1	0	1	1	0	0	0	0	1	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Crambus lathoniellus*			Universal	Commonly found. The larvae feed on the stems of various grasses.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Oncocera semirubella*	Nationally Scarce b		Southern Restricted	Locally commonly found. The larva feeds on common bird's-foot trefoil and white clover.	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Pleuroptya ruralis*			Universal	Commonly found. The larva feeds on nettle, living in a rolled leaf.	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Pyrausta aurata*			Universal	Locally frequently found. The larvae feed on Labaites.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Pyrausta despicata*			Universal	Locally frequently found. The larvae feed, gregariously, at the roots of plantain. A species of dry, open areas, such as downland, cliffs and sandhills.	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Crambidae	*Schoenobius gigantella*	Nationally Scarce b		Southern Restricted	Frequently found. The larva mine the leaves and stems of Common Reed	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Douglasiidae	*Tinagma ocnerostomella*			Southern Restricted	It occurs in dry, open areas where its larval foodplant viper's bugloss grows. The eggs are laid on the flowers and the larvae develop within a stem feeding on the pith. A local species, restricted to southern and eastern England.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Elachistidae	*Elachista argentella*			Universal	Commonly found. The larva mines the leaf of a number of species of grass.	0	0	1	0	0	0	1	0	0	0	0	1	0	1	0	1	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Elachistidae	*Elachista canapennella*			Universal	Common The larvae are leaf-miners in various species of grass. It occurs commonly in a wide range of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Elachistidae	*Elachista rufocinerea*			Universal	Commonly found. The larvae fed on various grasses, mining the leaf-blade.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Elachistidae	*Elachista stabilella*	pRDB3		Southern Restricted	Infrequently found. The larvae mine the leaves various species of grasses.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Epermeniidae	*Epermenia chaerophyllella*			Universal	Commonly found. The larvae feed, semi-gregariously, on the underside of leaves of hogweed and angelica causing brown patches.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Eriocraniidae	*Dyseriocrania subpurpurella*			Universal	Commonly found. The larvae mine the leaves of oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Apodia bifractella*			Southern Widespread	Frequently fond, but local. The larvae feed on the seeds of fleabane and ploughman's spikenard, and the moth can occur in damp meadows and on downland	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Aproaerema anthyllidella*			Southern Widespread	Locally commonly found. The larvae feed on the leaves, flowers and seeds of kidney vetch, rest-harrow and clover, much preferring the former.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Helcystogramma rufescens*	Nationally Scarce		Southern Restricted	Frequently found. The larvae feed on the leaves of various grasses.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Scrobipalpa acuminatella*			Universal	Frequently found. The larvae mine the leaves of various thistles.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Scrobipalpa costella*			Universal	Frequently found. The larvae mine the leaves of Woody Nightshade.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gelechiidae	*Syncopacma cinctella*	Nationally Scarce		Southern Restricted	Frequently found. The larvae feed on the leaves of Bird's-foot Trefoils.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Aplocera plagiata*			Universal	The Treble-bar moth. Locally commonly found. The larva feeds on various species of St John's-wort.	0	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Biston betularia*			Universal	Peppered Moth. Commonly found. The larva feeds on the leaves of a variety of trees and shrubs.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Cabera exanthemata*			Universal	Common The larva feeds on sallow.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Camptogramma bilineata*			Universal	Yellow Shell Moth. Commonly found. Caterpillar feeds on a variety of low-growing plants.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Chiasmia clathrata*		S41	Universal	Latticed Heath. Commonly found, possibly also a migrant. The larva feeds on a variety of legumes.	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Colotois pennaria*			Universal	Feathered Thorn moth. Commonly found. The larvae feed on a variety of deciduous trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Eupithecia centaureata*			Universal	Commonly found. The larvae feed on the flowers of various herbaceous plants.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Eupithecia haworthiata*			Universal	Haworth's Pug. Commonly found. The larva feeds in the buds of Traveller's Joy.	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Gymnoscelis rufifasciata*			Universal	Double-striped Pug. Commonly found. The larva feeds on the flowers of a number of wild and garden plants. Commonly found. The larva feeds on the flowers of a number of wild and garden plants.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Hypomecis punctinalis*			Southern Widespread	Pale Oak Beauty moth. Locally Frequently found. The larvae fed on the leaves of a variety of trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Idaea dimidiata*			Universal	Single-dotted Wave. Commonly found. Associated with a variety of herbaceous plants.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Lomaspilis marginata*			Universal	The larvae feed on sallow and aspen.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Operophtera brumata*			Universal	Winter moth. Commonly found. The larva feeds on a very wide range of deciduous trees and shrubs.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Petrophora chlorosata*			Universal	Brown Silver-line moth. Commonly found. The larva feeds on bracken and the adult is frequently seen by day.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Scopula imitaria*			Southern Widespread	The Small Blood-vein moth. Comonly found. A wide range of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

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140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Scotopteryx bipunctaria*	Nationally Scarce b	S41	Southern Restricted	The Chalk Carpet moth. Frequently found. The larva feeds on common bird's-foot trefoil, other trefolis, vetches and clovers. A species of calcareous sites, preferring those with rocks or bare ground.	0	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Scotopteryx chenopodiata*	A UK BAP species	S41	Universal	Shaded Broad-bar moth. Frequently found. The larva feeds on species of vetch and clover.	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Geometridae (Looper Moths)	*Semiaspilates ochrearia*			Southern Widespread	Locally commonly found. It occurs in open habitats such as dunes, shingle beaches, salt-marsh and other grassy places, the larva feeding on herbaceous plants such as wild carrot and plantain. Coastal counties in the southern half of Britain.	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Glyphipterigidae	*Glyphipterix simpliciella*			Universal	Commonly found. The larvae mine the stems of grass.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Aspilapteryx tringipennella*			Universal	Locally commonly found. The larva feeds on ribwort plantain, living in a blotch mines over the mid-rib.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Callisto denticulella*			Southern Widespread	Commonly found. The larva feeds on apple, initially mining the leaf, later in a folded leaf-edge.	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Caloptilia rufipennella*			Southern Widespread	Commonly found. The larva feeds on sycamore at first in a mine, later in a cone at the tip of a leaf.	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Caloptilia semifascia*			Southern Widespread	Commonly found. The larva feeds on field maple at first in a mine, later in a fold at the tip of a leaf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Caloptilia stigmatella*			Universal	Commonly found. The larva feeds on willows and poplars, at first in a mine, later in a cone at the tip of a leaf.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Leucospilapteryx omissella*			Southern Restricted	Frequently found. The larva mines the leaves of Mugwort	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Parornix anglicella*			Universal	Commonly found. The larva feeds on hawthorn, at first in a mine then later in a folded leaf.	0	0	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Parornix devoniella*			Universal	Commonly found. The larva feeds on hazel, at first in a mine then later in a folded leaf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllocnistis unipunctella*			Southern Widespread	Commonly found. The larvae mine the leaves of poplar.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter acerifoliella*			Southern Widespread	Locally commonly found. The larva mines within the leaves of Field Maple.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter cerasicolella*			Southern Widespread	Commonly found. The larvae feed on Cherries, mining the leaves.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter comparella*			Southern Restricted	Commonly found. The larvae mine the leaves of grey poplar.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter corylifoliella*			Universal	Commonly found. The larva mines within the leaves of a number of different rosaceous trees.	0	1	0	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter geniculella*			Universal	Commonly found. The larva mines a leaf of sycamore.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter klemannella*			Universal	Commonly found. The larvae mine the leaves of alder.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter lantanella*			Southern Widespread	Locally commonly found. The larva mines within the leaves of Wayfaring Tree.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter leucographella*			Southern Widespread	Commonly found. A recent arrival in the UK. Mostly associated with Rosaceoous shrubs, but not entirely so.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter messaniella*			Universal	Commonly found. The larva lives within a leaf, forming a blotch mine and feeding on oak, including evergreen varieties, sweet chestnut and beech.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter oxyacanthae*			Universal	Commonly found. The larva mines within the leaves of hawthorn.	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter quercifoliella*			Universal	Commonly found. The larva lives within an oak leaf, forming a blotch mine.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter stettinensis*			Southern Widespread	Local The larva mines a leaf of alder, the mine being situated on the upper surface.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Gracillariidae	*Phyllonorycter ulmifoliella*			Universal	Commonly found. The larva mines within the leaves of birch.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Heliozelidae	*Antispila metallella*			Southern Widespread	Commonly found. The larva mines a leaf of dogwood, eventually cutting a case in which it falls to the ground.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Hepalidae	*Korscheltellus lupulinus*			Universal	Commonly found. larvae feed in the roots of grasses.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Hepalidae	*Triodia sylvina*			Universal	Commonly found. The larvae mine the roots of herbaceous plants	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Hesperiidae (Skipper Butterflies)	*Ochlodes sylvanus*			Southern Widespread	Large Skipper butterfly. Commonly found. The larvae feed on taller grasses.	0	1	0	1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Hesperiidae (Skipper Butterflies)	*Thymelicus lineola*			Southern Restricted	Essex Skipper butterfly. Commonly found. The larva feeds on various grasses, particularly cock's-foot and creeping soft-grass. More or less restricted to southern and eastern England, but apparently spreading.	0	1	1	0	0	0	1	1	1	1	1	0	1	1	0	1	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Hesperiidae (Skipper Butterflies)	*Thymelicus sylvestris*			Southern Widespread	Small Skipper butterfly. Commonly found. The larva feeds on grasses, especially Holcus spp.	0	1	1	1	0	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Incurvariidae	*Incurvaria masculella*			Universal	Common The larva feeds on hawthorn, initially mining the leaves, later feeding from a case.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Incurvariidae	*Nematopogon schwarziellus*			Universal	Commonly found. A woodland species. The larva feeds in a case on the ground.	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Incurvariidae	*Nemophora degeerella*			Southern Widespread	Commonly found. It occurs in damp woodland, usually with bluebells. The larvae feed in leaf litter.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lasiocampidae	*Lasiocampa quercus*			Universal	Common The hairy larvae feed on heather, birch and bramble. A common species on heathland, and grassland, especially along the coast.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Lasiocampidae	*Malacosoma neustria*	A UK BAP species	S41	Universal	The Lackey Moth. Frequently found. The hairy larvae are initially gregarious and feed on many deciduous trees and shrubs.	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Lycaenidae (Blue Butterflies)	*Aricia agestis*			Southern Widespread	Brown Argus butterfly. Frequently found but local. A species associated with calcareous grassland, where the caterpillars feed on rockrose, or heathland/ heathy woodland, where they feed on cranesbill and storksbill. The larvae are attended by ants.	0	1	0	0	0	1	0	0	0	1	0	1	1	1	1	0	0	1	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Lycaenidae (Blue Butterflies)	*Callophrys rubi*			Universal	Green Hairstreak butterfly. Locally frequently found. The larva feeds on a variety of plants such as rock-rose, gorse, dogwood, heather and bilberry, depending on habitat.	0	0	1	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lycaenidae (Blue Butterflies)	*Celastrina argiolus*			Southern Widespread	Holly Blue butterfly. Commonly found. There are two generations a year, larvae of the first feeding principally on the flowers of holly and of the second on buds of ivy.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lycaenidae (Blue Butterflies)	*Lycaena phlaeas*			Universal	Small Copper butterfly. Locally frequently found The larva feeds on various species of sorrel growing in open situations.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Lycaenidae (Blue Butterflies)	*Polyommatus icarus*			Universal	Common Blue butterfly. Commonly found. The larva feeds on various legumes, especially bird's-foot trefoil.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lymantriidae (Tussock Moths)	*Euproctis chrysorrhoea*			Southern Widespread	The Brown-tail Moth. Locally very common. The larvae make large feeding webs on trees and shrubs. Infamous because the hairs of the caterpillars cause severe irritation.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Lymantriidae (Tussock Moths)	*Orgyia antiqua*			Universal	Vapourer moth. Commonly found. The larvae feed on most deciduous trees and shrubs.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lyonetiidae	*Bedellia somnulentella*			Southern Restricted	Commonly found. The larvae mine the leaves of bindweeds.	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Lyonetiidae	*Leucoptera malifoliella*			Southern Widespread	Local The larva makes a blotch mine on the leaves of rosaceous trees, especially hawthorn, apple and pear.	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Lyonetiidae	*Lyonetia clerkella*			Universal	Commonly found. The larva mines the leaves of various rosaceous trees.	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Momphidae	*Mompha epilobiella*			Universal	Commonly found. The larvae feed in the spun terminal shoots of great willowherb.	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Momphidae	*Mompha propinquella*			Universal	Frequently found. The larva mines the leaves of willowherbs.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Momphidae	*Mompha subbistrigella*			Southern Widespread	Frequently found. The larva feeds on the seeds of willowherbs.	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Ectoedemia heringella*			Southern Restricted	Commonly found. The larva feeds on Holm Oak, mining the leaves.	0	1	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Ectoedemia spinosella*			Southern Restricted	Commonly found. The larva feeds on blackthorn, mining the leaves.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella aceris*			Southern Restricted	Infrequently found. The larvae mine within the leaves of field maple and Norway maple. Formerly known from only a couple of records, it has recently been found at a number of sites in Surrey.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella aurella*			Universal	Commonly found. The larvae mine within the leaves of bramble and other rosaceous plants.	0	1	0	1	1	0	0	0	0	1	0	1	1	1	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella basiguttella*			Southern Widespread	Locally commonly found. The larvae mine the leaves of oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella crataegella*			Southern Widespread	Commonly found. The larvae mine the leaves of hawthorn.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella hybnerella*			Universal	Commonly found. The larvae mine the leaves of hawthorn.	0	1	0	0	1	1	0	0	0	1	0	0	1	1	1	0	1	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella lapponica*			Universal	Commonly found. The larva mines the leaves of birch.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella lemniscella*			Universal	Locally commonly found. The larvae mine the leaves of elm.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella malella*			Southern Widespread	Locally frequently found. The larva mines the leaves of apple.	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella microtheriella*			Universal	Commonly found. The larva makes a mine in a leaf of hazel or hornbeam.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella obliquella*			Southern Widespread	Commonly found. The larvae mine the leaves of willows.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella perpygmaeella*			Universal	Locally commonly found. The larvae mine the leaves of hawthorn.	0	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella plagicolella*			Souhern Widespread	Commonly found. The larvae mine within the leaves of sloe, producing a round blotch.	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella sakhalinella*			Southern Restricted	Locally commonly found The larvae mine within the leaves of birch.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella salicis*			Universal	Commonly found. The larvae mine within the leaves of sallow.	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella speciosa*			Southern Restricted	Frequently found. The larvae mine within the leaves of sycamore. A fairly recent addition to the British list, occurring in southern England.	0	0	0	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella trimaculella*			Southern Widespread	Commonly found. The larvae mine the leaves of poplars.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella ulmivora*			Southern Widespread	The larvae mine within the leaves of elm. Common throughout much of England and Wales.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nepticulidae	*Stigmella viscerella*			Southern Restricted	Frequently found. The larvae mine the leaves of elm.	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Agrotis puta*			Southern Restricted	The Shuttle-shaped Dart moth. Commonly found. The larvae feed on a wide range of herbaceous plants.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Agrotis segetum*			Universal	Commonly found. The larvae live on or below the surface of the ground eating the roots and stems of a wide range of herbaceous plants. A common and widespread species, reinforced by immigration.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Archanara geminipuncta*			Southern Restricted	Twin-spot Wainscot. Frequently found, but local. Caterpillars feed inside Common Reed.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Autographa gamma*			Migrant	Silver Y moth. Migrant. Very commonly found. It flies readily by day and can be seen at dusk hovering over nectar sources.	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	0	0	0	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Callistege mi*			Universal	Mother Shipton moth. Commonly found. The larva feeds on coarse grasses.	0	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Calophasia lunula*			Southern Restricted	Frequently found, but local. Larva feeds on Toadflaxes.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Cosmia trapezina*			Southern Widespread	Common The larva feeds on a wide variety of trees and shrubs, also on other caterpillars.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Cucullia absinthii*	Nationally Scarce		Southern Restricted	The Wormwood. Frequently found, but local. Caterpillars feed on Wormwood and Mugwort.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Cucullia asteris*	Nationally Scarce		Southern Restricted	The Starwort. Frequently found, but local. Caterpillars feed on Sea Aster and Goldenrod.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Eremobia ochroleuca*			Southern Widespread	The Dusky Sallow.Commonly found. The larvae feed on grasses.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Euclidia glyphica*			Universal	Burnet Companion moth. Commonly found. The larvae feeds on trefoils and clovers.	0	0	1	0	0	1	1	0	0	0	0	1	0	1	1	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Heliothis peltigera*			Migrant	Bordered Straw. Commonly found. The larvae fed on the flowers of a variety of herbaceous plants. It is an immigrant unable to maintain populations in this country.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Hoplodrina ambigua*			Southern Restricted	Vine's Rustic. Commonly found. Larva feeds on a variety of low growing plants.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Mesoligia furuncula*			Universal	The larvae feed in the stems of various grasses. Found over much of Britain, especially common coastally.	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Mythimna albipuncta*			Southern Restricted	A regular migrant species which becomes temporarily established in Southern England.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Mythimna ferrago*			Universal	The Clay. Commonly found. The larva feeds on a variety of grasses.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Mythimna impura*			Universal	Smoky Wainscott. Commonly found. The larva feeds on a variety of grasses.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Mythimna straminea*			Southern Widespread	Southern Wainscott Commonly found. The larva feeds on Common Reed.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Noctua interjecta*			Universal	Least Yellow-underwing moth. Commonly found. Larvae feed on the foliage of a wide range of herbaceous and woody plants.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Nonagria typhae*			Universal	Bulrush Wainscot. Frequently found, but local. Caterpillars feed inside Bulrush (Typha latifolia).	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Orthosia cerasi*			Universal	Common Quaker moth. Commonly found. The larva feeds on trees such as oak, sallow and hazel.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Panemeria tenebrata*			Southern Widespread	Small Yellow Underwing moth. Frequently found. The larvae feed on the seeds of common mouse-ear.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Noctuidae (Cut-worm Moths)	*Shargacucullia verbasci*			Southern Widespread	Mullein moth. Commonly found, but local. Caterpillars feed on Mulleins and Figworts.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nolidae	*Nola cucullatella*			Southern Widespread	Commonly found. The larvae feed on Hawthorn and Sloe.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Notodontidae	*Cerura vinula*			Universal	Puss Moth. Commonly found. The larva feeds on poplars and willows.	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Aglais urticae*			Universal	Small Tortoishell. Commonly found. The larvae feed on common nettle, living communally.	0	1	0	0	0	0	1	1	0	1	1	1	0	0	1	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Aphantopus hyperantus*			Universal	Ringlet butterfly. Commonly found. The larva feeds on grass.	0	0	0	1	0	0	1	1	0	1	1	0	1	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Coenonympha pamphilus*	A UK BAP species	S41	Universal	Small Heath butterfly. Locally commonly found, declining. The larva feeds on various species of grass.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Inachis io*			Southern Widespread	Peacock butterfly. Commonly found. The larvae feed on common nettle, living communally.	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Lasiommata megera*	A UK BAP species	S41	Southern Widespread	Wall butterfly. Formerly a common species, it has become noticeably scarcer during the last ten years; this may reflect the loss of broken-structured grassland. The larvae feed on grasses which are growing at the edges of bare ground.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Maniola jurtina*			Universal	Meadow Brown butterfly. Commonly found. The larva feeds on many species of grass, preferring the finer varieties. It occurs in open grassy situations.	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Pararge aegeria*			Universal	Speckled Wood butterfly. Commonly found. Associated with shady woodlands, although it still requires patches of sunlight. The larva feeds on grasses, usually in sheltered situations such as woodland and scrub.	0	1	0	0	1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Polygonia c-album*			Southern Widespread	Comma butterfly. Commonly found. The larva feeds on the leaves of nettle, elm and hop.	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Pyronia tithonus*			Southern Widespread	Gatekeeper butterfly. Commonly found. The larva feeds on various grasses, narrow-bladed species being preferred.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Vanessa atalanta*			Migrant	Red Admiral butterfly. Commonly found. Migrant. The larva feeds on nettle. The adult is a migrant and can turn up almost anywhere.	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0	1	0	1	1	1

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140 LEPIDOPTERA (Butterflies and Moths)	Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)	*Vanessa cardui*			Migrant	Painted Lady butterfly. Commonly found. The larva feeds mainly on species of thistle. The adult is a migrant and cannot survive the British winter.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Ochsenheimeriidae	*Ochsenheimeria taurella*			Southern Widespread	Frequently found. The larvae feed on various species of grass, mining the lower stem.	0	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Agonopterix alstromeriana*			Universal	Commonly found. Larvae feed on leaves and sometimes flowers of Hemlock in a wide variety of locations.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Agonopterix purpurea*			Southern Restricted	Locally commonly found. The larva feeds in the rolled leaves of Wild Carrot and Cow Parsley	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Borkhausenia fuscescens*			Universal	Frequently found. The larvae feed on dead plant material.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Depressaria daucella*			Universal	Frequently found. The larvae feed in untidy spinnings in the stems and flowers of Water Dropwort, and other herbaceous Rosaceae	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Depressaria radiella*			Universal	Commonly found. The larvae feed on the flowers and seeds of Wild Parsnip and Hogweed.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Oecophoridae	*Esperia sulphurella*			Universal	Commonly found. The larvae feeds on dead wood.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Anthocharis cardamines*			Universal	Orange Tip butterfly. Commonly found and highly mobile. The larvae feed on the flowers and developing seed pods of the taller-growing Brassicacaea, especially lady's smock, Cardamine sp. and hedge mustard, Alliaria petiolata.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Colias croceus*			Southern Widespread	Clouded Yellow. A migratory species.	0	1	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Gonepteryx rhamni*			Southern Widespread	Brimstone butterfly. Commonly found. The larva feeds on buckthorns.	0	1	1	1	0	0	1	0	0	1	0	1	1	0	0	1	1	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Pieris brassicae*			Universal	Large White butterfly. Commonly found. The larva feeds on various wild crucifers and legumes as well as cultivated cabbage.	0	1	0	0	1	1	1	0	0	1	1	1	1	1	1	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Pieris napi*			Universal	Green-veined White. Commonly found. The larva feeds on wild crucifers, preferring those growing in damp and sheltered areas.	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pieridae (White Butterflies)	*Pieris rapae*			Universal	Small White butterfly. Commonly found. The larva feeds on a range of wild crucifers as well as cultivated ones.	0	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
140 LEPIDOPTERA (Butterflies and Moths)	Psychidae	*Epichnopterix plumella*			Southern Restricted	Commonly found. The larvae fed in cases on grasses	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Psychidae	*Psyche casta*			Universal	Common A sexually dimorphic moth; the males are winged, but the females are wingless and remain in the larval case which is made from lengths of dried grass.	0	1	0	1	1	0	1	1	0	1	0	1	1	1	1	0	0	1	1	1

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140 LEPIDOPTERA (Butterflies and Moths)	Pterophoridae	*Adaina microdactyla*			Universal	Commonly found. The larva feeds on Hemp Agrimony within a stem gall.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pterophoridae	*Emmelina monodactyla*			Universal	Very commonly found Larvae feeds on bindweeds.	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pterophoridae	*Marasmarcha lunaedactyla*			Southern Widespread	Locally frequently found. The larvae feed on restharrow growing on chalk or sand.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pterophoridae	*Platyptilia gonodactyla*			Universal	Frequently found, but local. The larvae feed in the stems and flowers of Colt's-foot.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pterophoridae	*Stenoptilia zophodactyla*			Universal	Commonly found. The larva feeds on the flowers of Century and Yellow-wort.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Acrobasis advenella*			Universal	Commonly found. Larvae on Hawthorn.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Crambus pascuella*			Universal	Commonly found. The early stages are apparently undescribed, but related species feed on grasses.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Crambus perlella*			Universal	Commonly found. The early stages are apparently undescribed, but related species feed on grasses.	0	0	1	0	0	1	1	0	0	0	0	1	0	1	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Eurrhypara hortulata*			Universal	Commonly found. The larva feeds on a variety of herbaceous plants.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Evergestis extimalis*			Southern Restricted	Locally frequently found. Established in the Breck and Thames estuary, otherwise an occasional migrant, larvae feed on Cruciferae, especially perennial wall rocket Diplotaxis tenuifolia, charlock Sinapis arvensis and white mustard Sinapis alba.	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Homoeosoma sinuella*			Southern Widespread	The larva feeds in the rootstocks of plantain. Locally common in southern Britain.	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Nomophila noctuella*			Migrant	Migrant Can ocurr almost anywhere.	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Scoparia pyralella*			Universal	Commonly found. The larvae are believed to feed on decaying plant material.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Sitochroa palealis*			Southern Restricted	Very locally frequently found. Larvae in a web in the seed heads of Daucus carota.	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Sitochroa verticalis*			Southern Restricted	Commonly found. Larvae in many plants	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Pyralidae	*Synaphe punctalis*	Nationally Scarce b		Universal	Locally frequently found. The larvae feed on mosses, living in silken galleries.	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Schreckensteiniidae	*Schreckensteinia festaliella*			Universal	Frequently found. The larva feeds on bramble and raspberry.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Sesiidae (Clearwing Moths)	*Bembecia ichneumoniformis*	Nationally scarce b		Southern Widespread	6-Belted Clearwing. Locally frequently found, but easily missed. Flies fast in sunshine. Wasp mimic. Larva feeds at roots of Lotus corniculatus and Anthyllis vulneraria.	0	1	1	0	0	1	1	0	0	1	1	1	0	1	1	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Sesiidae (Clearwing Moths)	*Synanthedon formicaeformis*			Southern Widespread	Red-tipped Clearwing moth. Infrequently found. The larvae feedin the wood of sallows	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Sphingidae	*Laothoe populi*			Universal	Poplar Hawk-moth. Commonly found. The larvae feed on the leaves of poplars, aspen, willows and sallows.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Sphingidae	*Mimas tiliae*			Southern Restricted	Local The larva feeds on lime, elm and, occasionally, birch.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Tischeriidae	*Coptotriche marginea*			Southern Widespread	Commonly found. The larva mines within a leaf of bramble.	0	0	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tischeriidae	*Tischeria ekebladella*			Universal	Commonly found. The larva mines the leaves of oak and sweet chestnut.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Aethes tesserana*			Universal	Green Oak Tortrix moth. Commonly found. The larvae feed in rolled-leaves of oak and other broad-leaved trees. A very abundant species in oak woodland.	0	0	1	0	0	0	1	0	0	1	1	1	0	1	1	0	1	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Aethes williana*			Southern Restricted	The larva feeds on wild carrot, living in the lower part of the stem. Local in southern England.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Agapeta hamana*			Universal	Commonly found. The larva feeds in the roots of various thistle species.	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Aphelia paleana*			Universal	Commonly found. The larva feeds on the leaves herbs and grasses.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cacoecimorpha pronubana*			Southern widespread	Commonly found. The larva feeds on a wide variety of plants, including garden species. It became established in Britain in the early 20th century.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cacoecimorpha pronubana*			Universal	The Carnation Tortrix. Commonly found. First recorded at the start of the 20th Century. The larvae feed on a wide variety of herbaceous and woody plants.																				
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Celypha lacunana*			Universal	Commonly found. Feeds on the leaves of a variety of herbaceous plants.	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cochylimorpha straminea*			Universal	Commonly fgound. The larvae live in the stems of common knapweed. Fairly widely distributed in lowland Britain.	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cochylis atricapitana*			Universal	Commonly found. The larva feeds in the stems of Ragworts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cochylis hybridella*			Southern Restricted	Frequently found. The larva feeds on the seeds of Ox-tongues and Hawkweeds.	0	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cochylis nana*			Universal	Frequently found. The larva occurs on birch, feeding in the catkins.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cydia nigricana*			Southern Widespread	Commonly found. Feeds in the pods of legumes.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Cydia splendana*			Southern Widespread	Locally commonly found. Feeds on the fruit of Oak and Sweet Chestnut.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha acuminatana*			Universal	Commonly found. The larva feeds within the lower stem and rootstock of Ox-eye Daisy and Tansy.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha flavidorsana*			Southern Restricted	Frequently found. The larva feeds within the lower stem and rootstock of Tansy.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha petiverella*			Universal	Commonly found. The larvae feed in the rootstocks of yarrow and tansy.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha plumbagana*			Universal	Commonly found. The larva feeds within the lower stem and rootstock of yarrow.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha plumbana*			Universal	Commonly found. The larvae feed in the rootstocks of ox-eye daisy and yarrow.	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Dichrorampha sequana*			Southern Widespread	Locally commonly found. The larva feeds in the rootstocks of yarrow and ox-eye daisy.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Ditula angustiorana*			Universal	Commonly found. The larvae is widely polyphagous on both tree and herbaceous leaves.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Endothenia gentianaeana*			Southern Widespread	Locally commonly found. The larva lives in the seed-heads of teasel, feeding on the central pith.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Endothenia marginana*			Universal	Commonly found. The larvae feed in the seed heads of various herbs.	0	0	1	0	0	0	1	0	0	0	0	1	1	1	0	1	0	1	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Endothenia nigricostana*			Southern Restricted	Infrequently found. The larvae feed in the seed heads of Marsh Woundwort.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Epiblema cirsiana*			Universal	Commonly found. The larva feeds on common knapweed and possibly small species of thistle, living in the stems and roots.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Epiblema sticticana*			Universal	The larva feeds on colt's-foot, initially in the rootstock, later moving into the flower stem. Widely distributed in the British Isles.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Epinotia subocellana*			Universal	Commonly found. The larva feeds on sallows.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Epiphyas postvittana*			Universal	Commonly found. The larva feeds on the leaves of many plants. Established in UK in the early 20th Century.	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Eucosma cana*			Universal	Commonly found. The larva feeds in the flowerheads of various thistles and knapweeds.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Grapholita compositella*			Universal	Commonly found. The larva feeds in the stems and flowerheads of species of clover.	0	1	1	0	0	0	1	0	0	1	1	1	1	0	1	1	1	1	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Grapholita janthinana*			Southern Restricted	Locally commonly found. The larva feeds in the berries of hawthorn.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0

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140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Grapholita jungiella*			Southern Widespread	Locally commonly found. The larva feeds on various species of vetch.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Gynnidomorpha vectisana*			Southern Restricted	Locally frequently found. The larvae feed in the leaves and stems of Arrowgrass.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Gypsonoma dealbana*			Southern Widespread	Commonly found. The larva feeds on a number of tree species, living in the buds, shoots and catkins.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Hedya nubiferana*			Universal	Commonly found. The larvae feed on a range of deciduous shrubs.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Lathronympha strigana*			Universal	Commonly found. The larva feeds on various species of St John's-wort, spinning a terminal shoot.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Neosphaleroptera nubilana*			Southern Restricted	Commonly found. The larva feds on the leaves of Hawthorn and Cherry.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pammene agnotana*	pRDB1		Southern Restricted	Infrequently found. The larva feeds under the bark of old Hawthorn. Discovered in UK in 1961	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pammene aurana*			Universal	Commonly found, although more frequent in the south. Larvae live in webs spun between the seeds of Hogweed.	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pammene aurita*			Southern Widespread	Locally frequently found. The larva feeds on the seeds of sycamore. A species which is expanding its range.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pammene regiana*			Universal	Common The larva feeds on the seeds of sycamore, pupating under loose bark.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pammene rhediella*			Universal	Commonly found. The larva feeds in the flowers and fruits of Hawthorn.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Phalonidia affinitana*			Southern Restricted	Locally frequently found. The larvae feed on the leaves and seeds of Sea-aster	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Pseudargyrotoza conwagana*			Universal	Commonly found. The larva feeds in the seeds of ash and the berries of privet.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Ptycholoma lecheana*			Universal	The larvae feed on a variety of deciduous trees, rolling the leaves. Common throughout England and Wales.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Tortricidae (Leaf-roller Moths)	*Syndemis musculana*			Universal	Common The larvae feed on a wide variety of trees and shrubs.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Yponomeutidae	*Acrolepia autumnitella*			Southern Widespread	Locally frequently found. The larva feeds on nightshades, mining the leaves.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Yponomeutidae	*Argyresthia cupressella*			Southern Restricted	Infrequently found. The larva mines the shoots and leaves of cypress. New to Britain in 1997	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Yponomeutidae	*Argyresthia semifusca*			Universal	Commonly found. The larva mines the leaves of Hawthorn	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Yponomeutidae	*Plutella xylostella*			Universal	Migrant The larva feeds on various species of crucifer. A migrant species, frequently very common.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140 LEPIDOPTERA (Butterflies and Moths)	Zygaenidae (Burnett and Forester Moths)	*Zygaena filipendulae*			Universal	6-spot Burnet moth. Commonly found. The larva feeds on bird's-foot trefoil but also needs long grass on which to make its cocoon.	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
140 LEPIDOPTERA (Butterflies and Moths)	Zygaenidae (Burnett and Forester Moths)	*Zygaena lonicerae*			Southern Widespread	Narrow-bordered 5-spot Burnet moth. Commonly found. The larva feeds on meadow vetchling but also needs long vegetation on which to make its cocoon. On Downland.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Anobiidae (Woodworm Beetles)	*Anobium fulvicorne*			Southern Restricted	Frequently found. Breeds in dead wood	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anobiidae (Woodworm Beetles)	*Anobium inexspectatum*	Nationally Scarce b		Southern Widespread	Infrequently found. This species closely resembles the common furniture beetle but its larvae bore into old ivy.	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anobiidae (Woodworm Beetles)	*Anobium punctatum*			Universal	The woodworm beetle. Very commonly found. Larvae bore into timber (both hardwood and softwood), also in furniture.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anobiidae (Woodworm Beetles)	*Ochina ptinoides*			Southern Widespread	Locally frequently found. Breeds in dead Ivy stems.	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Anthicidae	*Anthicus antherinus*			Southern Restricted	Commonly found. Amongst plant litter.	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anthicidae	*Cordicomus instabilis*			Southern Widespread	Locally frequently found. Coasts of southern England, in saltmarshes, often running on bare mud.	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anthicidae	*Cyclodinus constrictus*			Southern Retricyed	Locally frequently found. In saltmarshes, often running on bare mud.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anthicidae	*Notoxus monoceros*			Southern Widespread	Frequently found. On sandy soils, most frequent on the coast	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anthicidae	*Stricticollis tobias*			Southern Widespread	Comonly found. Associated with piles of organic rubbish.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Anthribidae	*Anthribus fasciatus*	Nationally Scarce a		Universal	Rarely found. Greatly reduced distribution since 1970. Associated with scale insects on trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Aspidapion aeneum*			Southern Widespread	Frequently found. On mallow Malva species	0	1	0	0	0	0	1	0	0	1	0	0	1	1	1	1	1	0	0	1
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Aspidapion radiolus*			Universal	Frequently found. On mallow Malva species	0	1	0	0	0	1	1	0	0	1	0	0	1	1	1	1	1	1	0	1
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Betulapion simile*			Southern Widespread	Commonly found. On birch Betula species	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Catapion cineraceum*	Nationally Scarce b		Southern Restricted	Infrequently found. It was formerly more widespread but is now very local Phytophagous. Associated with Self-heal Prunella vulgaris, the larvae are thought to be root feeders.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Catapion curtisii*	Nationally Scarce a		Southern Restricted	Very local, rarely found. There are recent (post-1970) records from only a few coastal sites in the Isle of Wight, South Hampshire, East S Phytophagous. The larvae develop in galls in the rootstocks of white clover Trifolium repens and strawberry clover Trifolium fragiferum. Adults have also been recorded from subterranean clover Trifolium subterraneum in the Isle of Wight.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Catapion seniculus*			Southern Widespread	Commonly found, On Trifolium species, mainly T. hybridum and possibly Medicago spp. Larvae in stems.	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Ceratapion carduorum*			Southern Restricted	Locally frequently found.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Ceratapion gibbirostre*			Universal	Commonly found. On Creeping Thistle Cirsium arvense	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Ceratapion onopordi*			Universal	Commonly found, on Arctium, Centaurea & thistles	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Diplapion stolidum*	Nationally Scarce b		Southern Widespread	Locally frequently found.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Eutrichapion ervi*			Universal	Commonly found. On vetches, especially Lathyrus pratensis	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Eutrichapion viciae*			Universal	Frequently found, on Yellow Vetchling Lathyrus pratensis	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Exapion fuscirostre*			Southern Restricted	Locally frequently found, on Broom	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Exapion ulicis*			Universal	Commonly found, on gorse, especially Ulex europaeus	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Holotrichapion aethiops*			Universal	on vetches Vicia	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Holotrichapion pisi*			Universal	Commonly found. Associated with Medicago species, larvae develop in vegetative buds.	0	1	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Ischnopterapion loti*			Universal	Commonly found, on Bird's-foot Trefoil Lotus corniculatus	0	1	1	0	0	1	1	0	0	1	0	1	1	1	1	0	0	1	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Malvapion malvae*			Southern Restricted	Frequently found. On mallow Malva species	0	1	1	0	0	1	1	0	0	1	0	0	1	1	1	1	1	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Oxystoma cerdo*	Nationally Scarce b		Southern Widespread	Widespread but local, formerly confined to the midlands and northern Britain. Now recorded widely in south-east England, where it is possibly a recent colonist. Phytophagous. Associated with vetches, especially tufted vetch Vicia cracca. The larvae develop in the pods feeding on the seeds.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Oxystoma craccae*			Southern Widespread	Frequently found. The larvae feed in the seedpods of Vetches.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Oxystoma pomonae*			Southern Restricted	Frequently found. On Yellow Vetchling Lathyrus pratensis	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	1	0	1	1	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Perapion curtirostre*			Universal	Commonly found, on dock Rumex species	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Perapion hydrolapathi*			Universal	Commonly found, on dock Rumex species	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Perapion violaceum*			Universal	Commonly found, on dock Rumex species	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Pirapion immune*	Nationally Scarce b		Universal	Infrequently found. On Broom Cytisus scoparius, larvae in galls on young stems	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion apricans*			Universal	Commonly found, on Red Clover Trifolium pratense	0	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion assimile*			Universal	Commonly found. On Trifolium species	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion difforme*	Nationally Scarce b		Southern Widespread	Locally frequently found. Often in marshy grasslands. Associated with Lotus sp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion filirostre*	Nationally Scarce b		Southern Widespread	Locally frequently found. On Trifolium campestre, T. dubium & T. aureum. Larvae in flower heads.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion fulvipes*			Universal	Commonly found, on clover Trifolium repens & T. hybridum	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	1
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion nigritarse*			Southern Widespread	Commonly found. On Trifolium campestre, T. dubium & T. aureum. Larvae in flower heads.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	1
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion ononicola*			Southern Widespread	Infrequently found. On restharrow, Ononis spp, larvae develop in the flowers.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Protapion trifolii*			Southern Widespread	Commonly found. On clover Trifolium pratense & T. medium	0	0	1	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Pseudapion rufirostre*			Southern Widespread	Frequently found. On mallow Malva species	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	1
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Stenopterapion meliloti*			Southern Restricted	Locally frequently found. Associated with Melilotus, larvae develop in the stems.	0	1	1	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Stenopterapion tenue*			Southern Widespread	Commonly found. On Medicago and probably Melilotus species.	0	1	1	0	0	0	0	0	0	1	0	1	0	1	1	1	0	1	0	0
150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Taeniapion urticarium*			Southern Restricted	on Stinging Nettle Urtica dioica	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Attelabidae (Weevils)	*Deporaus betulae*			Universal	Commonly found, on birch, alder & hazel, larvae in leaf rolls	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchidius imbricornis*			Southern Restricted	Locally frequently found. A very recent discovery. Associated with Goat's Rue Calega officinalis. Larvae develop and pupate in the seeds.	0	1	0	0	0	0	0	1	0	1	0	1	0	0	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchidius varius*			Southern Restricted	Commonly found, on clover Trifolium pratense & T. medium	0	1	1	0	1	1	1	0	0	1	0	1	0	1	1	1	0	1	0	0
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchidius villosus*			Universal	Commonly found. The larvae feed in the seed pods of Broom.	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchus brachialis*			Southern Restricted	Locally commonly found, on Fodder Vetch Vicia villosus. Larvaer develop in the seed pods.	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchus loti*			Southern Restricted	Commonly found, on Bird's-foot Trefoil Lotus corniculatus	0	1	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchus rufimanus*			Southern Widespread	Commonly found. On Yellow Vetchling Lathyrus pratensis. also on stored legume crops.	0	1	1	0	0	1	1	0	0	1	0	1	0	1	1	1	0	1	0	0
150 COLEOPTERA (Beetles)	Bruchididae (Seed Weevils)	*Bruchus rufipes*			Southern Restricted	Commonly found. On Fabaceae.	0	1	1	1	0	1	1	0	1	1	0	0	0	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Buprestidae	*Agrilus laticornis*	Nationally Scarce b		Southern Restricted	Frequently found. Widespread but local in central and southern England. Associated with broad-leaved woodland, particularly oak and hazel coppice. The larvae develop under thin bark of dying oak branches and twigs, especially those with leaves still attached.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Buprestidae	*Agrilus viridis*	Nationally Scarce a		Southern Restricted	Local and infrequently found. It has spread to several new sites since the hurricane of 1987 but this expansion may be temporary. The larvae develop under bark of goat willow Salix caprea and grey willow Salix cinerea. Damaged or dying trees are preferred to healthy examples.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Buprestidae	*Trachys scrobiculatus*	Nationally Scarce a		Southern Restricted	Very local and infrequently found. The larvae are leaf miners of Ground Ivy Glechoma hederacea and possibly other species of Labiatae. The adults are difficult to find and the species may be under recorded.	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0
150 COLEOPTERA (Beetles)	Byrrhidae	*Curimopsis maritima*			Southern Widespread	Commonly found. Associated with sparsely-vegetated, dry soils, mostly coastal.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Byrrhidae	*Byrrhus pilula*			Universal	Commonly found. It lives on the ground in open situations, feeding on moss.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Byrrhidae (Pill Beetles)	*Chaetophora spinosa*			Southern Restricted	Frequently found. Associated with sparsely vegetated chalky soils.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Byturidae (Raspberry Beetles)	*Byturus tomentosus*			Universal	Commonly found, on Rosaceae	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis cryptica*			Universal	Commonly found. Associated with areas of lush vegetation.	0	0	1	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis decipiens*			Southern Widespread	Commonly found, most frequently near woodland	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis figurata*			Universal	Locally infrequently found. Associated with marshland and damp meadows.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis lateralis*			Southern Widespread	Commonly found, associated with grassland habitats	0	1	1	0	0	0	1	1	1	1	0	0	0	0	0	1	0	1	0	0

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150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis livida*			Southern Widespread	Commonly found.	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis nigra*			Universal	Commonly found. In lowland marshes and meadows	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis nigricans*			Universal	Commonly found. Often in wet grassland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis pellucida*			Universal	Commonly found. In broadleaf woodland habitats.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis rufa*			Universal	Commonly found in lowland marshes and meadows.	0	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis rustica*			Southern Widespread	Commonly found, in a variety of grassland habitats	0	1	0	0	1	0	1	0	0	1	0	0	0	1	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Cantharis thoracica*			Southern Widespread	Locally frequently found. A wetland species.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Crudosilis ruficollis*	Nationally Scarce b		Southern Restricted	Frequently found. Formerly a rare and very local wetland species but it has evidently spread over the last 40 years. Now widespread but local in England and South Wales and is especially found on reeds Phragmites in fenland habitats. Adults and larvae are probably predatory	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Malthinus balteatus*	Nationally Scarce b		Southern Restricted	Infrequently found. Associated with broad-leaved woodland, both larvae and adults are probably predatory.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Malthinus flaveolus*			Universal	Commonly found, on the foliage of trees and shrubs	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Malthinus seriepunctatus*			Southern Widespread	Commonly found, in broadleaf woodland habitats	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Malthodes minimus*			Universal	Commonly found, on the foliage of trees and shrubs.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Rhagonycha fulva*			Universal	Commonly found. In a wide variety of habitats.	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Rhagonycha lignosa*			Universal	Commonly found, on the foliage of trees and shrubs	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Rhagonycha limbata*			Southern Widespread	Commonly found. In grassland habitats	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cantharidae (Soldier Beetles)	*Rhagonycha lutea*	Nationally Scarce b		Southern Widespread	Commonly found but local. It prefers woodland margins with long grass and scrub. Both larvae and adults are probably predatory.	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Abax parallelepipedus*			Universal	Commonly found, flightless and predatory, in woodland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Acupalpus dubius*			Southern Widespread	Commonly, found amongst litter in marshy habitats	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Acupalpus parvulus*			Southern Widespread	Locally frequently found, on open wet acidic soils	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Agonum emarginatum*			Universal	Commonly found. In wetlands and on the edges of waterbodies.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Agonum fuliginosum*			Universal	Commonly found. Damp graslands.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Agonum thoreyi*			Universal	Commonly found. Associated with well-vegetated marshes.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Agonum viduum*			Universal	Commonly found. At edges of water bodies.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara aenea*			Universal	Commonly found, in open sunny habitats	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara communis*			Universal	Commonly found. In a variety of open habitats, including damp ones.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara convexior*			Southern Widespread	Frequently found. Open, sunny vegetation.	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara lunicollis*			Universal	Commonly found in a variety of habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara montivaga*			Southern Restricted	Locally commonly found, in open sunny habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara ovata*			Universal	Commonly found. Feeds on seeds.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara plebeja*			Universal	Commonly found. On humid vegetated soils, often near water, also on arable land. A seed feeder.	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara plebeja*			Universal	Locally commonly found, in damp grasslands.																				

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Amara tibialis*			Universal	Commonly found. Sandy soils.	0	1	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Anchomenus dorsalis*			Universal	Commonly found. Open, disturbed areas.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Anisodactylus poeciloides*	RDB 3	S41	Southern Restricted	Infrequently found. A coastal species associated with salt marsh and grazing marsh ditches. Probably phytophagous.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Asaphidion stierlini*			Southern Widespread	Infrequently found. Part of a complex formerly known as A. flavipes. Associated with sparsely vegetated, dry soils in eastern England.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Badister bullatus*			Universal	Commonly found	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion assimile*			Southern Widespread	Frequently found, but local. In marshes and swamps	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion biguttatum*			Universal	Commonly found, on damp grasslands or margins of water bodies.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion femoratum*			Universal	Frequently found. Largely coastal. Associated with damp, bare soils which are open to the sun.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion fumigatum*	Nationally Scarce b		Southern Widespread	Infrequently found. Very local in wetlands.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion lampros*			Universal	Commonly found, on open dry soils, including arable land	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion lunulatum*			Southern Widespread	Commonly found	0	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion minimum*			Universal	Commonly found. On mud and in tidal debris in estuaries and saltmarshes	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion obtusum*			Southern Widespread	Commonly found. Associated with bare and re-vegetating ground.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion properans*			Southern Widespread	Commonly found. Associated with open sunny places.	0	1	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion quadrimaculatum*			Southern Widespread	Commonly found, on open dry soils, including arable land	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bembidion varium*			Southern Widespread	Frequently found. Associated with saltmarsh.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Brachinus crepitans*	Nationally Scarce b		Southern Restricted	Frequently found but local. Associated with open stoney places, particularly on calcareous soils. It has been found in chalk and limestone quarries, the margins of arable fields, clay-pits, and in various coastal habitats including stabilised shingle beaches. Adults are gregarious and are found under stones or at plant roots. Adults are predatory and the larvae are probably parasitic on pupae of other beetles.	0	1	0	0	1	0	1	0	0	0	1	0	1	1	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bradycellus harpalinus*			Universal	Commonly found, in open country, including heaths	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Bradycellus verbasci*			Universal	Commonly found. Open sites including brownfield sites and arable land. On well drained soils.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Calathus fuscipes*			Universal	Commonly found. Associated with open habitats.	0	1	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Calathus melanocephalus*			Universal	Commonly found. Associated with open habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Calathus rotundicollis*			Universal	Found in a variety of habitats but often associated with woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Carabus violaceus*			Universal	Commonly found. In a variety of habitats.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Cicindela campestris*			Universal	Green Tiger Beetle. Locally frequently found. Strongly associated with open habitats with sunny bare ground, including heaths or moors.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Clivina fossor*			Universal	Commonly found	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Curtonotus aulicus*			Universal	Commonly found, adults feed on seeds of Asteraceae	0	1	0	0	0	1	1	0	0	1	0	0	0	0	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Curtonotus convexiusculus*			Universal	Frequently found, Coastal, but also found in dry open situations well inland.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Demetrias atricapillus*			Southern Widespread	Commonly found. In grassland habitats and cereal fields.	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Demetrias imperialis*	Nationally Scarce b		Southern Restricted	Frequently found. 100 years ago this species was rare and declining but during the past fifty years it has spread from its headquarters in East Anglia and Kent to many parts of southern England and may still be increasing its range. It occurs in wetland habitats and is particularly associated with reed-beds in fens and coastal grazing marshes.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Dicheirotrichus gustavii*			Universal	Commonly found. A saltmarsh species living around the high tide mark. Under strand-line litter. Predatory.	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Dromius quadrimaculatus*			Universal	Commonly found. Lives in trees.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Harpalus affinis*			Universal	Commonly found	0	1	0	1	1	0	1	0	0	0	0	1	0	1	1	0	1	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Harpalus attenuatus*			Southern Restricted	Infrequently found. Associated with dry sandy habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Harpalus rubripes*			Universal	Frequently found, but local. On dry often sandy soils in open situations	0	0	0	1	0	0	1	0	0	0	0	1	0	1	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Harpalus rufipes*			Universal	Commonly Found	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Harpalus tardus*			Universal	Commonly found. Herbivorous, feeding on seeds and fruits of various plants, often nocturnally. It is a species of dry, open habitats.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Leistus fulvibarbis*			Universal	Commonly found. Damp woodland, amongst leaf litter.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Leistus spinibarbis*			Southern Widespread	Frequently found. Associated with wooded locations.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Loricera pilicornis*			Universal	Very commonly found. A variety of habitats, but very dry ones.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Microlestes maurus*			Southern Restricted	Commonly found. Associated with leaf litter on dry soils.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Microlestes minutulus*			Southern Restricted	Rarely found. A recent addition to the UK species list, coastal. Spreading in UK. Associated with dry vegetation litter.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Nebria brevicollis*			Universal	Very commonly found in a variety of habitats.	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Notiophilus biguttatus*			Universal	Very commonly found. In many different habitats, including gardens.	0	1	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Notiophilus substriatus*			Universal	Commonly found, on open dry soils with sparse vegetation	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Olisthopus rotundatus*			Universal	Frequently found	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Ophonus ardosiacus*	Nationally Scarce b		Southern Restricted	Found mainly on chalk but occasionally on clay soils, in cultivated land, undercliffs, cliff-tops, sea walls and upper levels of beaches. Phytophagous, feeding mainly on seeds.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Ophonus azureus*	Nationally Scarce b		Southern Restricted	Uncommonly found. Open, clay soils on the coast and also inland on warm chalk or limestone slopes. The Beckton examples were the form similis Dejean which lack the metallic green colouration of most British specimens.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Ophonus puncticeps*			Southern Widespread	Commonly found. In dry grasslands. Feeds on seeds.	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Ophonus rufibarbis*			Universal	Commonly found. On clay soils with humic content, often in partly shady places, including gardens and agricultural land.	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Oxypselaphus obscurus*			Southern Widespread	Commonly found. It occurs in damp areas such as wet woodland and marshes.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Panagaeus bipustulatus*	Nationally Scarce b		Southern Widespread	Infrequently found. Associated with sparsely vegetated sandy of chalky soils.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Paradromius linearis*			Universal	Commonly found, in grassland habitats	1	1	1	0	0	1	1	0	0	1	0	1	1	1	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Philorhizus melanocephalus*			Universal	Commonly found, in dry grassland habitats	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Platyderus depressus*	Nationally Scarce b		Southern Widespread	Frequently found. Associated with dry sandy or calcareous soils.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Poecilus cupreus*			Southern Widespread	Commonly found. Often associated with arable land.	0	1	0	1	0	0	1	1	1	1	0	1	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Poecilus lepidus*	Nationally Scarce b		Universal	Infrequently found. Associated with open, dry heathlands.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pogonus chalceus*			Universal	Commonly found. A littoral species, found under litter in saltmarsh.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus gracilis*	Nationally Scarce b		Southern Widespread	Infrequently found. Local, associated with wetlands.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus madidus*			Universal	Commonly found, in a wide variety of habitats	0	1	0	1	1	0	1	0	0	1	0	1	1	1	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus melanarius*			Universal	Commonly found. Open habitats.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus minor*			Universal	Frequently found	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus niger*			Universal	Commonly found. Damp woodland an moors.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus rhaeticus*			Universal	In damp grassland, mainly in exposed nutrient poor sites. Local in south.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus strenuus*			Universal	Commonly found. In woodland and damp grassland habitats.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Pterostichus vernalis*			Universal	Commonly found. Damp grassland	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Stenolophus mixtus*			Southern Widespread	Commonly found. Wetland habitats	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Syntomus foveatus*			Universal	Commonly found, on open dry soils, including arable land	0	1	1	0	0	0	1	1	0	0	0	1	0	1	0	0	1	0	0	0
150 COLEOPTERA (Beetles)	Carabidae (Ground Beetles)	*Trechus quadristriatus*			Universal	Commonly found. associated with open areas, including agricultural land.	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Agapanthia villosoviridescens*	Nationally Scarce b		Southern Widespread	Infrequently found in the south of England, has made large increases in distribution recently. The larvae mine the stems of large herbaceous plants such as thistles and hogweed.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Clytus arietis*			Southern Widespread	Commonly found in woods and hedgerows. The larvae breed in dry dead wood.	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Grammoptera ruficornis*			Southern Widespread	Commonly found in woodland habitats. Larvae develop in small twigs.	0	0	1	1	1	1	1	1	0	1	0	1	0	1	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Leiopus nebulosus s.l.*			Southern Widespread	Commonly found. The larvae develop in hard-wood timber. Two species are found under this name.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Leptura quadrifasciata*			Universal	Locally frequently found. Adults visit flowers, breeds in dead wood	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Phytoecia cylindrica*	Nationally Scarce b		Southern Widespread	Infrequently found. The larvae live in umbelifer stems in open graslands	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Pogonocherus hispidus*			Southern Widespread	Frequently found but local, often on holly or apple, breeds in dead wood	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Pseudovadonia livida*			Southern Restricted	Commonly found. In dry grassland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Rutpela maculata*			Southern Widespread	Commonly found, adults visit flowers, breeds in tree stumps.	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Stenurella melanura*			Southern Widespread	Locally commonly found, adults visit flowers, breeds in dead wood	0	0	1	1	0	1	1	0	0	0	1	1	0	1	0	0	1	1	0	0
150 COLEOPTERA (Beetles)	Cerambycidae (Long-horn Beetles)	*Tetrops praeustus*			Southern Widespread	Commonly found. The larvae develop in dead twigs. The adults are often found on Hawthorn blossom.	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Altica lythri*			Southern Widespread	Commonly found. Adult and larvae fed on Willowherbs.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Aphthona euphorbiae*			Southern Widespread	Commonly found, often on ivy, a pest of flax Linum species	0	0	1	0	0	1	1	1	0	1	0	1	0	0	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cassida rubiginosa*			Universal	Commonly found, on thistles	0	0	1	0	0	0	1	1	0	1	0	0	0	0	1	1	1	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cassida vibex*			Southern Widespread	Commonly found, on thistles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Chaetocnema concinna s.s.*			Universal	Frequently found. One of a complex of two species, C. concinna and C. picipes. Both feed on Polygonaceae.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Chaetocnema hortensis*			Universal	Commonly found. It feeds on a range of grasses.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0

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150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Chrysolina americana*			Southern Restricted	A recent arrival from the Mediterranean region with a distribution centred around London although there are several records from elsewhere. Associated with Lavender and Rosemary.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Chrysolina banksi*			Southern Widespread	Locally frequently found, often coastal. Feed on a variety of herbaceous plants.	0	0	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Chrysolina hyperici*			Southern Widespread	Commonly found,on St John's-wort Hypericum species	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Crepidodera aurata*			Universal	Commonly found, on willows Salix species	0	1	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Crepidodera aurea*			Southern Widespread	Commonly found, on willows Salix species	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Crepidodera fulvicornis*			Universal	Common, on willows Salix species	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus aureolus*			Universal	Frequently found. Adults are usually seen in the flowers of yellow Asteraceae growing in short turf. It is not known what the larvae do.	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus fulvus*			Southern Widespread	Locally commonly found, in dry grassland	0	1	1	1	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus hypochaeridis*			Southern Widespread	Frequently found on calcareous grasslands. Adults usually seen in flowers, especially those of Asteracea. Details of life-history not known.	0	1	1	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus labiatus*			Universal	Commonly found, on foliage of broadleaf trees.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus moraei*			Southern Widespread	Frequently found. The adults and larvae feed on St. John's Wort growing in short vegetation.	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Cryptocephalus pusillus*			Southern Widespread	Commonly found, on foliage of broadleaf trees.	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Epitrix pubescens*			Southern Widespread	Frequently found. On Woody Nightshade Solanum dulcamara	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Galerucella lineola*			Universal	Commonly found, on alder in wetland habitats	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Galerucella sagittariae*			Universal	Frequently found. Associated with wetlands. feeds on the leaves of a range of plant species, including Runicaceae and Rosaceae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Lema cyanella*			Universal	Commonly found, on thistles	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Lochmaea crataegi*			Southern Widespread	Commonly found on hawthorn Crataegus species	0	0	0	1	0	0	1	0	0	1	0	1	0	1	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus ballotae*	Nationally Scarce b		Southern Widespread	Infrequently found. On Lamiaceae, especially Ballota nigra, but also recorded from Lamium album, Marrubium vulgare, Mentha arvensis, Glechoma hederacea and Stachys species.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus dorsalis*	Nationally Scarce b		Southern Widespread	Locally frequently found. Phytophagous. Associated with ragwort Senecio	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus exoletus*	Nationally scarce a		Southern Restricted	Commonly found. Associated with Boraginaceae. Adults feed on the leaves, larvae mine the roots.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus flavicornis*			Southern Restricted	Commonly found, on Ragwort Senecio jacobaea	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus fowleri*	Nationally scarce a		Southern Restricted	Frequently found, often on teasel. Endemic to British Isles.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus melanocephalus*			Universal	Common, on Ribwort Plantain Plantago lanceolata	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus parvulus*	Nationally Scarce a		Southern Restricted	After having undergone a period of decline, this tiny flea-beetle is now common almost everywhere in southern England. It is thought to be associated with Linum species and its present abundance may well be connected with the current trend in growing flax as a commercial crop.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus pratensis*			Universal	Commonly found, on Ribwort Plantain Plantago lanceolata	0	1	0	0	0	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus rubiginosus*			Southern Widespread	Common, on bindweed Calystegia species	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Longitarsus succineus*			Universal	Commonly found. Both adults and larvae feed on the foliage of various Asteraceae.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Neocrepidodera ferruginea*			Southern Widespread	Frequently found, restricted to thistles?	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Neocrepidodera transversa*			Universal	Commonly found. On thistles	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Oomorphus concolor*			Universal	Locally frequently found. Feeds on Ivy.	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Oulema melanopus s.s.*			Universal	Commonly found. A pest of cereal crops, also feeds on larger wild grasses.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Oulema rufocyanea*			Universal	Commonly found, on grasses	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phaedon cochleariae*			Universal	Commonly found. Feeds on the leaves of Brassicaceae	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phaedon tumidulus*			Universal	It feeds on the leaves of various umbellifers, especially hogweed.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phratora laticollis*			Universal	Commonly found, often in association with Poplars and Aspen.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phratora vitellinae*			Universal	Commonly found, on willows Salix species	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phratora vulgatissima*			Universal	Commonly found, often in association with Willows, Poplars and Aspen.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phyllotreta atra*			Southern Widespread	Commonly found. Feeds on Brasicaceae.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phyllotreta nigripes*			Universal	Commonly found, on Brassicaceae	0	1	1	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0	1
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phyllotreta undulata*			Universal	Commonly found. Most often associated with Brassicaceae, but may also be on Resedacea and Chenopodaceae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Phyllotreta vittula*			Universal	Locally frequently found. The adults feed on the leaves of a variety of herbaceous plants.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Plagiodera versicolora*			Southern Restricted	Frequently found. The larvae and adults feed on the leaves of Salicaceae, especially Crack Willow.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Podagrica fuscicornis*	Nationally Scarce b		Southern Widespread	Locally frequently found. Adults feed on foliage and larvae on roots of Mallows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Podagrica fuscipes*	Nationally Scarce b		Southern Restricted	Frequently found, on Malvaceae, the larvae probably fed at the roots, the adults on the leaves.	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	1
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Psylliodes affinis*			Southern Widespread	Commonly found. Feeds on Solanaceae.	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Psylliodes chrysocephala*			Universal	Very commonly found. A pest of cabbages.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Chrysomelidae (Leaf Beetles)	*Sphaeroderma testaceum*			Universal	Commonly found, on thistles	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0
150 COLEOPTERA (Beetles)	Clambidae	*Clambus armadilo*			Universal	Frequently found. Amongst vegetation litter in wetlands	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cleridae	*Opilo mollis*	Nationally Scarce b		Southern Widespread	Infrequently found. The larvae are predatory on woodworm beetles (Anobiidae) within dead wood.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Adalia bipunctata*			Universal	Very commonly found. Larvae and adults feed on aphids, usually on shrubs and low-growing plants.	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Adalia decempunctata*			Universal	Commonly found, on foliage of broadleaf trees.	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	0	0	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Anatis ocellata*			Universal	Commonly found, on pine	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Anisosticta novemdecimpunctata*			Southern Widespread	Locally frequently found. Feeds on aphids on water-side vegetation.	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Calvia quattuordecimguttata*			Universal	Commonly found, on foliage of broadleaf trees.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Chilocorus renipustulatus*			Southern Widespread	Commonly found, on foliage of broadleaf trees, but mainly sallow willow. Preys on scale insects.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Coccidula rufa*			Universal	Commonly found. Often associated with Reeds and Typha in wetlands.	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Coccidula scutellata*			Southern Widespread	Infrequently found and local. Associated with wetland habitats. Preys on aphids on reeds and rushes.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Coccinella septempunctata*			Universal	Commonly found. In a wide variety of habitats	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Exochomus quadripustulatus*			Universal	Commonly found, chiefly on pine. Feeds on scale insects.	0	0	1	0	1	1	1	0	0	0	0	0	1	0	0	0	1	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Halyzia sedecimguttata*			Southern Widespread	Commonly found, on tree foliage, often on Sycamore.	0	0	1	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Harmonia axyridis*			Southern Widespread	Harlequin Ladybird. Commonly found. A fairly large ladybird occurring in a wide range of colour patterns. It occurs on various herbaceous plants and trees, the larvae being predatory on aphids and other insects. A recent addition to the British fauna, spreading rapidly.	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Henosepilachna argus*			Universal	Frequently found. Adults and larvae are vegetarian, feeding on white bryony. A recent addition to the British fauna.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Hippodamia variegata*	Nationally Scarce b		Southern Widespread	Frequently found but local in southern England and Wales. Associated with a variety of habitats especially dry grassland on sandy soils. The larvae and adults are predatory upon aphids.	0	1	1	0	0	1	1	1	1	0	0	1	0	0	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Nephus quadrimaculatus*	RDB 2		Southern Restricted	Infrequently found, but increasing. A predator of scale insects. Especially associated with Ivy.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Nephus redtenbacheri*			Universal	Frequently found, but local, in sparsely vegetated grassland. Feeds on scale insects	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Platynaspis luteorubra*	Nationally Scarce a		Southern Restricted	Infrequently found and very local. Predatory on subterranean aphids and associated with ant nests.	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Propylea quattuordecimpunctata*			Universal	Commonly found. In a wide variety of habitats	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Psyllobora vigintiduopunctata*			Southern Widespread	Commonly found. In grassland habitats	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1

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150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Rhyzobius chrysomeloides*			Southern Widespread	Frequently found. A recent arrival which appears to be spreading. Feeds on Aphids.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Rhyzobius litura*			Universal	Commonly found, in grassland habitats. Feeds on scale insects.	0	1	1	0	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Rhyzobius lophanthae*			Southern Restricted	Infrequently found, but spreading. A colonist from eastern Australia. First recorded in Britain in 1999 at Morden Park, Surrey, now found in south-west London and at Lewes, East Sussex. Found on a variety of alien shrubs including cypress. A predator of scale insects.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Scymnus frontalis*			Southern Widespread	Commonly found, in dry grassland	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Scymnus interruptus*			Southern Restricted	Infrequently found, but increasing. A recent arrival in the UK. Feeds on scale insects.	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Scymnus limbatus*	Nationally Scarce b		Southern Widespread	Infrequently found. Wetland, associated with Salix species where it feeds on aphids.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Scymnus limbatus*	Nationally Scarce B		Southern Widespread	Rarely found. Very local. Preys on aphids and coccids, largely on willows and poplars. Damp places.																				
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Scymnus schmidti*	Nationally Scarce b		Universal	Locally frequently found in sandy and chalky grassland habitats in southern England and in coastal habitats north of a line from Bristol to The Wash. A predatory species	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Stethorus punctillum*			Southern Widespread	Infrequently found. Very local. Feds on mites and aphids.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Subcoccinella vigintiquattuorpunctata*			Universal	Commonly found, in dry grassland	0	1	1	1	0	1	1	0	0	1	0	0	1	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Coccinellidae (Ladybird Beetles)	*Tytthaspis sedecimpunctata*			Universal	16-spot ladybird. Commonly found, in wet grassland	1	0	1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Colydiidae	*Bitoma crenata*			Southern Restricted	Commonly found. Associated with dead wood, on or off living trees.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Corylophidae	*Corylophus sublaevipennis*			Southern Restricted	Frequently found. Local	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Corylophidae	*Sericoderus brevicornis*			Southern Restricted	Frequently found. A recent colonist from New Zealand. Possibly associated with fungus.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Cryptophagidae (Fungus beetles)	*Antherophagus pallens*			Universal	Commonly found. In the nests of Bumblebees.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cryptophagidae (Fungus beetles)	*Antherophagus silaceus*	Nationally Scarce b		Southern Restricted	Infrequently found and local. Larvae in the nests of Bumblebees, adults in flowers.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cryptophagidae (Fungus beetles)	*Atomaria scutellaris*	RDB K		Southern Restricted	Infrequently found. For many years this tiny beetle was known in Britain only from the Isles of Scilly. However, it has recently become established in south-east England. It has been found in a variety of habitats but is perhaps most frequent near the coast.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cryptophagidae (Fungus beetles)	*Cryptophagus pubescens*			Universal	Frequently found. Associated with Wasp nests, feeds on moulds.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Cryptophagidae (Fungus beetles)	*Ephistemus globulus*			Universal	Commonly found. In decaying vegetation.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Amalus scortillum*			Southern Widespread	Commonly found. Larvae feed in the roots of Knotgrass.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Andrion regensteinensis*			Universal	Commonly found, on Cytisus scoparius, Ulex and Genista	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Anthonomus pedicularius*			Universal	Commonly found. On hawthorn Crataegus species	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	0	0	1	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Anthonomus rubi*			Universal	Commonly found. On herbaceous Rosaceae species.	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Archarius pyrrhoceras*			Universal	Commonly found, on oak	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Archarius salicivorus*			Universal	Commonly found, on willows Salix species	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Bagous argillaceus*	RDB 2		Southern Restricted	Rarely found. Very localised to Thames Corridor (mostly). Brackish marshes where it probably feds on grasses.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Barypeithes pellucidus*			Southern Restricted	Commonly found on low growing plants.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Bradybatus fallax*			Southern Restricted	Infrequently found. A very recent colonist. Associated with Sycamore.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Cathormiocerus spinosus*	Nationally Scarce b		Universal	Locally infrequently found. Associated with grassland, both on sandy and soils. Phytophagous, probably polyphagous and parthenogenetic. The larvae may feed on plant roots or litter. It has been recorded from the base of Sheeps Sorrel, Bird's-foot Trefoil and Plantain species.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus contractus*			Universal	Commonly found. In a variety of grassland and ruderal habitats. Polyphagous on a wide variety of Brassicaceae.	0	1	1	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus obstrictus*			Universal	Commonly found. Feeds on Brassicaceae	0	1	1	0	0	1	1	0	0	1	0	0	0	1	1	1	1	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus pallidactylus*			Universal	Commonly found, on Brassicaceae.	0	1	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	0	1
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus picitarsis*			Southern Widespread	Frequently found. local, on disturbed soils. The larvae feed in the stems of Brassicaceae.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus turbatus*			Southern Widespread	Frequently found. Mainly southern England and East Anglia, recently in North Wales, probably spreading, as is the host plant. On open, often disturbed ground, associated with Hoary Cress Lepidium draba, larvae develop in the fruits, pupates in the soil. First found in Britain in 1951.	0	1	1	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Ceutorhynchus typhae*			Universal	Commonly found, on Brassicaceae	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Cionius scrophulariae*			Universal	Locally commonly found. Larvae feed on leaves of Scrophulariaceae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Cionus tuberculosus*			Southern Widespread	Locally frequently found, on Scrophularia aquatica.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Coelositona cinerascens*	RDB K		Southern Restricted	Infrequently found and very local. According to Hyman & Parsons (1992) this weevil is known as British from a single specimen without data in the Stephens collection in the Natural History Museum (London), however, a population was recently discovered on Canvey Island, South Essex and a single example was swept at Cuckmere Haven in 2005. Phytophagous. The host plant is apparently Slender Bird's-foot Trefoil Lotus tenuis and possibly other Lotus species but the life history remains unknown. Not listed in the Insect Red Data Book (Shirt, 1987).	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Curculio glandium*			Southern Restricted	Commonly found, on oak	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Datonychus melanostictus*			Southern Restricted	Commonly found, on Water Mint Mentha aquatica	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Dorytomus rufatus*			Universal	Commonly found, on willows Salix species	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Dorytomus taeniatus*			Universal	Commonly found, on willows Salix species	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Euophryum confine*			Southern Widespread	Commonly found. Breeds in dead wood, a native of New Zealand	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Glocianus distinctus*			Southern Widespread	Frequently found. On hawkweed Hieracium and hawkbit Leontodon	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Gymnetron villosulum*	Nationally Scarce b		Southern Restricted	Infrequently found and local. A wetland species, associated with pink water-speedwell Veronica catenata and blue water-speedwell Veronica scutellata. The larvae develop in galls on the flower-heads of the foodplants.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hadroplontus litura*			Southern Widespread	Commonly found, on thistles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera fuscocinerea*	Nationally Scarce b		Southern Widespread	Infrequently found in dry grassland. Associated with Medicago species.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera meles*	Nationally Scarce a		Universal	Frequently found, though formerly uncommon. Associated with Red and White clovers, other Trifolium species and possibly Lucerne and Rest Harows	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera nigrirostris*			Universal	Commonly found, on clover, especially Trifolium pratense	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera plantaginis*			Universal	Commonly found. On various species of Fabaceae	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera postica*			Southern Widespread	Commonly found. Feeds on Fabaceae.	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	1	1	1	1	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera rumicis*			Southern Widespread	Common, on dock Rumex species	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera venusta*			Southern Widespread	Commonly found. Feeds on Fabaceae.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Hypera zoilus*			Universal	Locally frequently found. Feeds on Trifolium species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Kissophagus hederae*	Nationally Scarce b		Southern Widespread	Locally Frequently found. larvae bore into dead Ivy stems	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Larinus planus*	Nationally Scarce b		Southern Restricted	Infrequently found in grassland habitats. Phytophagous. Associated with Creeping Thistle Cirsium arvense, Meadow Thistle C. dissectum, Marsh Thistle C. palustre, Spear Thistle C. vulgare and Musk Thistle Carduus nutans.	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Liophloeus tessulatus*			Universal	Commonly found. Adults often found on Ivy, but larvae feed in the rootstocks of Umbellifers.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Lixus scabricollis*			Southern Restricted	Commonly found. Coastal, recent colonist. Sea Beet	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Magdalis armigera*			Southern Widespread	Locally frequently found. On elm, especially in hedgerows, larvae develop in galleries under the bark.	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mecinus collaris*	Nationally Scarce b		Universal	Locally frequently found. In saltmarshes. Phytophagous. Associated with Sea Plantain Plantago maritima. The larvae develop in galls in the flowering stem, just below the inflorescence. Populations are frequently affected by parasitism.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mecinus janthinus*	Nationally Scarce a		Southern Restricted	First discovered in Britain in 1948, this small bluish weevil has been recorded since 1970 from East Kent, West Kent and South Essex, with older records for Surrey and Middlesex. Found on disturbed ground, grassland and road verges, often on chalky soils. Phytophagous. Associated with Common Toadflax Linaria vulgaris.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mecinus labilis*			Southern Widespread	Locally frequently found. On Plantains.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mecinus pascuorum*			Universal	Commonly found, on Ribwort Plantain Plantago lanceolata	0	1	1	0	0	1	1	1	0	1	0	0	1	1	1	1	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mecinus pyraster*			Universal	Commonly found, on Ribwort Plantain Plantago lanceolata	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	1	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Microplontus campestris*	Nationally Scarce b		Southern Restricted	Frequently found. It occurs in open areas, usually on calcareous soils, the larvae developing in the receptacles of oxeye daisy. Local in southern England and Wales.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mogulones asperifoliarum*			Southern Widespread	Local and infrequently found. Associated with Houndstongue, Cynoglossum officinale.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Mogulones euphorbiae*	Nationally Scarce a		Southern Widespread	Infrequently found. Very local and according to Hyman (1992) recently recorded from only seven widely scattered vice counties in England and Wales, to which West Sussex should be added. However, old records indicate that it was formerly more widespread in Britain as far north as the south of Scotland. Found on sandy or chalky soils. Phytophagous. Mainly associated with forget-me-not Myosotis.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Nedyus quadrimaculatus*			Universal	Commonly found, on Stinging Nettle Urtica dioica.	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Orchestes quercus*			Universal	Commonly found. The larvae mine the leaves of oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Orthochaetes setiger*	Nationally Scarce b		Southern Widespread	Locally frequently found. Associated with sandy or chalky soils, often where the vegetation is short and sparse. Phytophagous and polyphagous. The larvae are leaf miners of a wide variety of herbaceous plants.	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Otiorhynchus aurifer*			Southern Restricted	Infrequently found. A recent arrival to the London area. Larvae feed in the roots of plants, adults on the leaves.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Otiorhynchus dieckmanni*			Southern Restricted	Infrequently found. A recent arrival to the London area. Larvae feed in the roots of plants, adults on the leaves.	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Otiorhynchus ligneus*			Universal	It is a ground-living speices of light soils, especially on the coast. Adults are polyphagous. Widespread, but local, in England and Wales, almost entirely coastal in Scotland.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Otiorhynchus ovatus*			Universal	Frequently found. On sandy soils	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Otiorhynchus rugosostriatus*			Universal	Frequently found. Local in England and Wales, uncommon in Scotland. Parthenogenetic and polyphagous, a minor pest of soft fruit.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Parethelcus pollinarius*			Universal	Commonly found, on Stinging Nettle Urtica dioica	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phloeophthorus rhododactylus*			Southern Widespread	Frequently found, on Broom Cytisus scoparius	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius argentatus*			Universal	Common, on a variety of tree species	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius maculicornis*			Universal	Locally frequently found. On a variety of tree foliage.	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius oblongus*			Universal	Locally frequently found. On a variety of tree foliage.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius pomaceus*			Southern Widespread	Comonly found. On Stinging Nettle Urtica dioica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius pyri*			Universal	Commonly found, on a variety of tree species	0	1	1	0	0	1	1	0	0	0	0	1	0	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius roboretanus*			Southern Widespread	Commonly found, in grassland habitats	0	1	1	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius vespertinus*	Nationally Scarce b		Southern Widespread	Locally frequently found. Coastal. Found amongst herbaceous vegetation in saltmarshes and other coastal habitats. Phytophagous and probably polyphagous, but an association with Artemisia maritima has been suggested	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Phyllobius virideaeris*			Universal	Commonly found. In Grassland habitats.	0	1	1	1	0	1	1	0	0	0	0	1	1	0	0	0	1	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Polydrusus cervinus*			Universal	Commonly found, on a variety of trees and shrubs	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Polydrusus flavipes*			Southern Widespread	Locally frequently found. In open and coppiced broad-leaved woodland. Phytophagous. Associated with oak, aspen, and perhaps other species of deciduous trees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Polydrusus formosus*	Nationally Scarce a		Southern Restricted	Locally frequent. Associated with a variety of deciduous trees in rides and clearings in broad-leaved woodland.	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	1	1
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Polydrusus pulchellus*			Universal	Frequently found. Confined to saltmarsh habitats where it has been associated with Artemisia maritime and Chenopodaceae but it is thought to be polyphagous.	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Pselactus spadix*	Nationally Scarce b		Southern Widespread	Commonly found. Coastal. Phytophagous. A wood-boring species which forms colonies in driftwood and old wooden sea defences.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhamphus oxyacanthae*			Southern Widespread	Commonly found. On Rosaceae.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhamphus pulicarius*			Universal	Commonly found, on willow and birch	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhinocyllus conicus*	Nationally Scarce a		Southern Restricted	Infrequently found. Previously recorded from ten vice counties in southern England in the period before 1970 but greatly declined. Recent increase in frequency of recording. Found in grassland habitats, particularly on calcareous soils. Most records are for coastal sites but it also occurs inland. Phytophagous; associated with Creeping Thistle Cirsium arvense, Marsh Thistle C. palustre, Spear Thistle C. vulgare and Musk Thistle Carduus nutans.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhinoncus pericarpius*			Southern Widespread	Commonly found. On dock Rumex species.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhinoncus perpendicularis*			Southern Widespread	Commonly found. Associated with Polygonaceae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhinusa antirrhini*			Southern Widespread	Commonly found. Usually found inside the flowers of Linaria vulgaris, it is possible that the larvae develop in the flowers.	0	1	1	0	0	1	1	0	0	1	0	0	1	0	1	1	1	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Rhinusa linariae*	Nationally Scarce a		Southern Restricted	Infrequently found and localised. Phytophagous, the larvae develop in root galls on Common Toadflax Linaria vulgaris.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (weevils)	*Scolytus pygmaeus*			Southern Restricted	Only discovered in Britain and previously only known from East Kent. Now (2010) recorded from isolated sites in East Sussex, North Essex and South Essex. Breeds under bark of small elm branches, which then die.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (weevils)	*Scolytus rugulosus*			Southern Widespread	breeds under bark of Pyrus, Prunus and Rosa species	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sibinia arenariae*	Nationally scarce b		Southern widespread	Locally frequently found along the coasts of southern England and parts of Wales. Phytophagous. It is associated with rock spurry Spergularia rupestris, sea spurry Spergularia marina and sand spurry Spergularia rubra.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sirocalodes depressicollis*			Southern Widespread	Locally frequently found. The larvae develop in stem galls of Fumitory.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona cylindricollis*			Southern Widespread	Locally frequently found. Associated with Melilotus.	0	1	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona hispidulus*			Universal	Commonly found, on Trifolium species	0	1	1	1	0	0	0	1	0	0	0	0	1	0	1	1	1	1	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona humeralis*			Universal	Frequently found. Medicago.	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona lepidus*			Universal	Commonly found, on various species of Fabaceae.	0	0	1	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona lineatus*			Universal	Commonly found. On various species of Fabaceae	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona macularius*	Nationally Scarce b		Universal	Infrequently found and very local. Occurs in grassland habitats, particularly on chalky soils. Phytophagous, associated with a variety of leguminous plants including Sainfoin Onobrychis viciifolia, Wild Liquorice Astragalus glycyphyllos, Bird's-foot Trefoil Lotus corniculatus, tare, Vicia and medick Medicago. The larvae feed on the roots and root nodules	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona puncticollis*			Universal	Locally frequently found. Associated with Clovers.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona sulcifrons*			Universal	Locally comonly found. Feeds on Trifolium species.	0	1	1	0	0	1	1	0	0	1	0	0	1	0	1	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Sitona waterhousei*	Nationally Scarce b		Southern Widespread	Infrequently found, Local, Lotus Coastal landslips, sandy grassland	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Strophosoma melanogrammum*			Universal	Commonly found, on a variety of trees and shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tachyerges salicis*			Universal	Commonly found, on willows Salix species	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Trachyphloeus angustisetulus*			Universal	Locally infrequently found. Associated with bare and re-vegetating ground.	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Trachyphloeus aristatus*	Nationally Scarce b		Universal	Locally infrequently found. Associated with grassland, especially on calcareous soils. Phytophagous, probably polyphagous and parthenogenetic. The larvae may feed on plant roots or litter. It has been recorded from the base of Buck's-horn Plantain Plantago coronopus and other species of plantain Plantago.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Trichosirocalus troglodytes*			Universal	Commonly found, on Ribwort Plantain Plantago lanceolata	0	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius breviusculus*			Southern Restricted	Infrequently found and very local. A recent discovery in Britain, currently known from ruderal sites close to the River Thames between London and Canvey Island where it is well established in several places. Also recorded from one site on the Dorset coast. Associated with Melilotus species, possibly preferring White Melilot M. alba.	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius junceus*			Universal	Infrequently found and local In open grassland habitats on light soils. Associated with medicks, e.g., Black Medick Medicago lupulina.	0	1	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius meliloti*			Southern Widespread	Infrequently found and localised. On melilot Melilotus species	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius picirostris*			Universal	Commonly found, on Trifolium species	0	0	1	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius schneideri*	Nationally Scarce b		Southern Restricted	Frequently found, but local. Phytophagous. It is found on calcareous grassland, cliff-tops and shingle beach habitats where its foodplant Kidney Vetch Anthyllis vulneraria grows.	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius squamulatus*	Nationally Scarce b		Southern Restricted	Infrequently found. In grassland habitats on sandy soils, possibly preferring calcareous conditions. Phytophagous, associated with Bird's-foot Trefoil Lotus corniculatus. The larvae develop in the seed pods.	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Tychius stephensi*			Southern Restricted	Locally frequently found. In dry grasslands, associated with Trifolium species.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (weevils)	*Xylocleptes bispinus*			Universal	Locally commonly found. Breeds under the bark of Old Man's Beard Clematis vitalba.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Curculionidae (Weevils)	*Zacladus exiguus*	Nationally Scarce b		Southern Widespread	Locally infrequently found. Associated with the smaller-flowered Cranesbills, especially Cut Leaved and Hedgerow Cranesbill Geranium dissectum and G. pyrenaicum.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Dermestidae	*Anthrenus verbasci*			Universal	Commonly found. In nest litter. Also a household pest.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Drilidae	*Drilus flavescens*	Nationally Scarce a		Southern Restricted	Infrequently found and local. Recent records for only the Isle of Wight, Hampshire, Surrey, Kent and Sussex. Seldom found away from chalk grassland, the larvae feed on snails. The female is flightless.	0	1	1	1	0	1	1	0	0	0	0	1	0	1	0	1	0	0	0	0
150 COLEOPTERA (Beetles)	Dytiscidae (Water Beetles)	*Agabus bipustulatus*			Universal	Commonly found. In a wide variety of freshwater habitats	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Dytiscidae (Water Beetles)	*Hydroporus incognitus*			Southern Widespread	Commonly found in ponds and ditches	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Dytiscidae (Water Beetles)	*Hydroporus palustris*			Universal	Commonly found. In a variety of freshwater habitats	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Dytiscidae (Water Beetles)	*Liopterus haemorrhoidalis*			Southern Widespread	Frequently found but local. In well vegetated ponds and ditches	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Dytiscidae (Water Beetles)	*Rhantus frontalis*	Nationally Scarce b		Universal	Infrequently found. Freshwater ditches in a variety of situations.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Agriotes lineatus*			Universal	Commonly found. In grassland habitats	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Agriotes sputator*			Southern Widespread	Commonly found, in grassland habitats	0	1	1	1	1	1	1	0	0	0	0	1	0	1	1	1	0	1	1	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Agrypnus murinus*			Southern Widespread	Commonly found in dry grassland	0	1	1	0	0	0	1	0	0	0	0	1	0	1	1	0	0	1	1	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Athous bicolor*			Southern Widespread	Commonly found, in dry grassland habitats	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Athous campyloides*	Nationally Scarce b		Southern Restricted	Most records for this local click beetle are for South-east England. Adults are active at dusk for a short period in June and July. The wireworm larvae feed on plant roots. The species appears to be spreading in Britain.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Athous haemorrhoidalis*			Universal	Commonly found. In grassland and woodland edge habitats.	0	0	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Denticollis linearis*			Universal	Commonly found, in woodland habitats.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Hemicrepidius hirtus*			Universal	Commonly found. In grasslands.	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Elateridae (Click Beetles)	*Melanotus villosus s. l.*			N/A	Records made under the assumed synonym of Melanotus villosus are now considered to be attributable to a pair of species. M. castanipes & M. villosus	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Geotrupidae	*Typhaeus typhoeus*			Southern Widespread	Locally frequently found, in dung (mainly rabbit) on sandy soils.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Gyrinidae (Whirligig Beetles)	*Gyrinus caspius*			Universal	Commonly found. On the surface of open water, often coastal.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Gyrinidae (Whirligig Beetles)	*Gyrinus substriatus*			Universal	Commonly found. In a variety of freshwater habitats	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Hydraenidae	*Hydraena testacea*			Universal	Commonly found. Aquatic.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Hydrophilidae	*Enochrus halophilus*	Nationally Scarce a		Southern Restricted	Very local and infrequently found. Confined to brackish water habitats in saltmarshes and on coastal grazing marshes in southern England.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Hydrophilidae	*Helophorus aequalis*			Southern Widespread	Commonly found in a variety of freshwater bodies.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Hydrophilidae	*Helophorus alternans*	Nationally Scarce		Southern Widespread	Infrequently found. In fresh water habitats.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Hydrophilidae	*Megasternum concinnum*			Universal	Commonly found	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	1	0
150 COLEOPTERA (Beetles)	Kateretidae	*Brachypterolus linariae*			Southern Widespread	Commonly found. Breeds in the flowers of Linaria species.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Kateretidae	*Brachypterolus pulicarius*			Universal	Frequently found. Associated with the flowers and seeds of Toadflax, Linum spp..	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Kateretidae	*Brachypterolus vestitus*			Southern Restricted	Locally frequently found, most often on flowers of cultivated Antirrhinum.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Kateretidae	*Brachypterus glaber*			Universal	Commonly found on stinging nettles.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Kateretidae	*Brachypterus urticae*			Universal	Commonly found on stinging nettles.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Lathridiidae	*Cartodere bifasciata*			Universal	Very commonly found. Associated with decaying vegetable material.	0	0	0	0	0	0	1	1	0	1	0	1	0	0	1	1	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Cartodere nodifer*			Universal	Commonly found. Associated with mould or fungus on dry wood.	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Corticaria impressa*			Universal	Commonly found. In vegetation litter.	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Corticarina fuscula*			Universal	Commonly found, in a variety of habitats.	0	0	1	0	0	0	1	0	0	1	1	0	0	0	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Cortinicara gibbosa*			Universal	Commonly found, in a variety of habitats	0	0	0	1	0	1	1	0	0	1	0	0	0	1	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Enicmus brevicornis*	Nationally Scarce		Southern Widespread	Infrequently found. Becoming commoner. Often associated with Sycamore with sooty-bark disease.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Enicmus histrio*			Universal	Frequently found, but local. In decaying vegetable material.	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Melanophthalma suturalis*			Universal	Infrequently found and local. Associated with wetland habitats	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Lathridiidae	*Melanophthalma suturalis*			Southern Restricted	Frequently found. Associated with wetlands.																				
150 COLEOPTERA (Beetles)	Leiodidae	*Catops nigricans*			Universal	Commonly found. Mainly on carrion.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Melyridae	*Anthocomus fasciatus*			Southern Widespread	Locally frequently found. Larvae predatory, probably in plant stems, adults on flowers.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Melyridae	*Anthocomus rufus*			Southern Restricted	Commonly found. Reed Beds	0	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Melyridae	*Axinotarsus marginalis*			Southern Restricted	Commonly found. In grassland and woodland edge habitats	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Melyridae	*Cordylepherus viridis*			Southern Restricted	Frequently found, in dry grassland	0	1	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Melyridae	*Dasytes aeratus*			Southern Widespread	Commonly found, on flowers in woods and hedgerows	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Melyridae	*Dasytes plumbeus*			Southern Restricted	Commonly found on flowers in hedges.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Melyridae	*Malachius bipustulatus*			Southern Widespread	Commonly found, on flowers in grassland and woodland.	0	1	0	1	0	1	1	1	0	1	1	0	0	1	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellistena acuticollis*	RDB K		Southern Restricted	Infrequently found. Probably a recent colonist in Britain, this species was first recorded from Eriswell Lode near Mildenhall, West Suffolk and Shooter's Hill, West Kent in 1983 and 1984 respectively. It has recently been recorded from most counties in south-east England and East Anglia. Phytophagous. Associated with Mugwort Artemisia vulgaris, the larvae probably develop in the stems.	0	1	1	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellistena neuwaldeggiana*	RDB K		Southern Restricted	Infrequently found. Very local in southern England and only recently (1970 onwards) recorded from a few counties. Due to confusion with closely related species, the current status and distribution is uncertain. Occurs in or at the edges of woodland and pasture woodland. The larvae are stated to develop either in dead wood or plant stems, probably the latter	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellistena pseudoparvula*	RDB K		Southern Restricted	Infrequently fond. Recently recognised as a distinct species. Breeds in stems of thistle.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellistena pumila*			Southern Restricted	Frequently found, on a variety of flowers	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	0	0	1	1	0

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150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellistena variegata*			Southern Restricted	Locally frequently found. Adults found on flowers of hogweed and other species of umbels. Larval host uncertain but probably develop in plant stems.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Mordellochroa abdominalis*			Southern Widespread	Frequently found, but local. Adults occur on flowers and larvae probably develop in dead wood or plant stems.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Mordellidae (Tumbling Flower Beetles)	*Variimorda villosa*	Nationally Scarce b		Southern Widespread	Infrequently found. The larvae probably develop in rotting wood, and adults occur on flowers. A local species of southern England.	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Mycetophagidae	*Litargus connexus*			Southern Widespread	Frequently found. Under bark on dead trees where it feeds on fungi.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Epuraea aestiva*			Universal	Commonly found, on a variety of flowers	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	1	1	1	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes aeneus*			Universal	Commonly found. Breeds in flowers of Brassicaceae.	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes carinulatus*			Southern Widespread	Frequently found on Bird's-foot Trefoil Lotus corniculatus	0	1	0	0	0	0	1	0	0	0	1	1	0	1	1	0	0	1	0	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes flavimanus*			Universal	Frequently found. Associated with hedgerows and scrub. On flowers of Rosacae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes planiusculus*			Southern Widespread	on Viper's Bugloss Echium vulgare	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes rotundicollis*	Nationally Scarce		Southern Restricted	Infrequently found and very local. Larvae feed on Sinapis arvensis and Sisymbrium officinale (Brassicacaea).	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Meligethes ruficornis*			Southern Widespread	Infrequently found and localised. Breeds in flowers of Ballota nigra	0	1	0	0	0	1	1	0	0	1	0	0	1	1	0	0	0	1	0	0

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150 COLEOPTERA (Beetles)	Nitidulidae (Pollen Beetles)	*Pria dulcamarae*			Southern Widespread	Commonly found. Associated with Solanum dulcamara and S. nigrum. Breeds in the flowers.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Oedemeridae	*Ischnomera cyanea*	Nationally Scarce b		Southern Widespread	Frequently found. Two species (I. caerulea and I. cyanea) were previously confused in Britain under the name I. Caerulea. I. cyanea is by far the most frequent and is widely distributed though local in England and Wales. Found mainly in ancient broad-leaved woodland, pasture-woodland and old hedgerows. Adults frequently visit flowers, including hawthorn and Hogweed. The larvae develop in dead wood of a variety of tree species.	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Oedemeridae	*Oedemera lurida*			Southern Widespread	Commonly found. On a variety of flowers.	0	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
150 COLEOPTERA (Beetles)	Oedemeridae	*Oedemera nobilis*			Southern Widespread	Commonly found. On a variety of flowers	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
150 COLEOPTERA (Beetles)	Phalacridae	*Olibrus aeneus*			Universal	Commonly found, on mayweeds and related species	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Phalacridae	*Olibrus corticalis*			Southern Restricted	Locally frquently found. On flowers of Wood Groundsel.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Phalacridae	*Olibrus flavicornis*	RDB K		Southern Restricted	Commonly found. It is said to be associated with Leontodon autumnalis (smooth hawkbit) but my records are all for Picris hieracioides (hawkweed ox-tongue). Adults feed on pollen and the larvae develop in the flower head. There are recent records for the Thames estuary, Darenth, Kent and the coasts of East and West Sussex.	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	0	0	0	1
150 COLEOPTERA (Beetles)	Phalacridae	*Olibrus millefolii*	Nationally Scarce b		Southern Restricted	Infrequently found. Very local. Associated with Yarrow growing in dry grasslands. The larvae develop in the flower heads.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Phalacridae	*Phalacrus caricis*			Universal	Locally frequently found. Associated with wetland habitats. Breeds on smutted Carex	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Phalacridae	*Phalacrus fimetarius*			Universal	Commonly found. In dung and leaf litter.	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Pyrochroidae (Cardinal Beetles)	*Pyrochroa coccinea*	Nationally Scarce b		Southern Restricted	Infrequently found. Associated with hardwood timber where the larvae prey on other invertebrates under the bark.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Pyrochroidae (Cardinal Beetles)	*Pyrochroa serraticornis*			Southern Widespread	Frequently found. The larvae are predatory under the bark of fallen trees in shady woodland.	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Involvulus caeruleus*			Southern Restricted	Commonly found. On rosaceous shrubs, especially hawthorn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Lasiorhynchites olivaceus*	Nationally Scarce a		Southern Restricted	Infrequently found, local. The larvae feed in 1-year old twigs of oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Neocoenorrhinus germanicus*			Universal	Common, on various herbaceous & shrubby Rosaceae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Tatianaerhynchites aequatus*			Universal	Commonly found. Feeds on hawthorn.	0	1	1	0	0	0	1	0	0	1	1	1	0	1	1	1	0	0	1	0
150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Temnocerus longiceps*	Nationally Scarce b		Universal	Frequently found in broad-leaved woodland, especially in damp situations. Phytophagous. Associated mainly with Goat Willow but possibly also with birch and other Salix species. The larvae develop in the leaf buds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Rhynchitidae (Weevils)	*Temnocerus tomentosus*	Nationally Scarce b		Southern Widespread	It occurs on various species of sallow and poplar, the larvae developing in the leaf buds. Local but widely distributed in England and Wales.	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Salpingidae	*Salpingus planirostris*			Universal	Commonly found, on dead twigs	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Scarabaeidae (Dung Beetles and Chafers)	*Amphimallon solstitialis*			Southern Widespread	The Summer Chafer. Locally commonly found, especially in coastal districts. The larvae feed on the roots of various herbaceous species. Light, sandy soils.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Scarabaeidae (Dung Beetles and Chafers)	*Hoplia philanthus*			Southern Widespread	Locally frequently found, in acidic grassland	0	0	1	1	0	1	1	0	0	1	0	1	0	1	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Scarabaeidae (Dung Beetles and Chafers)	*Onthophagus coenobita*			Southern Widespread	Frequently found. In dung, occasionally in carrion or decaying fungi	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scarabaeidae (Dung Beetles and Chafers)	*Onthophagus joannae*			Universal	Frequently found. In dung on light soils.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Scarabaeidae (Dung Beetles and Chafers)	*Serica brunnea*			Universal	Frequently found- most often in traps, when it can be abundant. Night flying with a subterranean larva. Especially light soils	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scirtidae	*Cyphon coarctatus*			Universal	Commonly found, in wetland habitats; larvae are aquatic	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0

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150 COLEOPTERA (Beetles)	Scirtidae	*Cyphon laevipennis*			Universal	Commonly found. Associated with Phragmites beds.	0	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scirtidae	*Cyphon ochraceus*			Universal	Commonly found. Larvae are aquatic.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scirtidae	*Microcara testacea*			Universal	Commonly found. In wetland habitats, larvae are aquatic	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scirtidae	*Scirtes hemisphaericus*			Southern Widespread	Locally frequently found. Adults on emergent wetland vegetation, larvae are aquatic	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scraptiidae	*Anaspis costai*			Southern Restricted	Infrequently found and very local. In woodland	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scraptiidae	*Anaspis fasciata*			Universal	Commonly found. Scarcer towards the northern limit of its range (Clyde) Adults on flowers. Has been reared from fallen oak branches.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Scraptiidae	*Anaspis maculata*			Universal	Commonly found, on a variety of flowers. Possibly breeds in dead wood.	0	0	0	1	0	1	1	0	0	1	0	1	0	1	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Scraptiidae	*Anaspis pulicaria*			Southern Widespread	Commonly found, on a variety of flowers.	0	1	1	1	0	0	1	1	0	1	1	1	0	1	0	1	0	1	0	0
150 COLEOPTERA (Beetles)	Scraptiidae	*Anaspis regimbarti*			Universal	Commonly found, on a variety of flowers. Possibly breeds in dead wood.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Silphidae (Sexton Beetles)	*Aclypea opaca*	Nationally Scarce a		Southern Widespread	Infrequently found. Associated with Chenopodaceae, probably feeding on the roots. Disturbed ground.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Silphidae (Sexton Beetles)	*Nicrophorus interruptus*	Nationally Scarce b		Southern Restricted	Frequently found. Highly mobile and not habitat specific but requires a ready supply of carrion.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Silphidae (Sexton Beetles)	*Silpha atrata*			Universal	Commonly found. Decaying logs and in grass tussocks.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Silphidae (Sexton Beetles)	*Silpha laevigata*			Universal	Local but frequently found. In carrion.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0
150 COLEOPTERA (Beetles)	Silphidae (Sexton Beetles)	*Silpha tristis*			Universal	Local but frequently found. In carrion.	0	0	1	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Aleochara bipustulata*			Universal	Commonly found. In dung, the larvae prey on the larvae of Anthomyidae (Diptera)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Aleochara brevipennis*	Nationally Scarce		Universal	Infrequently found. A declining species since the middle of the 20th Century. Associated with edges of waterbodies and marshland. A predator on the larvae of Diptera	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Alianta incana*			Southern Widespread	Locally frequently found. Associated with litter in reed beds.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Aloconota sulcifrons*			Universal	Commonly found. At margins of water-bodies.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anotylus hamatus*	Nationally Scarce		Southern Restricted	Infrequently found. Very local. Associated with dung	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anotylus inustus*			Southern Widespread	Commonly found, amongst litter on the ground	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anotylus rugosus*			Universal	Very commonly found. In decaying vegetable litter.	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anotylus sculpturatus*			Southern Widespread	Very commonly found, amongst litter on the ground.	0	0	0	1	1	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anotylus tetracarinatus*			Universal	Commonly found. Biology unknown	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Anthobium unicolor*			Universal		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Astenus lyonessius*			Southern Widespread	Commonly found. Amongst leaf litter in open-structured grassland.	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Atheta crassicornis*			Universal	Commonly found. A wetland species.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Atheta graminicola*			Universal	Commonly found. A wetland species.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Bisnius fimetarius*			Universal	Commonly found. Associated with decaying vegetation.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Brachygluta helferi*			Southern Widespread	Frequently found, amongst litter in saltmarshes. Assumed to be a predator.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Carpelimus manchuricus*			Universal	Frequently found. On fine silt beside water-bodies	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Carpelimus zealandicus*			Universal	Frequently found. An introduction from New Zealand. On damp, sparsely-vegetated areas, coastal and riverine.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Cypha longicornis*			Universal	Commonly found, amongst litter on the ground	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Dimetrota nigripes*			Universal	Commonly found. Often in carrion.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Drusilla canaliculata*			Southern Widespread	Commonly found, in dry grassland habitats	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Falagrioma thoracica*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Lesteva longoelytrata*			Universal	Commonly found. In wetlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Lithocharis nigriceps*			Southern Widespread	Commonly found. Introduced from eastern Asia	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Megalinus glabratus*			Universal	Commonly found	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Metopsia clypeata*			Universal	Commonly found. In moss and ground litter. Life history unknown.	0	0	1	0	0	0	1	0	0	1	1	0	1	1	0	0	0	1	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Micropeplus staphylinoides*			Universal	Frequently found. In litter.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Mycetota laticollis*			Universal	Commonly found. In decaying vegetable matter.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Ocypus brunnipes*			Universal		0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Ocypus olens*			Universal	Common, in carrion, etc.	0	0	0	0	1	0	1	0	0	0	0	1	1	1	0	1	0	1	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Omalium caesum*			Universal	Commonly found. In litter	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Omalium excavatum*			Universal	Commonly found, but local. In litter	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Othius laeviusculus*			Universal	Frequently found.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Othius punctulatus*			Universal	Commonly found. No data available.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Oxypoda elongatula*			Universal	Commonly found. In wetlands.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Oxypoda opaca*			Universal	Commonly found. In rotting vegetation	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Paederus riparius*			Southern Widespread	Commonly found. in wetland habitats	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philhygra luridipennis*			Universal	Commonly found, often on river-banks	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus cognatus*			Universal	Commonly found in grassland habitats	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus debilis*			Universal	Frequently found. Associated with rotting vegetation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus decorus*			Universal	Commonly found. In damp woodland amongst moss and leaf litter.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus marginatus*			Universal	Commonly found. In dung and rotting vegetation.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus micans*			Southern Widespread	Commonly found. In wetlands	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus punctus*			Southern Restricted	Locally frequently found, especially Thames Estuary. In wetlands which are intermittently flooded.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus quisquiliarius*			Universal	Commonly found in wetland habitats, often at the edges of water amongst vegetation litter.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus spinipes*			Southern Restricted	Frequently found. A new colonist. Associated with rotting vegetation	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus succicola*			Universal	Commonly found. Often in carrion.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Philonthus tenuicornis*			Universal	in dung	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Platydracus stercorarius*			Southern Widespread	Commonly found. Associated with carrion and dung	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Platystethus capito*			Southern Restricted	Infrequently found. Associated with sparsely vegetated chalk or limestone.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Platystethus nitens*			Southern Widespread	Frequently found. Wetlands, especially the margins of water-bodies.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Pselaphus heisei*			Universal	Commonly found. In litter.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius curtipennis*			Universal		0	0	0	1	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius fuliginosus*			Universal	Commonly found. Little known about its autecology.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius fumatus*			Universal	Frequently found. In leaf litter in woodland.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius inverae*			Universal	Locally frequently found. Possibly associated with wasp nests.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius levicollis*			Universal	Commonly found. In litter	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0

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150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius maurorufus*			Universal	Commonly found. In wetland habitats. Little known about its autecology.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius molochinus*			Universal		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius persimilis*			Universal	Commonly found. Open habitats on dry soils.	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius picipes*			Universal	Frequently found. Wetlands.	0	0	0	1	1	0	1	1	0	1	1	0	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius semiobscurus*			Universal	Commonly found. On open, warm areas with sparse vegetation.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius simplicifrons*			Southern Widespread	Locally frequently found. A coastal species of the upper saltmarsh zone.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Quedius umbrinus*			Universal	Commonly found. In a wide range of damp habitats.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Rugilus angustatus*	Nationally Scarce		Southern Restricted	Infrequently found. In vegetation litter.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Rugilus rufipes*			Universal	Commonly found. Variety of habitats.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Scaphisoma agaricinum*			Southern Widespread	Locally frequently found. Breeds under bark of fungoid wood.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Sepedophilus littoreus*			Universal	Commonly found. Under bark of rotting logs, in association with fungus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Sepedophilus marshami*			Universal	Commonly found. In a variety of habitats	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Sepedophilus nigripennis*			Universal	Commonly found, amongst litter on the ground	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus aceris*			Southern Widespread	Commonly found, but scarer in the north. At roots of grass and in moss in both grassland and woodland habitats, chiefly in lowland situations.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus bimaculatus*			Universal	Commonly found. Wetlands	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus brunnipes*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus clavicornis*			Universal	Commonly found. In open habitats on all soil types	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus fulvicornis*			Universal	Commonly found, in wetland habitats	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

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150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus juno*			Universal	Commonly found	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus ossium*			Universal	Commonly found	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Stenus similis*			Universal	Commonly found. In dry grassland habitats.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Sunius propinquus*			Southern Widespread	Commonly found. Open and disturbed ground.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachinus flavolimbatus*	RDB K		Southern Restricted	Locally frequently found. Confined to East Anglia and the north coast of Kent. Infrequent. In litter and decaying matter. Open habitats from saltmarsh to grassland and synanthropic sites.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachinus marginellus*			Universal	Commonly found. In litter.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachinus rufipes*			Universal	Commonly found. In decomposing vegetable matter.	0	0	0	1	1	0	1	1	0	1	0	0	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachyporus atriceps*			Universal	Commonly found. In grasslands amongst leaf litter and mosses.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachyporus chrysomelinus*			Universal	Commonly found.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachyporus hypnorum*			Universal	Commonly found, amongst litter on the ground.	0	1	0	0	0	1	1	0	0	1	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tachyporus nitidulus*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasgius globulifer*			Southern Widespread		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasgius morsitans*			Universal	Infrequently found, very local. In dry grassland and stoney ruderal habitats.	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasgius pedator*			Southern Widespread	Frequently found. Local. At the base of plants and under stones.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasgius winkleri*			Universal	Commonly found. Associated with bare and re-vegetating ground.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasgius winkleri*			Universal	Commonly found. On open, warm areas with sparse vegetation.																				
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Tasigus melanarius*			Universal	Commonly found. In ground layer of a range of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Xantholinus elegans*			Southern Widespread	Commonly found. Associated with open, sparsely-vegetated areas.	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Xantholinus elegans*			Southern Widespread	Commonly found. Associated with open, sparsely-vegetated areas.																				
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Xantholinus linearis*			Universal	Commonly found. Associated with open, sparsely-vegetated areas.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0
150 COLEOPTERA (Beetles)	Staphylinidae (Rove Beetles)	*Xantholinus longiventris*			Universal	Frequently found.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Tenebrionidae	*Isomira murina*			Southern Widespread	Commonly found. In dry grassland	0	1	1	1	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Tenebrionidae	*Lagria hirta*			Universal	Commonly found. Associated with hedgerows and scrub.	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0
150 COLEOPTERA (Beetles)	Tenebrionidae (Darkling Beetles)	*Nacerdes melanura*			Universal	Commonly found. The Wharf-borer. Coastal. Breeds in old timber and driftwood along the shoreline	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Throscidae	*Trixagus dermestoides*			Universal	Data not availalble	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Throscidae	*Trixagus gracillis*	RDB 3		Southern Restricted	Infrequently found. Very local, coastal areas. At the roots of grasses on sparsely vegetated ground.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Throscidae	*Trixagus obtusus*			Southern Restricted	Data not available	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
150 COLEOPTERA (Beetles)	Throscidae (False Click Beetles)	*Trixagus carinifrons*			Southern Widespread	Locally frequently found. The larvae are thought to develop in dead wood.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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150 COLEOPTERA (Beetles)	Urodontidae	*Bruchela rufipes*	RDB 3		Southern Restricted	Infrequently found. This species has recently become naturalised in southern England. It is currently very local and was first noted in 1984 when a colony was found on the old gas works site at Beckton in East London. It was found at Thamesmead on the south bank of the River Thames in 1990 and at another site in South-east London in 1996. More recently there have been records from Surrey and the East Anglian Breck district. It is associated with Wild Mignonette Reseda lutea.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
150 COLEOPTERA (Beetles)150 COLEOPTERA (Beetles)	Apionidae (Weevils)	*Apion frumentarium*			Universal	Commonly found, on dock Rumex	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
160 DIPTERA (Flies)	Acroceridae	*Paracrocera orbiculata*			Southern Widespread	Infrequently found although occasionally locally common, possibly due to mass emergence. The larva is a parasite of spiders.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Anthomyiidae	*Egle rhinotmeta*			Universal	No data	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Anthomyiidae	*Leucophora obtusa*			Universal	Locally frequently found. The larvae are cleptoparasitic in the nests of soil-nesting aculeate Hymenoptera.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Anthomyiidae	*Leucophora personata*			Southern Restricted	Frequently found and local. The larvae are cleptoparasites of aculeate Hymenoptera.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Anthomyiidae	*Pegoplata juvenilis*			Universal	Commonly found.The larvae develop in animal dung.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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160 DIPTERA (Flies)	Asilidae (Robberflies)	*Dioctria atricapilla*			Southern Widespread	Commonly found. Dry, grassy areas and heaths.	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Dioctria baumhaueri*			Southern Widespread	Commonly found. Dry, grassy areas and heaths at the edge of woodland.	0	1	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Dioctria linearis*			Southern Restricted	Frequently found. Open woodland. The larvae are predatory in the soil.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Dioctria rufipes*			Universal	Frequently found. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.	0	1	1	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Dysmachus trigonus*			Universal.	Locally commonly found. On heaths and dry, sandy grasslands in southern England. Coastal sand-dunes further north.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Leptogaster cylindrica*			Southern Widespread.	Frequently found in long grass. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.	0	1	1	0	0	1	1	1	0	1	0	0	1	1	0	1	1	1	1	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Machimus atricapillus*			Southern Widespread	Commonly found. Dry grasslands and scrub.	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Asilidae (Robberflies)	*Machimus cingulatus*			Southern Widespread	Commonly found south of London, infrequent elsewhere. Dry grasslands, heaths and scrub.	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Bibionidae (St Mark's Flies)	*Bibio anglicus*			Southern Restricted	Frequently found. The larvae feed in grassland.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Bibionidae (St Mark's Flies)	*Bibio johannis*			Universal	Very commonly found. The larvae feed in grassland.	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Bibionidae (St Mark's Flies)	*Bibio leucopterus*			Southern Restricted	Frequently found. The larvae feed in grassland.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Bibionidae (St Mark's Flies)	*Bibio marci*			Southern Widespread	Commonly found. The larvae feed in grassland.	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0
160 DIPTERA (Flies)	Bibionidae (St Mark's Flies)	*Dilophus febrilis*			Universal	Very commonly found. The larvae feed in grassland.	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0

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160 DIPTERA (Flies)	Bombyliidae (Beeflies)	*Bombylius major*			Southern Widespread	Commonly found. A cleptoparasite of a variety of springtime ground-nesting solitary bees.	0	1	0	1	0	1	1	0	0	1	0	1	0	1	1	1	1	1	1	0
160 DIPTERA (Flies)	Calliphoridae (Blue and Greenbottle Flies)	*Cynomya mortuorum*			Universal	Frequently found. The larvae develop in carrion. A species of open habitats, more frequent in the north and west.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Calliphoridae (Blue and Greenbottle Flies)	*Melanomya nana*			Universal	Commonly found.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Cecidiomyiidae	*Craneiobia corni*			Universal	Commonly found. Makes galls on the leaves of Dogwood.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Cecidiomyiidae	*Jaapiella veronicae*			Universal	Commonly found. Larvae gall Germander Speedwell.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Cecidiomyiidae	*Kiefferia pericarpiicola*			Southern Widespread	Very few records. Larvae in galls on seeds of umbellifers.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Chloropidae	*Chlorops pumilionis*			Universal	Frequently found. The larvae feed in the stems of grasses.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Chloropidae	*Eurina lurida*	pRDB3		Southern Restricted	Infrequently found. Associated with reed beds on coastal marshes	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Chloropidae	*Lipara lucens*			Southern Widespread	Commonly found. The larvae gall the flowering stem of Common Reed, making a cigar-gall.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Chloropidae	*Platycephala planifrons*			Southern Widespread	Commonly found. The larvae develop in stems of common reed.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Conops ceriaeformis*			Southern Restricted	Infrequently found. The larvae are internal parasites of bees and wasps.	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Conops flavipes*			Universal	Commonly found. The larvae are internal parasites on bumble bees and social wasps.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Conops quadrifasciatus*			Universal	Commonly found. A parasite of bumble bee workers.	0	1	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0

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160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Myopa buccata*			Universal	Infrequently found. The larvae are internal parasites of solitary bees of the genus Andrena.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Myopa strandi*	RDB 3		Southern Restricted	Rarely found. The larvae are internal parasites of solitary bees of the genus Andrena.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Myopa testacea*			Universal	Infrequently found. The larvae are internal parasites of solitary bees of the genus Andrena.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Physocephala rufipes*			Southern Widespread	Frequently found. A parasite of bumble bees.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Sicus ferrugineus*			Universal	Commonly found. A parasite of bumble bee workers.	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	0	0	1	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Thecophora atra*			Southern Widespread	Frequently found. Easily overlooked. It is most often swept from around the burrows of solitary bees of the genera Halictus and Lasioglossum, which are its hosts.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Conopidae (Thick-headed Flies)	*Zodion cinereum*	Nationally Scarce b		Southern Widespread	Rarely found. A parasitoid of adult bees	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Argyra argyria*			Universal	Commonly found. In wetlands.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus diadema*			Southern Widespread	Frequently found. Associated with the margins of saltmarsh.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus festivus*			Universal	Commonly found.	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus griseipennis*			Universal	Frequently found.	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus nubilus*			Universal	Commonly found	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus signifer*	Nationally Scarce b		Southern Restricted	Frequently found. Associated with the margins of fresh and brackish water bodies	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Dolichopus virgultorum*	Nationally Scarce		Southern Restricted	Infrequently found. Probably breeds in mud and the larvae are predatory. Not a scarce as its status suggests.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Machaerium maritimae*			Universal	Commonly found. Saltmarshes	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Dolichopodidae	*Poecilobothrus nobilitatus*			Southern Widespread	Commonly found in the southern half of Britain. The adults can be very conspicuous at the edges of ponds. The larvae are predatory in mud.	0	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Poecilobothrus principalis*			Southern Restricted	Frequently found. Coastal levels and salt marsh. The adults can be very conspicuous at the edges of water-bodies. The larvae are predatory in mud.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Dolichopodidae	*Scellus notatus*			Universal	Frequently found. Local, in woodland and scrub.	0	1	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis caudatula*			Universal	Commonly found. Associated with short and medium height grasslands.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis livida*			Universal	Commonly found. The larvae and adults are predatory.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis nigritarsis*			Southern Restricted	No data	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis nuntia*			Universal	Commonly found. Details of biology unknown.	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis scutellata*			Southern Widespread	Commonly found. Both adults and larvae are predatory.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis tessellata*			Universal	Commonly found. Both adults and larvae are predatory.	0	1	0	0	1	1	1	0	0	1	0	0	0	1	1	0	0	1	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis trigramma*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Empis woodi*	Nationally Scarce		Southern Restricted	Infrequently found. Biology unknown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Empididae (Dance Flies)	*Rhamphomyia atra*			Southern Widespread	Frequently found, although local. Associated with calcareous grassland/scrub systems.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Ephydridae	*Ephydra riparia*			Universal	Commonly found. A coastal species, the larvae are in organically-rich waters.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Ephydridae	*Notiphila nubila*			Southern Restricted	No data	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Fanniidae	*Fannia manicata*			Universal	No data	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Hybotidae	*Drapetis exilis*			Southern Restricted	No data	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Hybotidae	*Platypalpus leucocephalus*			Southern Widespread	No further data available	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Hybotidae	*Platypalpus pictitarsis*			Southern Widespread	No data	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Hybotidae	*Tachydromia umbrarum*			Southern Widespread	Frequently found. Often on tree trunks	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Lauxaniidae	*Minettia longipennis*			Universal	Commonly found. The larvae breed in decaying vegetable matter.	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Austrolimnophila ochracea*			Universal	Commonly found. A woodland species. Breeds in dead wood.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia affinis*			Universal	A recently recognised species. Largely restricted to heaths and moors.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia chorea*			Universal	Commonly found. Wide variety of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia danica*	RDB 3		Southern Restricted	Infrequently found. Associated with mildly brackish conditions. The larvae live in wet, sparsely vegetated mud.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia lutea*			unknown	A newly recognised species. Biology unknown.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia modesta*			Universal	Commonly found. Associated with damp, shady woodlands.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Dicranomyia morio*			? Universal	Infrequently found. Associated with marshes and slow-flowing ditches.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Epiphragma ocellare*			Universal	Frequently found in wet woodland. The larva feeds in dead wood, mainly in long established woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Erioconopa trivialis*			Universal	Commonly found. The larvae live in wet mud.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Erioptera lutea*			Universal	Commonly found. The larvae live in wet mud.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Helius longirostris*			Universal	Frequently found. Associated with weedy ponds and bogs. The larva is aquatic.	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Ilisia maculata*			Universal.	Commonly found.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Limonia flavipes*			Universal	Commonly found. Associated with calcareous woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Limonia masoni*	RDB 3		Universal	Rarely found. Usually associated with the edges of damp calcareous woodland	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Limonia nigropuncta*			Universal	Frequently found. Calcareous woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Limonia nubeculosa*			Universal	Commonly found. Damp woodlands. The larvae feed in dead wood.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Limonia phragmitidis*			Universal	Commonly found. Woodland.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Molophilus obscurus*			Universal	Commonly found. Open fen.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Molophilus occultus*			Universal	Commonly found. Associated with bogs, and wet acidic woodland.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Molophilus ochraceus*			Universal	Commonly found. Wet woodland.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Molophilus pleuralis*			Universal	Infrequently found. Associated with brackish marshland.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Ormosia hederae*			Universal	Locally frequent. Wet woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Phylidorea ferruginea*			Universal	Commonly found. Wet woodland.	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Rhipidia maculata*			Universal	Commonly found. Open habitats. The larvae breed in rotting vegetation and cow dung.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Symplecta hybrida*			Universal	Infrequently found. Associated with basic and neutral wet meadows and fen.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Limoniidae (Craneflies)	*Symplecta stictica*			Universal	Commonly found, especially associated with marshy coasts.	0	1	1	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0

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160 DIPTERA (Flies)	Lonchopteridae	*Lonchoptera lutea*			Universal	Commonly found. The larvae occur amongst dead leaves and decaying vegetable matter.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Micropezidae	*Micropeza corrigiolata*			Southern Widespread	The larvae feed on the root nodules of leguminous plants. Fairly widely distributed.	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Muscidae	*Coenosia tigrina*			Universal	Commonly found. The larvae breed in cow dung.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Muscidae	*Eudasyphora cyanella*			Universal	The larvae develop in cow dung. Generally distributed and common.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Muscidae	*Graphomya maculata*			Universal	Commonly found. No data available.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Muscidae	*Helina impuncta*			Universal	Commonly found. The larvae develop in cow dung.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Muscidae	*Mesembrina meridiana*			Universal	Commonly found. The larva lives in dung of cattle and other species.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Opomyzidae	*Geomyza tripunctata*			Universal	Commonly found. The larvae develop in the shoots of grasses. It can be a pest of cereals.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Pallopteridae	*Palloptera modesta*			Universal	Commonly found but local. Associated with seed heads of thistles, but also bark beetle burrows.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Pediciidae	*Tricyphona immaculata*			Universal	Commonly found. The larvae live in wet mud and are predatory.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Platystomatidae	*Platystoma seminationis*			Universal	Commonly found. The larvae develop in decaying vegetable matter in damp places.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Platystomatidae	*Rivellia syngenesiae*			Widespread	Locally frequently found, in wetland habitats	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Ptychopteridae (Craneflies)	*Ptychoptera contaminata*			Southern Widespread	Commonly found. Particularly associated with tall vegetation at the margins of lakes, ponds and ditches.	0	0	0	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0

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160 DIPTERA (Flies)	Rhagionidae	*Chrysopilus asiliformis*			Universal	Frequently found in damp places, particularly marshes and fens.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Rhagionidae	*Chrysopilus cristatus*			Universal	Commonly found in damp places, particularly marshes and fens.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Blaesoxipha plumicornis*	Nationally Scarce b		Southern Restricted	The larvae are parasitoids of grasshoppers. Very local in southern England.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Metopia argyrocephala*			Southern Widespread	Commonly found. The larvae are cleptoparasitic in the nests of aculeate Hymenoptera.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Nyctia halterata*			Southern Restricted	Frequently found. Associated with a range of habitats. It has been suggested that the larva feeds on Lixus weevils (van Emden, 1954)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Sarcophaga crassimargo*			Universal	Commonly found. Larvae are thought to be predators of snails	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Sarcophaga nigriventris*			Universal	There is a preference for open, hot, sparsely vegetated habitats. Larvae have reportedly been reared from dead snails and mice. Widespread and locally common over much of the British Isles.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Sarcophaga vagans*			Universal	Commonly found. The larvae develop in snails.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sarcophagidae (Flesh Flies)	*Sarcophaga variegata*			Universal	Commonly found. The larvae are predators of earthworms.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Scathophagidae	*Norellisoma spinimanum*			Universal	No data	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Scathophagidae	*Scathophaga inquinata*			Universal	Data not available.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

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160 DIPTERA (Flies)	Scathophagidae	*Scathophaga litorea*			Universal	Commonly found. Associated with coastal areas where they are often found on piles of seaweed. Predatory on other Diptera.	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Scathophagidae	*Scathophaga stercoraria*			Universal	Commonly found. The larva breeds in dung of cattle and other species.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Coremacera marginata*			Universal	Frequently found. Associated with dry habitats. The larvae prey on terrestrial snails.	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	0	0	1	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Dichetophora obliterata*			Southern Restricted	frequently found in a variety of habitats.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Elgiva cucularia*			Universal	Frequently found in a variety of wetland habitats. The larvae prey on aquatic pulmonate snails	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Elgiva solicita*			Universal, but rare in Scotland.	Frequently found in a variety of wetland habitats. The larvae feed on aquatic pulmonate snails.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Elgivia cucularia*			Universal	Frequently found. Associated with marshy areas and margins of water bodies. Larvae develop in aquatic snails.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Limnia unguicornis*			Universal	Commonly found in both wet and dry grassland.	0	1	1	1	0	1	1	0	0	0	0	0	0	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Pherbellia cinerella*			Universal	Commonly found in grassland.	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Pherbellia dorsata*	Nationally Scarce		Southern Restricted	Infrequently found. Associated with marshy areas and margins of water bodies. Larvae develop in aquatic snails.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Pherbina coryleti*			Universal	Frequently found. Associated with a variety of wet habitats. The larvae prey on both aquatic and terrestrial snails.	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Sepedon sphegea*			Universal	Commonly found. Associated with marshy areas and margins of water bodies. The larvae develop in aquatic snails.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Sepedon spinipes*			Universal	Associated with marshy areas and margins of water bodies. Larvae develop in aquatic snails.	0	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Tetanocera arrogans*			Universal	Commonly found. Associated with a variety of wet habitats. The larvae prey on snails living at the margins of water bodies.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Tetanocera elata*			Universal	Frequently found. The larvae attack terrestrial slugs in a variety of habitats.	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Tetanocera ferruginea*			Universal	Frequently found. Associated with marshy areas and margins of water bodies. Larvae develop in aquatic snails.	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Sciomyzidae (Snail-killing Flies)	*Trypetoptera punctulata*			Universal	Frequently found in a wide range of habitats. Biology unknown.	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Beris chalybata*			Universal	Commonly found.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Beris vallata*			Universal	Commonly found in a variety of habitats.	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Chloromyia formosa*			Universal	Commonly found. Breeds in rotting vegetation.	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	0	1	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Chorisops nagatomii*			Southern Widespread.	Infequently found in woodland rides and scrub-edge.	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Chorisops tibialis*			Southern Widespread.	Frequently found in woodland rides and scrub-edge.	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	1	1	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Microchrysa flavicornis*			Universal	Commonly found. Breeds in rotting vegetation.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Microchrysa polita*			Universal	Commonly found. Breeds in rotting vegetation.	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Nemotelus notatus*			Universal	Frequently found. A species of coastal wetlands.	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Nemotelus pantherinus*			Southern Widespread	Locally frequently found. Associated with base-rich fens and grazing meadows.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Nemotelus uliginosus*			Universal	Frequently found, locally common, usually a coastal species.	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Odontomyia tigrina*	Nationally Scarce		Southern Restricted	Infrequently found. Associated with areas of wet mud and decaying vegetation at the edges of sedge-beds and ponds, preferring late successional situations.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Oplodontha viridula*			Southern Widespread	Frequently found near well vegetated ponds and ditches.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Oxycera morrisii*	Nationally Scarce		Universal	Infrequently found. The larvae are associated with wet moss in open, calcareous habitats.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Oxycera nigricornis*			Southern Widespread	Frequently found. The larvae are aquatic, living in wet litter or the margins of water bodies	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Oxycera rara*			Southern Widespread	Infrequently found. The larvae are semi-aquatic in wet grassland and at the edges of water bodies.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Oxycera trilineata*			Universal	Frequently found. The larvae are aquatic in a variety of wetland habitats, including brackish ones.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Pachygaster atra*			Southern Widespread.	Frequently found. The larvae develop in rotting vegetation.	0	0	0	1	0	1	1	1	0	0	1	1	0	0	0	1	0	1	1	1
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Pachygaster leachii*			Southern Restricted	Frequently found. The larvae develop in rotting vegetation and wood.	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Stratiomys potamida*	Nationally Scarce		Southern Widespread	Infrequently found. The larvae are associated with the edges of streams and ponds. Appears to have become more frequent in recent years.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Stratiomys singularior*	Nationally Scarce		Southern Widespread	Locally frequently found. Associated with brackish ditches, hence usually coastal.	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Stratiomyidae (Soldierflies)	*Vanoyia tenuicornis*	Nationally Scarce		Southern Restricted	Locally frequent. The larvae breed in the wet mud at the base of vegetation in marshes and wet ffields.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Anasimyia contracta*			Universal	Infrequently found. Associated with reed-mace, Typha sp..	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Baccha elongata*			Universal	Commonly found. A fly of shady places.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chalcosyrphus nemorum*			Universal	Infrequently found, occasionally locally common. The larvae live in sap-runs or under the bark of recently felled trees.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia bergenstammi*			Universal	Commonly found. The larvae mine the roots of plants of the genus Senecio.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia cynocephala*	Nationally Scarce		Southern Widesrpread	Infrequently found. Associated with thistles in alkaline grasslands. Has been reared from Carduus nutans.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia griseiventris*			Southern Restricted.	Infrequently found in a variety of habitats. Recently separated from C. latifrons. Possibly associated with yellow composites.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia grossa*			Southern Widespread	Occasionally found but may be locally frequent. A very early spring species. The larvae feed in the stems of thistles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia illustrata*			Universal	Commonly found in a variety of habitats. The larvae mine the roots of large umbellifers.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia impressa*			Universal	Frequently found. Damp woodlands.	0	1	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia lasiopa*			Universal	Frequently found, usually in woodland glades, but the biology of this species is unknown.	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia latifrons*			Universal	Frequently found. Larvae thought to be associated with yellow composites.	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia pagana*			Universal	Commonly found. The larvae develop in rotting vegetation.	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia proxima*			Universal	Commonly found. The larvae mine roots of Cirsium spp. Unrecorded from Ireland.	0	1	0	0	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia ranunculi*			Unknown	A recent split from Cheilosia albitaris. It is probable that it feeds in the roots of buttercups, as does its sibling species.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia scutellata*			Universal.	Frequently found. Associated with the fruiting bodies of woodland fungi.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia soror*	Nationally Scarce		Southern Restricted	Infrequently found. Strongly associated with chalk and limestone areas. Thought to breed in truffles and possibly other underground fungi.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia variabilis*			Universal	Commonly found. Woodland edges. The larva has been recorded as feeding in the stems and roots of figwort.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia velutina*	Nationally Scarce.		Southern Widespread	Infrequently found. A species of grasslands. Little is known about its larval biology.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Cheilosia vernalis*			Universal	Commonly found. The larvae mine the roots of a number of perennial plants.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysogaster solstitialis*			Universal.	Commonly found. On the margins of wet woodlands and hedgerows. The larvae live in organically rich wet mud.	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysotoxum bicinctum*			Universal	Frequently found. Dry grasslands and heaths, often near scrub. Probably feeds on aphids on roots. There may also be an association with ants.	0	1	0	1	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	1
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysotoxum cautum*			Southern Restricted	Frequently found. Grasslands at the margins of woodland or scrub. Probably feeds on aphids on roots. There may also be an association with ants.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysotoxum elegans*	RDB 3		Southern Restricted	Infrequently found. Local. The larvae are associated with ants.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysotoxum festivum*			Southern Widespread	Infrequently found. Grasslands at the margins of woodland or scrub, particularly in southern England.	0	1	1	1	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Chrysotoxum verralli*			Southern Widespread	Infrequently found. Grasslands, largely south-eastern England. Probably feeds on aphids on roots. There may also be an association with ants.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Dasysyrphus albostriatus*			Universal	Commonly found. Woodland edges.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Dasysyrphus tricinctus*	Nationally Scarce		Universal	Commonly found. Thought to be associated with woodland edges. However, the second brood seems very strongly asociated with heathland habitat	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Epistrophe eligans*			Southern Widespread	Commonly found. The larvae prey on aphids on trees.	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Epistrophe nitidicollis*			Southern Widespread	Infrequently found, although difficult to distinguish in the field. Associated with the margins of broadleaf woodland and hedgerows. Larvae feed on tree and shrub aphids.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Episyrphus balteatus*			Universal	Very commonly found everywhere. A migratory species.	0	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalinus aeneus*			Universal	Abundance: Commonly found very close to shore-line. Breeds in rotting vegetable matter, particularly seaweed.	0	1	1	1	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalinus sepulchralis*			Universal	Commonly found. Organically rich pools, especially on coastal grazing marshes. The larvae are semi-aquatic, occurring in rotting vegetation and in water enriched with animal dung.	0	1	1	1	0	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis arbustorum*			Universal	Very commonly found. The larvae live in organically rich wet mud.	0	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis horticola*			Universal	Commonly found. Local towards the north of the U.K.. The larvae live in organically rich wet mud.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis interruptus*			Universal	Commonly found. Local towards the north of the U.K.. The larvae live in organically rich wet mud.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis intricarius*			Universal	Commonly found. Often in woodland clearings.	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis pertinax*			Universal	Very commonly found. The larvae live in organically rich wet mud.	0	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eristalis tenax*			Universal	Very commonly found. The larvae live in organically rich wet mud.	0	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	0	0	1	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eupeodes corollae*			Universal	Very commonly found everywhere. The larvae feed on aphids. A migratory species.	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eupeodes latilunulatus*	Nationally Scarce.		Universal	Infrequently found. The larvae feed on aphids.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Eupeodes luniger*			Universal	Commonly found. The larvae prey on aphids on conifers.	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Ferdinandea cuprea*			Universal	Infrequently found. The larvae live on sap runs on deciduous trees.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Ferdinandea ruficornis*	Nationally Scarce		Southern Widespread	Rarely found. Possibly associated with Cossus moth workings in old trees.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Helophilus hybridus*			Universal	Locally frequently found. Associated with decaying vegetation at the margins of ponds.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Helophilus pendulus*			Universal	Very commonly found. The larvae live in organically rich wet mud.	0	1	0	1	0	1	1	1	0	1	0	0	1	1	0	0	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Helophilus trivittatus*			Universal	Infrequently found. Most often associated with grazing marshes and coastal meadows. Increased in distribution and found over many more habitat types recently.	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Heringia brevidens*	Nationally Scarce		Southern Widespread	Rarely found. A possible association with Populus.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Heringia heringi*			Southern Widespread	Infrequently found. Local, associated with woodland margins.	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Heringia verrucula*	Nationally Scarce		Universal	Rarely found. An early flying species associated with mixed woodland.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Lejops vittatus*	RDB 2		Southern Restricted	Rarely found. Associated with coastal grazing marsh. The larvae develop in mud and detritus around Scirpus maritimus.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Melangyna labiatarum*			Universal	Abundance: Frequently found. Commoner in the south of England, often in woodland.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Melangyna umbellatarum*			Universal	Infrequently found. Associated with woodland. The larvae prey on aphids, particularly those found on umbelifers.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Melanostoma mellinum*			Universal	Very commonly found. A grassland species.	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Melanostoma scalare*			Universal	Very commonly found. A grassland species.	0	0	1	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Melligramma trianguliferum*	Nationally Scarce		Universal	Infrequently found. The larvae prey on aphids on trees.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Merodon equestris*			Universal	Commonly found. The larvae mine bulbs.	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Myathropa florea*			Universal	Commonly found. The larvae live in wet, decaying leaves.	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	1	1
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Neoascia geniculata*	Nationally Scarce		Universal	Infrequently found. Associated with vegetation standing in open water. Possibly associated with Glyceria grass.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Neoascia interrupta*	Nationally Scarce		Southern Widespread	Infrequently found. Larvae are possibly associated with Typha debris.	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Neoascia meticulosa*			Universal	Locally frequently found. A species of lush marshes. The larvae feed in rotting vegetation.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Neoascia podagrica*			Universal	Commonly found. Associated with lush herbage. The larvae feed in rotting vegetation.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Neoascia tenur*			Universal	Commonly found in marshes and fens. The larvae feed in rotting vegetation.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Orthonevra brevicornis*	Nationally Scarce		Universal	Locally frequent. Associated with base-rich seepages.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Orthonevra geniculata*	Nationally Scarce		Universal	Infrequently found. Associated with seepages in a variety of habitats.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Paragus haemorrhous*			Universal	Commonly found. Associated with patches of bare ground in short grassland.	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	1	1	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Parhelophilus consimilis*	RDB 2.		Universal	Rarely found. Associated with decaying plant material, especially Typha, in bogs and fens.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Parhelophilus frutetorum*			Southern Widespread	Locally commonly found. Associated with Typha and tall vegetation at the edges of open water.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Parhelophilus versicolor*			Universal	Locally commonly found. Associated with Typha at the edges of open water.	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Pipiza bimaculata*			Universal	Frequently found. A difficult species to separate from common relative P. noctiluca. Associated with woodland edges.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Pipiza noctiluca*			Universal	Frequently found. The larvae feed on aphids on trees, the adults are associated with woodland edges.	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Pipizella maculipennis*	RDB 3		Southern Widespread	Rarely found. A species of dry grassland and woodland. The larvae feed on aphids on roots.	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Pipizella viduata*			Universal	Commonly found. A species of dry grassland. The larvae feed on aphids on umbellifer roots.	0	1	1	1	0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Pipizella virens*	Nationally Scarce b		Southern Widespread	Infrequently found. Possible association with aphids on roots of umbellifers.	0	1	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus albimanus*			Universal	Commonly found. The larvae are predatory.	0	0	0	1	0	1	1	1	0	1	0	0	0	1	1	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus amplus*			Northern Restricted	A Recently described species	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus angustatus*			Universal	Commonly found. The larvae are predatory.	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus aurolateralis*			Southern Widespread	Rarely found. The larvae are predatory. Recognised as a separate species in 2002.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus clypeatus s.s.*			Universal	Commonly found. The larvae are predatory.	0	1	0	1	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus fulviventris*			Universal	Locally commonly found. Associated with lush marshy places.	0	0	1	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus granditarsus*			Universal	Commonly found amongst lush vegetation. The larvae are predatory.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus peltatus*			Universal	Commonly found. The larvae prey on aphids on herbs and grasses.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus peltatus s.s.*			Universal	Commonly found. The larvae prey on aphids on herbs and grasses.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus rosarum*			Universal.	Locally commonly found. Associated with lush marshy places. The larvae are predatory.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Platycheirus scutatus s.s.*					0	0	0	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Riponnensia splendens*			Southern Widespread	Frequently found in lush marshes and fens, especially in the south.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Scaeva pyrastri*			Universal	Commonly found. A migratory species. The larvae feed on aphids within grassland.	0	0	0	1	0	0	1	1	0	0	0	0	1	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Scaeva selenitica*			Universal	Infrequently found. The larvae feed on aphids on pine.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Sphaerophoria rueppellii*			Universal	Locally commonly found in the south-east. Uncommonly found elsewhere. Usually In dry grassland, although it has been also found along the edges of saltmarsh.	0	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Sphaerophoria scripta*			Universal	Very commonly found in the southern half of the British Isles. A grassland species, the larvae feed on aphids and Homoptera living in the ground layer.	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Sphaerophoria taeniata*			Universal	Frequently found. Associated with wet meadows.	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Syritta pipiens*			Universal	Very commonly found in most places throughout Britain. The larvae live in decaying vegetation.	0	1	0	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Syrphus ribesii*			Universal	Very commonly found. A migratory species. The larvae feed on aphids.	0	1	0	1	1	1	1	1	0	1	1	1	0	0	0	1	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Syrphus torvus*			Universal	Commonly found. Woodland edges. The larvae feed on aphids.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Syrphus vitripennis s.l.*			Universal	Commonly found. Woodland edges. The larvae feed on aphids. Two species present under this name.	0	0	0	1	1	0	1	1	0	1	1	1	0	1	0	0	1	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Tropidia scita*			Universal	Locally common. A species of lush fen and marsh.	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Volucella bombylans*			Universal	Commonly found. The larvae live in bumble bee nests.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Volucella inanis*	Nationally Scarce		Southern Restricted	Infrequently found. The larvae live as ectoparasites of the grubs of social wasps. Becoming more frequently recorded in the past ten years.	0	0	0	1	0	0	1	1	0	1	0	1	0	0	1	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Volucella pellucens*			Universal	Commonly found. Woodland edges and scrub. The larvae live in social wasp nests.	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Volucella zonaria*	Nationally Scarce		Southern Restricted	Frequently found, but very localised to warm areas. The larvae live in the nests of social wasps.	0	0	0	0	0	1	1	0	0	1	1	1	0	1	1	0	0	0	1	0

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160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Xanthogramma citrofasciatum*			Southern Widespread	Locally frequently found. Associated with ants in dry grasslands. They feed on the aphids tended by Lasius ants.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Xanthogramma pedissequum*			Southern Widespread	Frequently found on dry grasslands. There is an association with Lasius ant nests.	0	0	0	1	0	0	1	1	0	1	1	1	1	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Xylota segnis*			Universal	Commonly found. Woodlands and hedgerows. A dead-wood breeding species which will even use sawdust!	0	1	0	1	1	1	1	0	0	0	0	1	0	1	0	1	0	0	1	0
160 DIPTERA (Flies)	Syrphidae (Hoverflies)	*Xylota sylvarum*			Universal	Commonly found. Woodlands and hedgerows. A dead-wood breeding species which will even use sawdust!	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Chrysops caecutiens*			Universal	Commonly found. Associated with wet woodlands. Commoner in England and Wales than C. relictus.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Chrysops relictus*			Universal	Frequently found. Associated with wet woodlands. Commoner in Scotland than C. caecutiens.	0	1	1	1	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Hybomitra bimaculata*			Southern Widespread	Frequently found. Especially associated with wet heathy woodlands.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Hybomitra ciureai*	RDB 3		Southern Restricted	Rarely found. Associated with freshwater grazing-level ditches The larvae are aquatic predators.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Tabanus autumnalis*			Southern Restricted	Frequent in southern and midland England. The larvae live in wet mud.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Tabanus bromius*			Southern Restricted	Infrequently found. Woodland and damp meadows.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Tabanidae (Horseflies)	*Tabanus cordiger*	Nationally Scarce		Universal	Rarely found. Associated with old broadleaf wooldands. Known to breed in running water, especially gravelly or stony streams, including chalk rubble at Lutcome Stream, Ashford Hangers.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Aplomya confinis*			Southern Restricted	Locally frequently found. Parasitises the larvae of lycaenid butterflies.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Athrycia trepida*			Universal	Commonly found. A parasite of noctuid moths.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Cistogaster globosa*	RDB 1		Southern Restricted	Locally frequent, becoming more so. Dry grassland with bare ground. Parasitic on Bishops Mitre Bug.	0	1	0	1	0	1	1	0	0	0	0	0	1	1	1	0	0	1	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Cylindromyia interrupta*			Southern Restricted	Locally frequently found, in woodland, host unknown	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Dufouria chalybeata*			Southern Widespread	Frequently found. It is a parasite of various species of tortoise beetle. Recorded from England and Wales.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Eriothrix rufomaculata*			Universal	Commonly found. In grassland habitats	0	0	1	1	0	1	1	1	0	1	0	1	1	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Ernestia rudis*			Universal	Commonly found. A parasitoid of the larvae of noctuid moths	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Eurithia anthophila*			Universal	Commonly found. It is a parasite of various lepidopterous larvae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Gonia picea*			Southern Widespread	Infrequently Found.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Tachinidae	*Gonia picea*			Widespread	data not avaialble																				
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Gymnocheta viridis*			Universal	Commonly found. It is a parasite of noctuid (Lepidoptera) larvae boring grasses and sedges.	0	1	0	1	1	0	0	0	0	0	0	1	0	1	1	1	0	0	1	0

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Gymnosoma nitens*	RDB 1		Southern Restricted	Infrequently found, and very local. In common with many other tachind flies associated with Hemiptera this species has become more widespread in the recent past. It is now a frequent component of the fauna of Thames corridor gravel terrace sites. Parasitises Sciocoris curtisans and possibly other shield-bugs.	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	1	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Gymnosoma rotundatum*	RDB 3		Southern Restricted	Locally frequently found. On flowers in grassland and woodland. Increased in abundance and range greatly in past 10 years. Parasitises sheild-bugs.	0	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	0	1	0	1
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Leiophora innoxia*			Southern Restricted	Commonly found. A parasitoid of adult beetles	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Lydella stabulans*			Universal	Frequently found, but local. It parasitises the larvae of stem-boring moths, usually those occurring in wetland areas.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Lydina aenea*			Universal	Frequently found. A parasite of lepidoptera larvae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Macquartia dispar*			Southern Widespread	Frequently found. A parasitoid of the larvae of larger Chrysomelidae (Coleoptera) but the exact species is unknown.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0

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160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Phasia pusilla*			Universal	Locally frequently found. It is a parasitoid of various species of bug, in Britain several species of lygaeid have been recorded, grassland and scrub.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Phryxe vulgaris*			Universal	Commonly found. It parasitises a large range of Lepidoptera larvae, usually those on herbs.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Ramonda spathulata*			Universal	Commonly found. It is a parasitoid of Lepidoptera, especially grassland Noctuidae.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Tachina fera*			Universal	Commonly found. It is a parasitoid of noctuid (Lepidoptera) larvae.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Thelaira solivaga*			Southern Restricted	Frequently found. Larvae parasitic on Lepidoptera Arctidae, including Arctia villica the Cream-spot Tiger Moth.	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
160 DIPTERA (Flies)	Tachinidae (Parasite Flies)	*Trixa conspersa*			Universal	Commonly found. Probably a parasitoid of ground-dwelling Lepidoptera larvae.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Acanthiophilus helianthi*	Nationally Scarce b		Southern Restricted	The larvae develop in the capitula of common knapweed. Considered rare, but there are a number of recent records from southern England.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Acidia cognata*			Universal	Commonly found. The larvae mine the leaves of Colt's-foot	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Anomoia purmunda*			Southern Widespread	Commonly found. The larvae feed in the fruits of Rosaceous trees and shrubs	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0

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160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Campiglossa malaris*	RDB K		Southern Restricted	Frequently found. First found in the British Isles in the 1970's at Sugar Loaf Hill near Folkstone, East Kent. It has spread considerably in southern England since. It is stated by White (1988) to be restricted to sites bordering the English Channel in France and the Netherlands abroad but is now known from the Netherlands, Belgium and Switzerland. The host plant has not been positively confirmed but is thought to be Hoary Ragwort Senecio erucifolius.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Campiglossa misella*			Southern Restricted	Locally frequently found. Larvae attack the flower spike of Artemisia vulgaris, inducing a stem gall in the first generation and developing in the capitula in the second generation.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Campiglossa plantaginis*			Southern Widespread	Found locally in southern Britain. Mainly found in coastal districts, especially saltmarshes. Associated with Artemisia maritimia and A. vulgaris. Larvae attack the capitula of the host plants. Has als obeen found in the Brecks, where it was associated with Ragwort.	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Chaetorellia jaceae*			Southern Restricted	Frequently found. The larvae develop in the seed heads of Asteraceae	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Chaetostomella cylindrica*			Universal	Commonly found, on Hardheads Centaurea nigra	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Euleia heraclei*			Universal	Commonly found. The Celery Fly. The larvae mines the stems of Apiaceae.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Merzomyia westermanni*	Nationally scarce		Southern Restricted	Frequently found. Local in south-east England but perhaps more frequent than originally thought. The larvae develop in the flower-heads of ragwort Senecio species.	0	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Myopites inulaedyssentericae*	RDB 3		Southern Restricted	Commonly found. A highly localised but probably under recorded species that is confined to a few counties in the south of England. However, it has recently become more common, at least in south-east England. The larvae develop in the flower heads of Common Fleabane Pulicaria dysenterica.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Orellia falcata*	Nationally Scarce		Southern Restricted	Infrequently found. The larvae develop in the roots of Goat's Beard, Tragopogon pratensis.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Sphenella marginata*			Universal	Commonly found. On Ragwort Senecio jacobaea	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis bardanae*			Universal	Commonly found. The larva attacks the capitulum of burdock.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis cometa*			Southern Restricted	Frequently found on Creeping Thistles Cirsium vulgare	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis divisa*			Southern Restricted	Commonly found. Recent arrival from southern Europe. Associated with Picris echioides.	0	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	0	1	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis formosa*			Southern Restricted	Commonly found. On Sonchus species	0	1	1	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis hyoscyami*			Southern Restricted	Larvae feed in the developing seed head of Carduus thistles.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis matricariae*			Southern Restricted	Infrequently found. The larva feeds in the capitula of Crepis spp., It is a recent addition to the British list, first found in 2000 at several sites in East Kent.	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis neesii*			Universal	Commonly found on Ox-eye Daisy Leucanthemum vulgare	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Tephritis vespertina*			Universal	Commonly found. On Hypochoeris radicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Terellia ruficauda*			Southern Widespread	Commonly found. On thistles	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Terellia tussilaginis*			Southern Widespread	Commonly found. The larvae develop in the seed heads of Burdocks	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Urophora cardui*			Southern Restricted	Commonly found, on Creeping Thistles Cirsium vulgare	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Urophora jaceana*			Universal	Commonly found, on Hardheads Centaurea nigra	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Urophora quadrifasciata*			Southern Restricted	Commonly found on Hardheads Centaurea nigra	0	1	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Urophora stylata*			Southern Widespread	Commonly found. Galls flower and seed-heads of thistles.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tephritidae (Picture-wing Flies)	*Xyphosia miliaria*			Universal	Commonly found on thistles	0	1	0	0	0	0	0	1	1	1	0	0	1	0	1	0	0	0	1	0
160 DIPTERA (Flies)	Therevidae (Stiletto Flies)	*Thereva fulva*	RDB 3		Southern Restricted	Infrequently found. Associated with light sandy areas, especially dunes.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Therevidae (Stiletto Flies)	*Thereva nobilitata*			Universal	Commonly found. The commonest Therevid fly, often associated with dry grasslands. The larva lives in loose soil.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0

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160 DIPTERA (Flies)	Therevidae (Stiletto Flies)	*Thereva plebeja*	Nationally Scarce		Southern Restricted	Infrequently found. A species of dry meadows, becoming less common than formerly.	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Nephrotoma appendiculata*			Universal	Commonly found. A species of dry grassland.	0	0	1	1	1	0	1	0	0	0	0	1	0	1	0	1	1	1	1	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Nephrotoma flavescens*			Universal	Commonly found. A species of dry grasslands.	0	1	0	1	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Nephrotoma flavipalpis*			Universal	Frequently found. A species of hedgerows in well-drained situations.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Nigrotipula nigra*			Southern Widespread	Infrequently found. Associated with damp peat in fens.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula fascipennis*			Universal	Commonly found. A hedgerow species.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula lunata*			Universal	Commonly found. Associated with lush woodland.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula oleracea*			Universal	Commonly found. Associated with pastures on wet soils.	0	1	1	1	1	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula paludosa*			Universal	Very commonly found. A pasture pest species.	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula pierrei*			Universal	Frequently found. The larvae are associated with the open margins of coastal ditches and pools and eutrophic lakes. Some emergent vegetation needs to be present.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0
160 DIPTERA (Flies)	Tipulidae (Craneflies)	*Tipula vernalis*			Universal	Commonly found. A species of herb-rich grasslands in open situations.	0	0	1	0	0	1	1	0	0	1	0	1	0	1	1	1	0	1	1	0
160 DIPTERA (Flies)	Ulidiidae	*Ceroxys urticae*			Universal	Locally commonly found. In wetland habitats.	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0

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160 DIPTERA (Flies)	Ulidiidae	*Dorycera graminum*	RDB 3. A UK BAP species	S41	Southern Restricted	Frequently found. Associated with taller grasslands, often dry ones. However, the larval food plant is unknown; it may be the roots or inflorescences of grasses.	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	1	0
160 DIPTERA (Flies)	Ulidiidae	*Herina longistylata*	Nationally Scarce		Southern Widespread	Larvae probably feed in vegetation litter.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Ulidiidae	*Melieria omissa*			Southern Widespread	Frequently found, but local. In marshy places and pond margins, larvae in decaying vegetation	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Ulidiidae	*Melieria picta*	Nationally scarce		Southern Restricted	Infrequently found. Very local, coastal, especially Thames Estuary.	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0
160 DIPTERA (Flies)	Xylomyidae	*Solva marginata*	Nationally Scarce.		Southern Restricted	Infrequently found. I find this species from malaise traps set in damp woodland in Sussex and Hampshire.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Argidae	*Arge cyanocrocea*			Southern Widespread	The Rose Sawfly. The larvae fed on the leaves of Rosacae, especially brambles.	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Argidae	*Arge ochropus*			Southern Restricted	Frequently found. The larvae feed on rose leaves.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
170 HYMENOPTERA SYMPHYTA (Sawflies)	Argidae	*Arge pagana*			Southern Widespread	Frequently found. The larvae feed on rose.	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Cephidae	*Calameuta filiformis*			Southern Widespread	Commonly found. Larvae mine smaller stems of reed and grasess.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Cephidae	*Calameuta pallipes*			Southern Widespread	Commonly found. The larva is unrecorded but is likely to mine grasses.	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Cephidae	*Cephus pygmeus*			Southern Widespread	Very commonly found. Larvae in the stems of grasses, including crops. A pest species.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Cephidae	*Cephus spinipes*			Southern Restricted	Commonly found. The larvae bore into the stems of grasses such as timothy.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0

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170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Aglaostigma fulvipes*			Universal	Commonly found. Larvae on Bedstraws	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Allantus cinctus*			Universal	Commonly found. Feeds on rose and strawberry leaves	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Athalia cordata*			Universal	Commonly found. The larvae feed on the leaves of various plants including bugle and plantain.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Athalia rosae*			Southern Widespread	Very commonly found. The larva feeds on various species of crucifer, and was formerly a pest of turnips.	0	1	1	0	0	1	1	0	0	1	0	1	0	0	1	0	0	1	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Caliroa cerasi*			Southern Widespread	Commonly found. larvae feed on developing fruits of Rosacae	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Caliroa cinxia*	pRDB3		Southern Restricted	Infrequently found. Larvae feed on Oak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Dolerus germanicus*			Universal	Commonly found. Larvae on Equistetum	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Dolerus picipes*			Universal	Commonly found. The larva feeds on grass.	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Dolerus puncticollis*			Universal	Commonly found. The larvae feed on grass.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Empria tridens*			Universal	Commonly found. The larvae feed on herbaceous plants of the family Rosaceae	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Eriocampa ovata*			Universal	The larvae feed on alder. Common throughout Britain.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Halidamia affinis*			Universal	Commonly found. On goosegrass.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Heterarthrus microcephalus*			Universal	Commonly found. mines the leaves of Salix.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Hoplocampa crataegi*			Southern Restricted	Frequently found. Larvae develop in fruit of Hawthorn.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Hoplocampa pectoralis*			Southern Restricted	Frequently found. Larvae develop in fruit of Hawthorn.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Macrophya alboannulata*			Southern Widespread	Frequently found. Larvae on Elder	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Macrophya annulata*			Universal	Commonly found. The larvae feed on creeping cinquefoil.	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	1	0

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170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Macrophya ribis*			Universal	Locally frequently found. The larvae feed on Elder.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Nematus lucidus*			Southern Restricted	Frequently found. Larvae on Hawthorn and Blackthorn.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Pachyprotasis rapae*			Universal	Commonly found. The larva feeds on a range of plants including betony, golden-rod, figwort and ash.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Pachyprotasis variegata*			Universal	Commonly found. The larvae have been recorded as feeding on potato, but probably have a wider range of foodplants.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Rhogogaster viridis*			Universal	Commonly found. Lush vegetation and scrub. Larvae possibly feed on leaves of woody plants.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Selandria serva*			Universal	Commonly found. The larva feeds on various species of sedge, rush and grass.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Strongylogaster multifasciata*			Universal	Commonly found. The larva feeds on ferns, chiefly bracken.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Tenthredo brevicornis*			Universal	Commonly found. The larva feeds on common bird's-foot trefoil.	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Tenthredo temula*			Southern Widespread	No data	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Tenthredopsis friesei*			Southern Widespread	Commonly found. The larva feeds on grass.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Tenthredopsis litterata*			Universal	Commonly found. The larva feeds on grass, especially cock's-foot.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
170 HYMENOPTERA SYMPHYTA (Sawflies)	Tenthredinidae	*Tenthredopsis nassata*			Universal	Commonly found. The larva feeds on grass, especially cock's-foot. Throughout Britain.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Chalcididae (Parasitic Wasps)	*Brachymeria minuta*			Southern Widespread	Infrequently found. An internal parasite of sarcophagid flies.	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0

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180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Chalcididae (Parasitic Wasps)	*Haltichella rufipes*			Southern Restricted	Very rarely recorded. Biology not known	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Andricus aries*			Southern Restricted	Commonly found. It galls the bud of oak. A recent arrival.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Andricus kollari*			Universal	Commonly found. The female lays an egg in the buds of Oak, which induces the formation of a round marble gall. The second generation of the year galls the roots of Oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Andricus quercuscalicis*			Southern Widespread	Commonly found. The female lays an egg in the female flowering buds of Oak, which induces the formation of a knopper gall at the base of the acorn. The second generation of the year galls the roots of Oak.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Diplolepis nervosa*			Southern Widespread	Commonly found, but local. Makes pea galls on the leaves of rose.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Diplolepis rosae*			Universal	Commonly found. The female lays an egg in the buds of Rose, which induces the formation of a pin-cushion gall.	0	1	0	0	0	0	1	1	0	1	0	0	1	1	0	1	0	0	1	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Neuroterus anthracinus*			Universal	Commonly found. It lives on oak, the sexual generation galling leaves and catkins, the agamic generation galling leaves	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Neuroterus numismalis*			Universal	Commonly found. It lives on oak, both generations making galls on the leaves.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Cynipidae (Gall Wasps)	*Neuroterus quercusbaccarum*			Universal	Commonly found. It causes galls on oak, either on the catkins or on the leaves.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0

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180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Gasteruptiidae (Parasitic Wasps)	*Gasteruption assectator*			Southern Restricted	Frequently found. A clepto-parasite of stem-nesting bees.	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Gasteruptiidae (Parasitic Wasps)	*Gasteruption jaculator*			Southern Restricted	Commonly found. A clepto-parasite of stem-nesting bees.	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Gasteruptiidae (Parasitic Wasps)	*Gasteruption minutum*			Southern Restricted	Infrequently found and very local. A parasite of stem-nesting aculeates	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Ichneumonidae (Ichneumon Wasps)	*Endromopoda arundinator*			Universal	Commonly found. Host unknonwn, but associated with Common Reed.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Ichneumonidae (Ichneumon Wasps)	*Listrodromus nycthemerus*			Southern Widespread	Commonly found. A parasitoid of the Holly Blue butterfly	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Ichneumonidae (Ichneumon Wasps)	*Pimpla rufipes*			Universal	Commonly found. It is a parasitoid of naked or cocooned pupae of Lepidoptera which pupate above ground level.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
180 HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)	Ichneumonidae (Ichneumon Wasps)	*Zaglyptus varipes*			Universal	Commonly found. A parasitoid of Spider egg sacks.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Bees)	*Panurgus calcaratus*			Southern Widespread	Locally frequently found. Oligolectic, associated with yellow flowered Asteraceae (composites). Ground nesting.	0	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena alfkenella*	RDB 3		Southern Restricted	Infrequently found. Strongly associated with calcareous grassland in south-eastern England, also associated with heathland edge in south-western England. Polylectic.	0	1	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena bicolor*			Universal	Very commonly found. Polylectic. Ground nesting.	0	0	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	1	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena chrysosceles*			Southern Widespread.	Commonly found. Especially associated with clay woodlands. Polylectic. Ground nesting.	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena clarkella*			Universal	Commonly found. Early spring woodland species. Oligolectic on Salix spp.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena dorsata*			Southern Widespread	Commonly found. Often the dominant species in southern Britain. Polylectic.	0	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena flavipes*			Southern Restricted.	Commonly found. Forms very large colonies, especially in bare ground. Polylectic. Ground nesting.	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena florea*	RDB 3		Southern Restricted	Frequently found. Oligolectic, utilises White Bryony, Bryonia cretica, as its sole pollen source. Most often associated with sandy soils, nests in hard ground such as on tracks.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena fulva*			Southern Widespread.	Locally commonly found, often in woodlands and gardens. Polylectic.	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena haemorrhoa*			Universal	Commonly found. Females nest singly but males often congregate on blackthorn and hawthorn blossoms. Polylectic. Ground nesting.	0	1	0	0	1	1	1	0	0	1	0	0	0	1	1	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena helvola*			Southern Widespread.	Locally commonly found. Often in woodland clearings. Polylectic.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena humilis*	Nationally Scarce b		Southern Widespread.	Infrequently found, rarely common where it does occurr. Oligolectic on Asteraceaee, with a stong association with yellow flowers.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena labialis*			Southern Widespread	Local species of old meadowlands. Oligolectic on the flowers of Fabacaea.	0	1	1	1	1	0	1	1	0	1	1	0	1	0	1	1	0	0	1	1

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena labiata*	Nationally Scarce a		Southern Restricted	Locally frequent. Old meadowland and heathy grassland species. Polylectic, although it is often found associated with the flowers of Germander Speedwell, Veronica chamaedrys.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena minutula*			Universal	Commonly found. Polylectic. Ground nesting.	0	0	0	1	0	0	1	0	0	1	0	1	0	1	1	0	1	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena minutuloides*	Nationally Scarce a		Southern Restricted	Infrequently found. Strongly associated with sandy and calcareous grasslands. Polylectic.	0	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena nigroaenea*			Universal.	Commonly found. Polylectic. Ground nesting.	0	1	0	1	0	0	1	0	0	1	0	1	0	0	1	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena nigrospina*	RDB 2		Southern Widespread	Very difficult to distinguish from A. pilipes, but has a different phenology.	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena nitida*			Southern Widespread	Commonly found. A species of meadows. Polylectic. Ground nesting.	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena niveata*	RDB 2		Southern Restricted	Rarely found. Oligolectic on Brassicaceae. Ground nesting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena pilipes s.l.*			Southern Widespread	Two species are confused under this name, A. pilipes s.s. and A. nigrospina.	0	0	1	1	0	0	1	0	0	1	0	1	1	1	1	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena pilipes s.s*	Nationally Scarce b		Southern Restricted.	A recent split, this is the commoner of two species formerly known as Andrena pilipes.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena praecox*			Southern Widespread	Locally frequently found. Oligolectic on blossom of sallows.	0	1	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena scotica*			Universal	Commonly found. Several females may share a common burrow entrance. Polylectic.	0	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	0	0	1	0

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Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena semilaevis*			Universal	Commonly found. Polylectic, although with an apparent preference for Apiaceae.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena subopaca*			Universal.	Commonly found, especially in clay woodlands. Polylectic. Ground nesting.	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena synadelpha*			Southern Restricted	Infrequently found. Associated with open woodlands and woodland edges. Local. Polylectic.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena thoracica*			Southern Restricted.	Locally common. A species of Heathland and coasts. Polylectic. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena tibialis*	Nationally Scarce a		Southern Widespread	Locally common. A large mid-spring species which seems most frequently found in sandy locations. Polylectic. Ground nesting	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena trimmerana*	Nationally Scarce b		Southern Restricted	Infrequently found. Often a species of the coastal areas of the southern counties of England. Polylectic. Ground nesting.	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena varians*	Nationally Scarce b		Southern Widespread.	Rarely found, a greatly declined species which is often associated with the flowers of rosaceous shrubs such as blackthorn and hawthorn. Polylectic. Ground nesting	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Andrenidae (Mining Bees)	*Andrena wilkella*			Universal	Frequently found in unimproved meadows. Oligolectic on Fabaceae. Ground nesting.	0	1	1	0	0	1	1	1	0	1	0	1	0	1	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Anthophora bimaculata*			Southern Restricted.	Locally commonly found in heathy localities. Nests in the ground. Polylectic.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Anthophora furcata*			Southern Widespread	Infrequently found. Oligolectic on Lamiacaea. Nests in dead wood.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Anthophora plumipes*			Southern Widespread	Commonly found. Nests in the ground or cliffs and walls.	0	0	1	1	0	1	1	0	0	1	0	1	0	1	1	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Anthophora quadrimaculata*	Nationally Scarce b		Southern Widespread	Infrequently found. Polylectic, but often associated with labiates. Nests in the ground.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Apis mellifera*			Universal	Abundant almost everywhere. A domesticated insect.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus hortorum*			Universal	Very commonly found. Polylectic. Nests underground in cavities.	0	1	1	0	0	1	1	1	0	0	0	1	1	1	1	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus humilis*	a UK-BAP species	S41	Southern Widespread	BAP species. Frequently found. A declining species, more frequent in coastal localities of the south-west. Associated with taller grasslands, but with plenty of perennial flowers present. Surface nesting.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus hypnorum*			Southern Widespread	Commonly found. Recent colonist, first recorded in 2001 near Southampton, Now spreading rapidly. Strongly associated with gardens and woodland. Often nests in aerial cavities, including bird boxes. Polylectic.	0	0	0	1	0	1	0	0	0	1	1	0	1	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus lapidarius*			Universal	Very commonly found. Nests underground in cavities. Polylectic.	0	1	1	0	0	0	1	0	0	1	0	1	0	0	1	1	0	1	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus pascuorum*			Universal	Very commonly found. Polylectic. Nests in surface litter.	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus pratorum*			Universal	Very commonly found. Polylectic. Nests underground as well as in aerial cavities, including bird boxes.	0	1	1	1	1	0	1	0	0	1	0	0	0	1	1	0	0	1	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus rupestris*	Nationally Scarce b		Southern Widespread	Frequently found. A great increase in both range and frequency during the 1990s. Breeds in nests of B. lapidarius.	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus terrestris*			Universal	Very commonly found. Polylectic. Nests underground in cavities.	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	0	1	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Bombus vestalis*			Southern Widespread	Commonly found. Breeds in nests of B. terrestris.	0	1	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Ceratina cyanea*	RDB 3.		Southern Restricted	Locally frequently found. This small blue bee is our only Carpenter Bee, so called because of their habit of drilling burrows in wood in which to make their nests. They do this with their strong mandibles. Ceratina drills out the soft pith of dead ramble stems, both for nests which are provisioned during May and June, and for overwintering by the adults which emerge from these summer nests. Overwintering is communal, unmated males and females pack into drilled stems, following in the one which made the burrow. I have found up to ten adults in one stem.	0	1	1	1	0	1	1	0	0	0	1	1	0	1	1	1	0	0	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Epeolus variegatus*			Universal.	Commonly found in sandy localities. A cleptoparasite of Colletes similis and C. daviesanus.	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Melecta albifrons*			Southern Widespread	Infrequently found. A cleptoparasite of Anthophora plumipes.	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada fabriciana*			Universal.	Commonly found. Parasitises several Andrena species. Ground nesting.	0	1	1	1	0	1	1	0	0	1	0	0	0	1	1	0	0	0	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada flava*			Southern Widespread	Commonly found. Parasitises several Andrena species. Ground nesting.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada flavoguttata*			Universal	Commonly found. Parasitises several Andrena species. Ground nesting.	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada flavopicta*	Nationally Scarce b		Southern Widespread	Infrequently found. A cleptoparasite of Mellitta bees.	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada fucata*	Nationally Scarce a		Southern Restricted.	Frequently found. Becoming much more widespread recently. The host of this species, Andrena flavipes, has always been more widespread than the Nomada.	0	1	1	0	0	0	1	0	0	1	0	1	0	0	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada fulvicornis*	RDB 3		Southern Restricted	Infrequently found. Predominantly a heathland bee, as are its host species, Andrena bimaculata and A. tibialis.	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada goodeniana*			Universal	Commonly found. Parasitises several Andrena species. Ground nesting.	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada hirtipes*	RDB 3		Southern Restricted	Rarely found. A Cleptoparasite of the rare mining bee Andrena bucephala.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada marshamella*			Universal.	Commonly found. Parasitises several Andrena species.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada ruficornis*			Universal.	Frequently found. Cleptoparasite of Andrena haemorrhoa.	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Apidae (Bees)	*Nomada striata*			Universal.	Infrequently found. A cleptoparasite of Andrena wilkella.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Bethylidae (Solitary Wasps)	*Bethylus fuscicornis*			Universal	Frequently found.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis angustula*			Southern Widespread	Commonly found. Parasitises Eumenidae. Ancistrocerus trifasciatus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis ignita s.s.*			Universal	Frequently found, but identification to species is very difficult. Cleptoparasite of Eumenid wasps	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis impressa*			Universal.	Commonly found. Associated with eumenid wasps of the genus Ancistrocerus.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis mediata*			Southern Restricted.	Infrequently found. Probably associated with eumenid wasps, including Ancistrocerus.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis rutiliventris*			Universal	Widespread, common in some coastal localities. associated with Eumenid wasps, including Ancistrocerus.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Chrysis viridula*			Southern Widespread.	Locally common. Parasitises the Eumenid wasps of the Genus Odynerus.	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Cleptes semiauratus*	Nationally Scarce b		Southern Widespread	Parasitic upon Gooseberry sawfly, Nematus ribesii, among others. The female oviposits on the pupa of the sawfly after biting through the cocoon. A much rarer species than it used to be.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Hedychridium ardens*			Universal.	Locally commonly found. Sandy places, a cleptoparasite of Tachysphex pompiliformis and probably other ground-nesting sphecids.	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Hedychridium roseum*			Southern Restricted	Frequently found. A cleptoparasite of the sphecid wasps Astata boops, Tachysphex pompiliformis and Gorytes tumidus.	0	0	0	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Hedychrum niemelai s.s.*			Southern Restricted	Frequently found, but local. Sandy places. A cleptoparasite of Cerceris spp. of the C quinquefasciata group. I have found the species associated with wind-blown sand deposits on Cornish sea cliffs. A species which is increasing its range at the moment.	0	1	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Hedychrum nobile*			Southern Restricted	Frequently found, but local. Sandy places. A cleptoparasite of Cerceris arenaria and recently recognised as separate from Hedychrum niemelai. A species which is increasing its range at the moment.	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Omalus aeneus*			Southern Restricted.	Infrequently found. Parasitises Pemphredonine wasps which nest in old beetle burrows.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Pseudomalus auratus*			Southern Widespread	Frequently found, particularly from reared nests. Parasitises stem nesting aculeates.	0	1	0	1	0	0	0	1	0	1	0	1	1	1	0	1	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Pseudomalus violaceus*	Nationally Scarce b		Southern Widespread	Infrequently found. Parasitises dead-wood nesting solitary wasps, including Pemphredon lugubris.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Pseudospinolia neglecta*			Southern Widespread	Locally frequent. Parasitises the Eumenid wasp Odynerus spinipes and probably O. melanocephala.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Chrysididae (Cuckoo Wasps)	*Trichrysis cyanea*			Universal.	Commonly seen on dead wood and bare banks in the sun. A cleptoparasite of several species of small wasps.	0	0	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	1	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes daviesanus*			Universal.	Locally common, sometimes in extensive colonies on sandstone cliffs. Oligolectic on Asteracea.	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes fodiens*			Universal.	Locally common. Heaths and coastal dunes. Oligolectic, associated with the flowers of Asteracea (Composites). Ground nesting.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes halophilus*	Nationally Scarce. A UK BAP species	S41	Southern Restricted.	A UK BAP species. Locally frequently found. The female gathers pollen from the flowers of Sea Aster, Aster tripolium. Nests are made in dry clay banks and sandy areas.	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes hederae*	pRDB 3		Southern Restricted	Very commonly found visiting Ivy. Only recognised on the mainland of the UK in 2000. Known on the Channel Islands for much longer. Conservation status no longer justified.	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes marginatus*	Nationally Scarce a		Southern Widespread	Locally common in coastal dunes in southern Britain, with a population in the East Anglian Brecks. Often forages at Bramble. Polylectic although Westrich lists it as oligiolectic on Fabaceae. Ground nesting.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Colletes similis*			Southern Widespread.	Usually infrequently found, although the commonest Colletes on the coasts of Devon and Cornwall. Ground nesting. Oligolectic on Asteraceae.	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus brevicornis*			Southern Widespread	Commonly found. Polylectic. Dead-stem nesting.	0	1	0	0	0	1	1	0	0	1	0	1	1	0	1	0	0	1	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus communis*			Southern Widespread	Commonly found. Polylectic. Cavity nesting.	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus confusus*			Universal	Commonly found. Polylectic. Cavity nesting	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus cornutus*	Nationally Scarce a		Southern Restricted	Frequently found. A species of open woodland edge habitat. Polylectic, but often associated with umbellifers. Become much commoner during the past ten years. Nests in hollow stems.	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0	0	1	0	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus dilatatus*			Southern Restricted.	Locally frequently found. Nests in dead Bramble stems. Polylectic. Previously known as Hylaeus annularis	0	1	0	1	0	1	1	0	0	1	0	1	1	1	1	1	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus hyalinatus*			Southern Widespread	Commonly found, especially in coastal situations.	0	1	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus pectoralis*			Southern Restricted.	Infrequently found. A species of dry reedbeds and associated grassland. Utilises the old gall-chambers of the fly Lipara lucens on Common Reed, Phragmites australis, as a nesting site. Polylectic.	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus pictipes*	Nationally scarce a		Southern Restricted	Very local, rarely frequently found. It nests in old beetle burrows in dead wood.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Colletidae (Bees)	*Hylaeus signatus*	Nationally Scarce b		Southern Widespread	Locally frequently found. Oligolectic on Reseda. Local cyclical disturbance is essential to provide habitat for the Reseda. Stem and ground-nesting.	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Astata boops*			Southern Restricted.	Frequently found, but local. Nests in bare, often sandy, places. Preys on shieldbug nymphs. Ground nesting.	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Cerceris quinquefasciata*	RDB 3 a UK-BAP species	S41	Southern Restricted	Infrequently found and local. This species hunts several common species of weevils and is associated with sandy grasslands. A species which is increasing its range at the moment.	0	0	0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Cerceris rybyensis*			Southern Restricted.	Locally commonly found. Heathland and downland. Preys on various solitary bees. Ground nesting.	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	1	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus annulipes*			Universal.	Locally commonly found. Preys on Homopteran bugs. Nests in dead wood.	0	0	0	1	0	1	1	1	0	1	0	1	0	1	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus capitosus*			Universal.	Very rarely found. Nests in dead wood. Hunts small flies.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus cetratus*			Southern Widespread	Frequently found. Woodland edges and rides. It nests in dead wood and preys on small flies.	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus congener*			Southern Restricted	Infrequently found and local. A recent colonist. Few records, Hertfordshire and Middlesex (2004) Preys on flies. Nests in dead wood.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus distinguendus*	RDB 3		Southern Restricted	Locally frequently found. A species which is expanding its range. Preys on flies. Cavity nesting	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus elongatulus*			Universal	Frequently found. Nests in dead wood and the ground. Preys on flies.	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus megacephalus*			Universal.	Commonly found. Preys on Diptera. Dead-wood nesting species.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus nigritus*			Southern Widespread	Locally frequently found. Dead wood-nesting, a species of mature woodland. Preys on flies.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus ovalis*			Universal	Commonly found. Preys on small Diptera (Empids). Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus podagricus*			Universal	Commonly found. Hedgerows. Preys on small Diptera, especially Nematocera. Dead-wood nesting species.	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus quadrimaculatus*			Southern Widespread	Commonly found. Preys on small Diptera. Ground nesting.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus tarsatus*			Universal	Locally frequent. Ground nesting in lighter soils. Preys on flies.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Crossocerus varus*			Universal	Commonly found. Preys on small Diptera. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Diodontus luperus*			Southern Widespread	Infrequently found. Preys on aphids. Ground nesting.	0	0	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Diodontus minutus*			Southern Widespread	Commonly found in sandy places. Preys on aphids. Ground nesting.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Diodontus tristis*			Widespread.	Infrequently found. Preys on aphids. Ground nesting.	0	0	0	1	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Dryudella pinguis*			Universal.	Infrequently found. Dry, sandy places. Preys on shieldbug and Lygaeid bug nymphs. Ground nesting.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius cavifrons*			Universal.	Commonly found. Dead-wood nesting. Hunts flies.	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius cephalotes*			Universal.	Frequently found. Dead-wood nesting. Hunts flies.	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius continuus*			Universal	Commonly found in a variety of habitats. Dead-wood nesting. Preys on flies.	0	1	1	1	0	0	1	0	0	1	0	1	0	0	1	0	0	1	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius dives*	Nationally Scarce b		Southern Widespread	Local and infrequently found. This species has been increasing its range and frequency over the past twenty years. Dead wood nesting. Hunts flies.	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius lituratus*			Southern Widespread	Commonly found. Dead-wood nesting. Hunts flies.	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius rubicola*			Southern Restricted.	Infrequently found. Nests in dead bramble stems. Hunts flies.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius ruficornis*	Nationally Scarce b		Southern Widespread	Infrequently found. Possibly more specifically associated with woodland than other Ectemnius species. Dead-wood nesting. Hunts flies.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Ectemnius sexcinctus*	Nationally Scarce b		Southern Widespread	Occasional specimens, but distributed widely in southern England. Dead-wood nesting. Hunts flies.	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Entomognathus brevis*			Southern Widespread	Commonly found in sandy places. Preys on small leaf-beetles (Chrysomellidae). Ground nesting.	0	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Gorytes laticinctus*	RDB 3		Southern Restricted	Rarely found. Preys on frog-hoppers (Cicadellidae). Ground nesting.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Gorytes quadrifasciatus*			Southern Restricted	Locally frequently found.Particularly sandy places. Preys on frog-hoppers (Cicadellidae). Ground nesting.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Harpactus tumidus*			Universal	Infrequently found. Local to warm sandy places. Preys on Frog-hoppers (Cicadellidae and Cercopidae). Ground nesting.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Lestiphorus bicinctus*	Nationally Scarce b		Southern Restricted	Infrequently found and local. Preys on froghoppers (Hemiptera Homoptera)	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Lindenius albilabris*			Universal	Commonly found. Preys on Mirid bugs or sometimes small Diptera. Nests in hard-packed bare ground.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Mellinus arvensis*			Universal.	Very commonly found in sandy places. Hunts flies. Ground nesting.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Mimesa lutaria*			Southern Widespread	Commonly found in sandy places. Preys on Homopteran bugs. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Mimumesa dahlbomi*			Universal.	Frequently found. Preys on Homopteran nymphs. Dead-wood nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Mimumesa unicolor*	Nationally Scarce a		Southern Restricted	Infrequently found. A species of clay soils, where it nests in the cracks created as the soil dries out. Although largely coastal, it has also been found in clay woodland and fields, heathland and on the clay cap of the South Downs. Preys on leaf-hoppers.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Nysson dimidiatus*	Nationally Scarce b		Southern Widespread	Rarely found. Sandy localities. A cleptoparasite of Gorytes tumidus. Ground nesting.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Nysson trimaculatus*	Nationally Scarce b		Southern Widespread	Infrequently found, a cleptoparasite of Gorytes spp.	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Oxybelus uniglumis*			Southern Widespread	Very commonly found in sandy places. Preys on flies. Ground nesting.	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Passaloecus clypealis*	pRDB 3 (RDB 2 in the Red Data Book, 1987)		Southern Restricted	Rarely found. It is associated with dry reed-bed, where it nests in old stems. It is likely that it provisions its nest with aphids, as do all other members of this genus.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Passaloecus corniger*			Southern Widespread	Commonly found. May steal aphid prey from other sphecid wasps. Dead wood nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Passaloecus gracilis*			Southern Widespread	Infrequently found. Preys on aphids on herbaceous plants. Dead wood nesting.	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Passaloecus singularis*			Universal.	Commonly found. Preys on aphids. Nests in cut stems and small beetle burrows in dead wood.	0	0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Pemphredon inornata*			Southern Widespread	Commonly found. Preys on aphids. Dead-wood nesting.	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Pemphredon lethifer*			Southern Widespread	Commonly found. Preys on aphids. Nests in the soft pith of dead stems, such as bramble. The main chamber is helical down the stem, with side chambers dropping off this.	0	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	0	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Pemphredon lugubris*			Universal.	Commonly found. Preys on large aphids. Nests in dead wood, especially as this becomes dry and powdery.	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Pemphredon rugifera*	RDB 3		Universal	Infrequently found and local. A Spey Valley speciality, also known from old pine forest areas elsewhere in N. Scotland and, in complete contrast, in a number of locations in southern England! Preys on aphids. Nests in old beetle galleries.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

APPENDIX 1: Total Species List

Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Philanthus triangulum*			Southern Widespread	Locally commonly found to abundant. The 'Bee Wolf'. Preys on honeybees. Long restricted to the south coast of the Isle of Wight as a permanent breeding population, this wasp has recently undergone a rapid expansion of its range.	0	0	0	1	0	1	1	1	0	0	1	1	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Psenulus concolor*			Southern Restricted.	Frequently found. Woodland and hedgerows. Preys on Psyllid bugs (Homoptera). Dead-wood nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Psenulus pallipes*			Southern Widespread	Infrequently found. Associated with woodland and hedgerows. Preys on aphids and nests in dead wood.	0	1	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Psenulus schencki*	Nationally Scarce a		Southern Restricted	Rarely found. Nests in hollow dead stems, although scarce it seems to have no strong habitat preference. Preys on Psyllid bugs (Homoptera)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Rhopalum clavipes*			Universal	Infrequently found, partly due to its very small size. Nests in a variety of cavities in a variety of habitats. Provisions its nest with Psocoptera (book-lice), occasionally with small Diptera or Homoptera.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Rhopalum coarctatum*			Universal.	Locally frequently found. Likes damp, often shady, places. Preys on small crane-flies or book-lice . Nests in hollow stems.	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Spilomena troglodytes*			Universal.	Infrequently found, but it is very small. Nests in small beetle burrows in dead wood. Preys on thrips (Thysanoptera).	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Tachysphex pompiliformis*			Universal	Locally commonly found. Sandy places. Preys on grasshopper nymphs and adults. Ground nesting.	0	0	0	1	0	1	1	1	0	0	1	1	0	0	0	1	0	1	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Trypoxylon attenuatum*			Universal.	Commonly found. Preys on small spiders. Stem nesting.	0	1	1	1	0	1	1	1	0	1	0	0	1	1	0	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Trypoxylon clavicerum*			Southern Widespread	Commonly found. Preys on small spiders. Stem nesting.	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Crabronidae (Solitary Wasps)	*Trypoxylon medium*			Universal.	Commonly found. Preys on small spiders. Nests in stem cavities.	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Anteon exiguum*			Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Anteon flavicorne*			Universal	Frequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Anteon gaullei*			Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Anteon infectum*			Southern Widespread	Frequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Anteon reticulatum*			Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Aphelopus atratus*			Southern Widespread	Parasitises Leaf-hoppers (Cicadellidae)	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Dryinidae (Solitary Waps)	*Gonatopus bicolor*			Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Formica cunicularia*			Southern Restricted.	Locally commonly found. Southern heathland, downland and coastal localities.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Formica fusca*			Universal	Commonly found in many habitats, although largely replaced by F. lemani towards the north.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Hypoponera punctatissima*			Introduced species	Abundance:	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Lasius brunneus*	Nationally Scarce b		Southern Restricted	Locally frequently found. Nests in old trees, especially oaks.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Lasius flavus*			Universal.	Commonly found. The large, dome-shaped nests are an indicator of long-established pasture.	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Lasius fuliginosus*			Southern Widespread	Locally commonly found. It takes over colonies of other Lasius species ants, which have themselves taken over colonies of other Lasius species. Its carton nest is often found in old tree stumps.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Lasius niger s.s.*			Universal	Very commonly found. Dry habitats.	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Lasius platythorax*			Southern Widespread	Commonly found. A recently separated species, close to L. niger. Seems to prefer damp locations, often, but not exclusively, on heathlands.	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Leptothorax acervorum*			Universal	Commonly found in many habitats.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmecina graminicola*			Southern Restricted	Infrequently found. Often in the nests of other ant species, usually Lasius alienus and L. flavus.	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmica rubra*			Universal	Locally common in sheltered localities.	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmica ruginodis*			Universal	Commonly found in many habitats.	0	1	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmica sabuleti*			Universal	Locally commonly found. Short turf and bare ground.	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmica scabrinodis*			Universal	Commonly found in a variety of open habitats.	0	1	1	1	0	0	1	0	0	1	1	1	1	1	1	0	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Myrmica specioides*	RDB 3		Southern Restricted	Infrequently found. Associated with sparsely vegetated soils, often shingle or gravel. Increasing range during the 2000's.	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Pheidole megacephala*			Introduced species		0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Ponera coarctata*	Nationally Scarce b		Southern Restricted	Rarely found. Largely associated with coastal areas with warmth. Subterranean.	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Stenamma debile*			Southern Widespread	Rarely found. A recently recognised species, close to S. westwoodii. Associated with shady locations, nests under stones or logs.	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Formicidae (Ants)	*Temnothorax nylanderi*			Southern Restricted	Infrequently found and local. Nests in dead wood.	0	0	0	1	1	0	0	1	0	1	1	1	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitdae (Mining Bees)	*Halictus rubicundus*			Universal	Commonly found. A eusocial species. Ground nesting. Polylectic.	0	1	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitdae (Mining Bees)	*Halictus tumulorum*			Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.	0	1	0	1	0	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum albipes*			Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum calceatum*			Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.	0	1	1	1	0	0	1	1	0	1	0	1	0	1	0	1	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum fulvicorne*			Southern Widespread	Locally commonly found on more alkaline soils. Polylectic. Ground nesting.	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	1	1	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum lativentre*			Southern Widespread	Frequently found, especially on heathlands. Polylectic. Ground nesting.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum leucopus*			Universal	Locally commonly found. Polylectic. Ground nesting.	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum leucozonium*			Southern Widespread	Commonly found in a variety of habitats. Polylectic. Ground nesting.	0	1	1	1	0	1	1	0	0	1	0	1	0	1	1	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum malachurum*	Nationally Scarce a		Southern Restricted	Commonly found. Eusocial species which forms large colonies. Formerly, a largely coastal species. Increased its range during the 1990s,does not merit Nationally Scarce status now. Polylectic.	0	1	1	1	0	0	0	0	1	1	0	0	0	1	1	0	1	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum minutissimum*			Southern Restricted	Locally frequently found. Associated with sandy places. Polylectic.	0	1	0	0	0	0	1	0	0	0	1	1	0	1	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum morio*			Southern Widespread	Commonly found. Polylectic. Ground nesting	0	0	0	1	0	1	0	1	0	1	1	1	1	0	0	1	1	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum parvulum*			Southern Widespread	Commonly found in a variety of habitats. Polylectic.	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum pauperatum*	RDB 3		Southern Restricted	Infrequently found. Largely associated with warm areas on sandy or chalky soils. Polylectic.	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum pauxillum*	Nationally Scarce a		Southern Restricted	Commonly found. Polylectic and eusocial. Became much commoner during the 1990s, does not merit Nationally Scarce status now. Ground nesting.	0	1	1	1	0	1	1	0	0	1	0	0	1	1	1	1	1	0	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum punctatissimum*			Southern Widespread	Commonly found. Sandy places. Polylectic.	0	1	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum puncticolle*	Nationally Scarce b		Southern Restricted	Locally frequently found. A species of clay meadows and woodland rides. Polylectic. Ground-nesting.	0	1	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum smeathmanellum*			Southern Widespread	Locally common, especially associated with coastal sites. Polylectic. Ground nesting with an apparent preference for vertical faces.	0	0	0	0	0	0	0	1	0	1	1	1	0	1	1	0	0	0	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum villosulum*			Universal	Commonly found. Polylectic. Ground nesting.	0	1	1	1	0	1	1	0	0	1	1	1	0	1	1	1	1	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum xanthopus*	Nationally Scarce b		Southern Widespread	Locally frequent. Polylectic. Ground nesting.	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halicitidae (Mining Bees)	*Lasioglossum zonulum*			Southern Restricted.	Locally frequent. Polylectic. Ground nesting.	0	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes crassus*	Nationally Scarce b		Southern Widespread	Infrequently found. Has been difficult to separate from closely related species. It could well be more widespread than previously thought. Cleptoparasitic on Lasioglossum sp..	0	0	0	0	0	1	1	1	0	0	1	1	1	1	0	0	0	0	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes ephippius*			Southern Widespread	Commonly found. Cleptoparasitic on Lasioglossum sp..	0	1	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes geoffrellus*			Universal	Commonly found. Cleptoparasitic on Lasioglossum sp..	0	0	0	1	0	0	1	0	0	0	1	1	1	1	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes gibbus*			Southern Widespread	Commonly found. Cleptoparasitic on Lasioglossum and Halictus sp.., especially Halictus rubicundus.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes longulus*	Nationally Scarce a		Southern Restricted	Rarely found and local. Usually associated with sandy soils where it is a cuckoo of the mining be Lasioglossum minutum.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes miniatus*	Nationally Scarce b		Southern Restricted	Infrequently found. A heathland bee associated with very dry, light sandy habitats. Cleptoparasitic on Lasioglossum sp..	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes monilicornis*			Universal.	Commonly found. Cleptoparasitic on Lasioglossum and Halictus sp..	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1	1	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes niger*	RDB 3		Southern Restricted	Frequently found. A cleptoparasitic species. Its probable host, Lasioglossum morio, is a very common and widely distributed bee.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

APPENDIX 1: Total Species List

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes pellucidus*			Universal.	Commonly found in sandy situations where its host, Andrena barbilabris, occurs.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes puncticeps*			Southern Widespread.	Infrequently found. Cleptoparasitic on Lasioglossum sp..	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes reticulatus*	Nationally Scarce a		Southern Restricted.	Locally frequently found. Associated with grasslands on light soils. The host species are not clear, as it is found where its recorded host, Lasioglosssum prasinum, does not occur.	0	1	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes rubicundus*	Nationally Scarce a		Southern Restricted	Infrequently found. A cleptoparasite of Andrena labialis, a bee of old meadowland; it may also cleptoparasitise Andrena flavipes.	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Halictidae (Mining Bees)	*Sphecodes scabricollis*	RDB 3		Southern Restricted	Rarely found. A cleptoparasite of the much commoner bee Lasioglossum zonulus.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Anthidium manicatum*			Southern Widespread	Locally frequent, particularly in gardens. Polylectic. Cavity nesting.	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Chelostoma campanularum*			Southern Widespread.	Commonly found. Mainly associated with the flowers of Campanula spp. but may also utilise those of other, unrelated genera as pollen sources. Dead-wood nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Coelioxys conoidea*			Southern Restricted.	Locally frequently found. Cleptoparasite of Megachile maritima.	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Coelioxys rufescens*			Southern Widespread	Infrequently found. Cleptoparasite of Megachile spp. and Anthophora bimaculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Hoplitis claviventris*			Southern Widespread	Infrequently found. Uses dead bramble stems in which to make its nest. Polylectic.	0	0	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile centuncularis*			Universal	Locally frequently found. A species which has apparently declined greatly in the last hundred years. Polylectic. Cavity nesting.	0	1	0	1	0	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile leachella*	Nationally Scarce b		Southern Widespread	Locally very common. Associated with duneland sites, but also known inland on the Brecks. Ground nesting. Polylectic.	0	1	1	1	0	0	1	0	0	1	1	0	0	0	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile ligniseca*			Southern Widespread	Infrequently found. Dead-wood nesting. Polylectic.	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile maritima*			Southern Widespread	Frequently found in sandy coastal locations, although in the south of England it may occasionally occur on chalk downland and inland heaths. Polylectic. Ground nesting.	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile versicolor*			Universal	Commonly found. One of the leafcutter bees from the way it lines its nest chamber with sections of cut leaf. Any leaf will do, provided that it is supple. The sides are made from oval pieces, the ends from round ones. Cavity nesting. Polylectic.	0	0	1	1	0	0	1	0	0	1	0	1	0	1	1	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Megachile willughbiella*			Universal	Commonly found. Cavity and ground nesting. Polylectic.	0	1	1	1	0	1	1	1	0	1	0	1	1	1	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Osmia bicolor*	Nationally Scarce b		Southern Restricted	Locally frequently found. Chalk downland and open woodland on chalk and basic soils (for suitable snail-shells). This species makes its nest in empty snailshells (Helix). Polylectic, although it is particularly associated with blue-flowered labiates, together with Bird's-foot Trefoil Lotus corniculatus and Horse-shoe Vetch Hippocrepis comosa.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Osmia bicornis*			Universal.	Locally common. Cavity nesting. Polylectic.	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Osmia caerulescens*			Southern Widespread	Locally commonly found. Cavity nesting. Polylectic.	0	0	1	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Osmia leaiana*			Southern Widespread	Infrequently found. Oligolectic on Asteracea.	0	0	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Osmia spinulosa*			Southern Restricted	Locally frequently found on southern calcareous grasslands. Nest in snail-shells. Oligolectic on Asteraceae. Formerly known as Hoplitis spinulosa.	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Stelis ornatula*	RDB 3		Southern Widespread	Rarely found and local. A cleptoparasite of the stem-nesting bee Hoplitis claviventris.	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Megachilidae (Leafcutter and Mason Bees)	*Stelis punctulatissima*			Southern Widespread	Infrequently found. Often in gardens where it is as a cleptoparasite of Anthidium manicatum.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Melittidae (Bees)	*Dasypoda hirtipes*	Nationally Scarce b		Southern Widespread	Locally commonly found. Sandy areas. Oligolectic, associated with yellow Asteracea (composites). Ground nesting.	0	0	0	1	0	0	1	0	0	1	1	1	1	1	0	1	0	1	1	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Melittidae (Bees)	*Melitta leporina*	Nationally Scarce b		Southern Widespread	Infrequently found. Associated with legumes, especially White Clover, Trifolium repens. Ground nesting.	0	1	1	1	0	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Melittidae (Bees)	*Melitta tricincta*	Nationally Scarce b		Southern Restricted	Locally commonly found. Oligolectic. Very strongly associated with Red Bartsia, Odontites verna, which provides the pollen with which the female stocks her nest. Ground nesting.	0	1	1	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Mutillidae (Solitary Wasps)	*Myrmosa atra*			Southern Widespread	Frequently found. Wingless females occasionally found running over bare ground. Males can be very common in malaise trap catches. Parasite of a variety of ground-nesting bees and wasps.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Agenioideus cinctellus*			Southern Restricted	Infrequently found. A species of cracks and crevices, such as upturned root-plates. Cavity nesting.	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Anoplius infuscatus*			Southern Widespread	Locally common on damp heaths and dunes. Preys on wolf spiders (Lycosidae). Ground nesting.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Anoplius nigerrimus*			Universal.	Commonly found. A wide variety of habitats. Ground and cavity nesting.	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Aporus unicolor*	Nationally Scarce a		Southern Restricted	Infrequently found. This species preys upon the Purse-web spider, Atypus affinis. As such, it is a species of short turf and bare heathland or downland. Ground nesting, uses the burrow of the Atypus.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Arachnospila anceps*			Universal	Commonly found. Ground nesting. Preys on spiders.	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Arachnospila spissa*			Universal	Commonly found in a variety of habitats. Ground nesting.	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Arachnospila trivialis*			Southern Widespread	Infrequently found. Associated with open sandy habitats. Preys on crab spiders (Xysticus) and possibly wolf spiders (Lycosidae). Ground nesting.	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Auplopus carbonarius*	Nationally Scarce b		Southern Widespread	Rarely found. Old woodland, but also on walls and buildings. Often found exploring tree-trunks for spiders. Nests in cavities, including brickwork and banks. Makes cells of mud.	0	0	0	1	1	1	1	1	0	1	0	0	0	0	1	1	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Caliadurgus fasciatellus*			Southern Widespread	Frequently found. Thought to be uncommon generally although it is a species which I take regularly in malaise traps in sandy-clay woodland situations. Males of this species are often the commonest pompilid in such traps. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Dipogon variegatus*			Universal.	Infrequently found. Known to nest in empty snail shells. Cavity nesting. Preys on Thomisidae.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Episyron rufipes*			Southern Widespread	Locally commonly found in loose, sandy situations on heaths and dunes. Preys on orb spiders. Ground nesting.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Evagetes crassicornis*			Universal.	Commonly found, especially in sandy places. A cleptoparasite on other pompilids.	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis agilis*	Nationally Scarce b		Southern Restricted	Infrequently found. A species of short, dry grasslands. Ground nesting.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis confusor*	Nationally Scarce b		Southern Widespread	Infrequent and uncommon. A species of clay soils. Coastal, especially in the south and east of England. Ground nesting.	0	0	0	1	0	0	1	0	0	1	0	1	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis cordivalvata*	Nationally Scarce b		Southern Widespread	A species of rides in mature broadleaf woodland, occasionally coppice. Ground nesting.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis exaltata*			Universal.	Commonly found. Ground nesting.	0	0	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis fennica*			Universal	Commonly found. Ground nesting. Often found in wet places.	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis parvula*			Universal	Very commonly found in sandy localities, frequent elsewhere. Ground nesting. Preys on spiders.	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis perturbator*			Universal.	Frequently found. Particularly associated with woodland. A spring species. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis pusilla*			Southern Widespread	Infrequently found. Associated with lighter soils. It seems to be a more westerly species in the south of England. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Pompilidae (Spider-hunting Wasps)	*Priocnemis schioedtei*	Nationally Scarce b		Universal.	Infrequently found. A species of woodland edges. Ground nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Sapygidae	*Sapyga quinquepunctata*			Southern Widespread	Infequently found, but may be locally common. A cleptoparasite of various Megachilid bees. A more southerly species.	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0

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190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Sphecidae (Solitary Wasps)	*Ammophila sabulosa*			Southern Widespread	Commonly found. Associated with sandy, and many coastal, localities. Hunts caterpillars. Ground nesting.	0	1	1	1	0	1	1	1	0	1	1	1	0	0	0	1	0	0	0	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Tiphiidae (Solitary Wasps)	*Tiphia femorata*			Southern Restricted.	Locally commonly found. Sandy places. Parasitises larvae of scarabaeid beetles.	0	1	1	1	0	1	1	0	0	1	0	1	1	0	1	0	0	1	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Tiphiidae (Solitary Wasps)	*Tiphia minuta*	Nationally Scarce b		Southern Restricted	Local but can be frequently found, particularly in malaise traps. Preys on larvae of dung beetles.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Ancistrocerus gazella*			Southern Widespread	Commonly found. Nests in a variety of cavities. Provisions its nest with small caterpillars.	0	1	1	0	0	1	0	1	0	1	0	0	0	1	0	1	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Ancistrocerus parietum*			Universal.	Infrequently found. Preys on lepidopteran larvae.	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Ancistrocerus trifasciatus*			Southern Widespread	Commonly found. Nests in a variety of cavities. Provisions its nest with small caterpillars.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Dolichovespula saxonica*	RDB K		Southern Restricted.	Becoming frequently found, particularly in heathy locations, does not merit Nationally Scarce status now. A recent colonist in Great Britain, widely spread below a line from Hampshire to Norfolk. It is easily confused with the very common D. sylvestris and is probably greatly under-recorded. Aerial nesting.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Dolichovespula sylvestris*			Universal	Commonly found. Aerial nesting.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Order	Family	Species	Cons Status	S41 (May 2014)	Distribution	Abundance	RU1 Saltmarsh	RU2 combined	RU3 combined	RU4 combined	RU5 Wood s of BDM	RU6 grassland s of Wood by BDM	RU7 combined	RU8 CTRL wetland	RU9 Botany Marshes west	RU10 Botany Marshes east	RU11 Manor Way	RU12 Craylands Pit	RU13 Sports Field	RU14 Bamber pit	RU15 Northfleet Landfill	RU16 A226 Triangle	RU17 CTRL Car Parks	RU18 CTRL car park D	RU19 North Springhead	RU20 A2 Corridor
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Gymnomerus laevipes*			Southern Restricted.	Locally frequently found. The nest is made in a hollowed out, dead, bramble stem, the partitions are mud, hence a potter wasp. Seems to like woodland edges. Provisions nest with weevil larvae (Hypera).	0	0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Odynerus melanocephalus*	Section 41	S41	Southern Restricted.	Locally frequent. BAP species. Preys on weevil larvae, Hypera. Ground nesting.	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Odynerus spinipes*			Southern Widespread.	Erratic but can be commonly found in a locality. Can apparently suddenly appear after many years' absence- and then disappear. Makes large colonies on exposed banks. Each nest entrance is formed in the shape of a long chimney curving away from the bank. Preys on weevil larvae, Hypera.	0	1	0	1	0	0	1	0	0	0	0	1	0	0	1	0	1	1	0	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Symmorphus bifasciatus*			Southern Widespread	Locally frequently found in damp places. Nests in aerial cavities and dead wood. Provisions nest with larvae of leaf betles (Chrysomelidae).	0	1	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Vespula germanica*			Universal	Very commonly found. Underground and cavity nesting.	0	0	0	1	0	0	0	1	0	1	1	1	0	0	1	1	1	1	1	1
190 ACULEATE HYMENOPTERA (Ants, Bees and Wasps)	Vespidae (Social and Potter Wasps)	*Vespula vulgaris*			Universal	Very commonly found. Underground and cavity nesting.	0	0	0	1	0	0	1	1	0	1	0	0	1	1	0	0	0	1	1	1

APPENDIX 2

Conservation Status Tables

APPENDIX 2: Conservation Status Tables

Table 1 Total species and species with a conservation status by area

Status	1 Saltmarsh	2 Broadness	3 Sea-walls	4 Black Duck Marsh - malaise traps and ditches	5 Woodland	6 Grassland south of woodland	7 Swanscombe Peninula Centre 2012 + 2015	8 CTRL Wetland - malaise traps	9 Botany Marshes West	10 Botany Marshes East	11 Manor Way	12 West Quarry/ Crayland's Lane Pit	13 East Quarry/ Sports Field	14 Bamber Pit	15 Northfleet Landfill	16 A226 Triangle	17 CTRL Car Parks	18 CTRL	19 North of Springhead Nursery	20 A2 Corridor	Swanscombe Peninsula (Areas 1-10)	Non Peninsula (Areas 11-20)	All areas (Areas 1-20)
RDB1	0	2	1	1	0	2	2	0	0	1	1	2	2	3	1	1	1	1	2	0	3	3	3
RDB2	0	0	1	2	0	0	1	1	0	1	0	2	0	0	0	0	0	3	1	0	4	4	7
RDB3	3	8	4	9	1	4	12	4	0	4	2	5	4	5	8	3	0	6	6	2	27	17	31
RDB K	0	2	2	3	0	1	4	2	0	2	2	2	2	1	2	1	0	3	0	1	8	6	9
Total RDB	3	12	8	15	1	7	19	7	0	8	5	11	8	9	11	5	1	13	9	3	42	30	50
Nationally Scarce (NS)	4	48	42	55	8	26	78	26	10	34	15	45	19	41	29	19	10	30	44	5	159	121	203
Total RDB + NS	7	60	50	70	9	33	97	33	10	42	20	56	27	50	40	24	11	43	53	8	201	151	253
S41	3	12	7	6	0	4	10	2	1	2	4	5	4	6	4	2	2	5	6	1	16	9	16
Total spp. recorded	49	537	327	558	194	293	857	403	80	528	182	523	262	530	374	297	152	388	615	80	1641	1314	1993

Table 2 Total species and species with a conservation status by area, adjusted for currently unsupported status

Status	1 Saltmarsh	2 Broadness	3 Sea-walls	4 Black Duck Marsh - malaise traps and ditches	5 Woodland	6 Grassland south of woodland	7 Swanscombe Peninula Centre 2012 + 2015	8 CTRL Wetland - malaise traps	9 Botany Marshes West	10 Botany Marshes East	11 Manor Way	12 West Quarry/ Crayland's Lane Pit	13 East Quarry/ Sports Field	14 Bamber Pit	15 Northfleet Landfill	16 A226 Triangle	17 CTRL Car Parks	18 CTRL	19 North of Springhead Nursery	20 A2 Corridor	Swanscombe Peninsula (Areas 1-10)	Non Peninsula (Areas 11-20)	All areas (Areas 1-20)
RDB1	0	1	0	1	0	2	2	0	0	0	0	1	1	2	1	1	0	1	1	0	2	2	2
RDB2	0	0	1	2	0	0	1	1	0	1	0	2	0	0	0	0	0	3	1	0	4	4	7
RDB3	3	4	3	5	1	2	7	3	0	1	0	3	2	2	7	1	0	2	2	0	19	10	21
RDB K	0	2	2	2	0	1	4	2	0	2	2	2	2	1	2	1	0	2	0	1	7	5	8
Total RDB	3	7	6	10	1	5	14	6	0	4	2	8	5	5	10	3	0	8	4	1	32	21	38
Nationally Scarce (NS)	3	38	34	45	4	19	68	20	5	28	14	40	13	35	22	17	7	23	41	3	144	109	187
Total RDB + NS	6	45	40	55	5	24	82	26	5	32	16	48	18	40	32	20	7	31	45	4	176	130	225
S41	3	12	7	6	0	4	10	2	1	2	4	5	4	6	4	2	2	5	6	1	16	9	16
Total spp. recorded	49	537	327	558	194	293	857	403	80	528	182	523	262	530	374	297	152	388	615	80	1641	1314	1993

Note: An immature spider, considered extremely likely to be of the Section 41 *Sitticus distinguendus* , was found in the area behind the jetty (7 Swanscombe Peninsula Centre). However, owing to the uncertainty associated with the identitification of juvenile spiders generally, this record has not been included.

Table 3 Species with a conservation status by association with wet or humid habitats for Black Duck Marsh, CTRL Wetland and Botany Marshes East

	4 Black Duck Marsh - malaise traps and ditches					8 CTRL Wetland - malaise traps					10 Botany Marshes East				
Status	Total	Wet	Humid	Wet + Humid	% W + H	Total	Wet	Humid	Wet + Humid	% W + H	Total	Wet	Humid	Wet + Humid	% W + H
RDB1	1	0	0	0	0	0	0	0	0	n/a	1	0	0	0	0
RDB2	2	1	1	1	50	1	0	1	1	100	1	0	0	0	0
RDB3	9	0	0	0	0	4	1	2	2	50	4	0	0	0	0
RDB K	3	0	0	0	0	2	0	0	0	0	2	0	0	0	0
Total RDB	15	1	1	1	7	7	1	3	3	43	8	0	0	0	0
Nationally Scarce (NS)	55	10	2	12	22	26	5	5	10	38	34	1	5	6	18
Total RDB + NS	70	11	3	13	19	33	6	8	13	39	42	1	5	6	14
S41	6	0	0	0	0	2	0	0	0	0	2	0	0	0	0
Total spp. recorded	558	60	33	81	15	403	54	72	117	29	528	52	16	47	9

Table 4 Species with a conservation status, adjusted for currently unsupported status, by association with wet or humid habitats for Black Duck Marsh, CTRL Wetland and Botany Marshes East

	4 Black Duck Marsh - malaise traps and ditches					8 CTRL Wetland - malaise traps					10 Botany Marshes East				
Status	Total	Wet	Humid	Wet + Humid	% W + H	Total	Wet	Humid	Wet + Humid	% W + H	Total	Wet	Humid	Wet + Humid	% W + H
RDB1	1	0	0	0	0	0	0	0	0		0	0	0	0	n/a
RDB2	2	1	1	1	50	1	0	1	1	100	1	0	0	0	0
RDB3	5	0	0	0	0	3	1	2	2	67	1	0	0	0	0
RDB K	2	0	0	0	0	2	0	0	0	0	2	0	0	0	0
Total RDB	10	1	1	1	10	6	1	3	3	50	4	0	0	0	0
Nationally Scarce (NS)	45	9	2	11	24	20	4	4	8	40	28	1	4	5	18
Total RDB + NS	55	10	3	12	22	26	5	7	11	42	32	1	4	5	16
S41	6	0	0	0	0	2	0	0	0	0	2	0	0	0	0
Total spp. recorded	558	60	33	81	15	403	54	72	117	29	528	52	16	47	9

Table 5 Species unique to sample site, by conservation status

Status	2 Broadness	3 Sea-walls	4 Black Duck Marsh - malaise traps and ditches	7 Swanscombe Peninula Centre 2012 + 2015	8 CTRL Wetland - malaise traps	12 West Quarry/ Crayland's Lane Pit	14 Bamber Pit	15 Northfleet Landfill	18 CTRL	19 North of Springhead Nursery
RDB1	0	0	0	0	0	0	0	0	0	0
RDB2	0	0	2	0	1	0	0	0	2	0
RDB3	0	0	1	0	2	0	1	0	0	1
RDB K	0	0	0	0	0	0	0	1	1	0
Total RDB	0	0	3	0	3	0	1	1	3	1
% of total RDB	0	0	20	0	43	0	11	9	23	11
Nationally Scarce (NS)	11	8	15	21	8	11	7	4	6	14
% of total NS	23	19	27	27	31	24	17	14	20	32
Total RDB + NS	11	8	18	21	11	11	8	5	9	15
% of total RDB + NS	18	16	26	22	33	20	16	13	21	28
S41	3	0	1	1	0	0	0	0	0	0
Of total spp. recorded	88	36	117	185	79	64	68	39	39	122
Total spp. recorded	537	327	558	857	403	523	530	374	338	615
% of total	16	11	21	22	20	12	13	10	12	20

Table 6 Species unique to sample site, by conservation status, adjusted for currently unsupported status

Status	2 Broadness	3 Sea-walls	4 Black Duck Marsh - malaise traps and ditches	7 Swanscombe Peninula Centre 2012 + 2015	8 CTRL Wetland - malaise traps	12 West Quarry/ Crayland's Lane Pit	14 Bamber Pit	15 Northfleet Landfill	18 CTRL	19 North of Springhead Nursery
RDB1	0	0	0	0	0	0	0	0	0	0
RDB2	0	0	2	0	1	0	0	0	2	0
RDB3	0	0	1	0	2	0	1	0	0	0
RDB K	0	0	0	0	0	0	0	1	1	0
Total RDB	0	0	3	0	3	0	1	1	3	0
% of total RDB	0	0	30	0	50	0	20	10	38	0
Nationally Scarce (NS)	10	8	14	20	6	11	7	4	6	14
% of total NS	26	24	31	29	30	28	20	18	26	34
Total RDB + NS	10	8	17	20	9	11	8	5	9	14
% of total RDB + NS	22	20	31	24	35	23	20	16	29	31

APPENDIX 3

Species Area Comparison Sites

APPENDIX 3: Species Area Comparison Sites

Site	Area (ha)	Spp	RDB spp	NS spp	RDB + NS	SSSI	Comments
Canvey Wick	93	1450	32	120	152	Yes	Area from SSSI citation. Spp numbers from - Buglife case study - 'at least 1400 spp and.....30 RDB spp'. Buglife web-page and other sources give RDB as 30. SSSI citation states 31 (29RDB1-3 + 9 RDBk +Ae), State of Brownfields in the Thames Gateway rpt states 32 RDB & 120 NS. These last have been used.
Paramount	230	1993	50	204	254	No	Area incl. +/- all Peninsula + sum of surveyed non-Peninsula sites
Hadleigh MBV	60	419	10	33	43	No	2 survey areas, west & east. East surveyed only once in Aug, west several times April-Aug. Includes little or no wetland and much improved gslnd
Hadleigh legacy	24	465	6	50	56	Most	Several survey areas, mostly grassland with scrub. Little or no wetland though grazing marsh adjacent
West Thurrock	39	1243	35	116	151	Part	Sourced from survey report by Peter Harvey 2005. Total spp from survey = 939, recorded since 1996 = 1243. 12 visits, though not all of site surveyed on each visit
Chafford Hundred	36	816	20	50	70	Part	Sourced from survey report by Peter Harvey 2014. Comprises number of +/- adjacent sites. Some uncertainty for area but likely to be minor. Survey effort was variable between diffierent component sites (4 areas 2 x 7 visits, 1 x 2 visits & 1 x 1 visit).
Untidy Industries, Basildon	7	595	9	41	50	No	Total spp from Buglife Case Study - 'more than 590 spp'. RDB & NS spp sourced from LWS citation
Hamptons, Peterborough	2	403	2	13	15	No	Created OMH site in 2007. Sourced from Buglife/BSG survey report. Surveyed 2014 through season
Eastern Quarry	220	579	6	59	65	No	Sourced from ES (Dartford planning portal). Likely to be an underestimate, due to insufficient survey? Also condition of quarry at time (2003) while still actively worked, i.e. much bare ground
Howbury West Kent (Erith/Crayford)	60	433	11	26	37	No	Sourced from invert survey (5 visits June-Sept) report by Colin Plant Assoc. 2015 - as part of planning app.
Barking Riverside	140	478	4	24	28	No	Sourced from ecological report. Invert survey carried out by Colin Plant Assoc. 3 visits - May, June, July
Thurrock Thameside Nature Park	43	510	11	48	59	No	Sourced from survey report by Peter Harvey 2014. 7 visits focues on 4 smaller areas within overall site (much of site spp-poor gslnd)

Annex EDP 29
2012 Terrestrial Invertebrate Survey Supplementary Report (Spiders [Araneae] and related groups) (CBA, 2012)

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London Resort Company Holdings
(LRCH) Ltd.

London Paramount

2012 Terrestrial Invertebrate Survey Report

October 2012

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London Resort Company Holdings (LRCH) Ltd.

London Paramount

2012 Terrestrial Invertebrate Survey Report

Approved	[redacted]
	Bill Wadsworth
Position	Senior Associate (Ecology)
Date	31st October 2012
Revision	FINAL

CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings (LRCH) Ltd. to undertake a series of ecological surveys to inform the Environmental Impact Assessment for the proposed London Paramount development at Swanscombe, North Kent. This report details the results of the terrestrial invertebrate surveys undertaken between March and September 2012.

1.2 Aims

1.2.1 The aims of the survey were to identify and evaluate the the invertebrate species and communities present that could potentially be affected by the proposed development.

1.3 The Site

1.3.1 The proposed development site occupies an area that runs from the current industrial units at Manor Way, Swanscombe, northwards to the Thames, in grid squares TQ6075 and TQ6076. The terrestrial invertebrate survey brief included a survey and comparison of this area with an area to the west in grid square TQ5975, running along the recently re-profiled sea wall.

1.3.2 For the purposes of this survey, the proposed development area was divided into a northern section (bounded by the access track to the small boat yard on the edge of the Thames) and a southern section. These areas were called Swanscombe North (allocated grid TQ605765) and Swanscombe South (allocated grid TQ605760). In addition the 'comparison area' was called Swanscombe West (allocated grid TQ597755) - see **Figure 1.**

1.3.3 Parts of the proposed development site have been quarried for chalk for the cement works in the past, and considerable parts of the quarried and marsh areas central to the Swanscombe Peninsula have been tipped with fly ash.

1.3.4 A large area of Swanscombe South appears to have been used for washing out mobile cement mixers and the drainage here is rather impeded. A considerable proportion of the rest of Swanscombe South was fenced off and hence not accessed for the survey.

1.3.5 It was considered that the readily accessible sections would supply enough data for overall assessment of the site without the additional constraint of getting access and, possibly, escort for the fenced-off areas. There would not have been enough time on survey rounds to visit all areas thoroughly in any case and a degree of selectivity over site selection at each visit was inevitable.

1.3.6 The sea-wall has fairly recently been re-aligned and heightened. Only a small amount of fly ash had been tipped on the marshes on this western side, and, apart from the lack of grazing (they are now very isolated from any other farmland and rather small) these must provide a fairly good representation of the original condition of the Swanscombe Marshes peninsula.

1.3.7 The division between Swanscombe North and Swanscombe South was decided in order to assess whether a significant proportion of species were unique to either area, with Swanscombe West as a control for the wider fauna of the area. This information would be of importance in informing decisions regarding likely enhancement areas for the conservation of the faunal interest of the site.

1.3.8 Additional areas in the overall extent of interest for the proposed developement have been previously surveyed as part of the decommissioning of the Cement Works (Northfleet Cement

Works 2008, Baker Shepherd Gillespie). Whilst no direct comparison of these areas was made as part of the current survey it would be possible to do this with the agreement of the commissioning parties. The areas of highest entomological interest in this context are shown on **Figure 1** as well as the three survey areas for the current project.

2.0 METHODOLOGY

2.4.1 The survey was undertaken by invertebrate specialists Mike Edwards (Edwards Ecological Services Ltd.) and Peter Hodge.

2.4.2 Mike Edwards focused on surveying Hymenoptera aculeata (Ants, Bees and Wasps); some Diptera groups - Bibionidae (St Mark's Flies), Larger Brachycera (Robberflies and allies), Syrphidae (Hoverflies); Sciomyzidae (Snail-killing Flies) and Tipulidae (Craneflies); Orthoptera (Grasshoppers and Crickets).

2.4.3 Peter Hodge focused on surveying Hemiptera-homoptera (Hopper bugs only); Hemiptera-heteroptera (Bugs); Coleoptera (Beetles); Lepidoptera (Butterflies and Moths - day-flying groups only); some Diptera (Empididiae, Dolichopidae, Tephritidae (Picture-wing Flies).

2.4.4 Species from other insect groups were recorded as seen and recognised.

2.4.5 Survey visits took place in good recording conditions on the following seven occasions:

- 23/3/2012 (ME only)
- 11/04/2012; 15/06/2012; 27/06/2012; 23/07/2012; 14/08/2012; 21/09/2012 (ME and PH)

2.4.6 No visit was made during May as the weather conditions were not suitable in this month; appropriate seasonal coverage was obtained by undertaking visits early and late June.

2.4.7 Insects were recorded by a mix of direct observation and sweep netting. Voucher specimens of rare or difficult to distinguish species were retained for subsequent examination/confirmation in the laboratory.

2.4.8 As already noted, time constraints meant that sampling had to be selective on each visit. Swanscombe West was consistently surveyed on each occasion, with a two-hour sample being taken each afternoon. Effort was concentrated in Swanscombe North or South during alternate visits, with approximately 2.5 and 1 hour morning searches on each section per visit. Suction samples were taken in suitable locations over all the sample areas in June and September, the data from these samples has been combined with the rest of the samples. No water samples were taken for aquatic insects, although some insects with aquatic associations were recorded in the general samples.

3.0 RESULTS

3.1 Swanscombe North

3.1.1 This area is shown in more detail in **Figure 2**, where it can be seen to be of approximately equal area to Swanscombe South. The majority of both of these areas was old fly ash tip with some ditches/open water fringed by stands of Common Reed *Phragmites australis*. There is a narrow border of saltmarsh vegetation along the boundary with the River Thames. Considerable seepage of yellowish effluent from the tipping is present in both fresh and brackish situations.

3.1.2 Small areas where soil had been moved about subsequent to the main tipping (**Image 1**) and/or where gentle disturbance due to walkers forming paths (**Image 2**) were of high significance for both aculeate Hymenoptera and phytophagous Coleoptera. This was due to both the creation of areas of bare and re-vegetating ground as a physical feature, and to the presence of a diverse flora associated with these areas. Suction samples were taken on these patches.

3.1.3 Much of the fly ash infill was covered in mature, dense, tall grassland with fairly mature scrub growth. Some areas had clearly had scrub removed in the fairly recent past as the bushes were uniformly shorter, probably by the simple expedient of bull-dozing, and not for conservation-minded purposes (**Images 3, 4 ,5**). These areas were, likewise, much richer in plants and insects than the older, less disturbed grasslands.

3.1.4 The reed-fringed edges of the water-courses here were swept on survey visits but were of little interest, possibly because the water quality itself looked to be very low. One interesting species was discovered by careful inspection of the old cigar galls on the reed stems, the yellow-faced bee *Hylaeus pectoralis*.

Image 1 A small area at the north-western end of Swanscombe North. Here spoil from elsewhere had been recently moved about, providing good nest sites for aculeates and forage resources for both these insects and phytophagous Coleoptera.

Image 2 Similar processes of intermittent disturbances, this time provided by passing walkers and push-bikes along the Thamesside path, also provided good habitat for aculeate Hymenoptera and phytophagous Coleoptera.

3.1.5 The female of this bee hollows out the old larval chamber caused in the flowering stem of reed by the gall-forming fly *Lipara lucens* and uses this as a nest chamber. It can therefore only use reed stems which are more than one year old. Originally thought to be confined to the Broads, it has proved to be more widespread, although a strict wetland habitat specialist. Although not recorded in Swanscombe West it is likely to be present here too.

3.1.6 The other wetland habitat present, that of the brackish saltmarsh, notably around the small creek, also had a number of specialist insects associated with it, despite its small area and the poor quality of parts of it, probably due to seepage from the tipping. These included the BAP mining bee *Colletes halophilus* which collects its pollen exclusively from the flowers of Sea Aster *Aster tripolium* and is only found along the coasts of the English Channel in the whole world (**Image 6**). This bee nests in small areas of dry bare ground close to its food plant. The bee was also found in the Swanscombe South and West samples.

Image 3 Tall grassland with maturing scrub, fairly typical of much of the old Fly Ash tip.

Image 4 Intermittent disturbances of the grassland provided more diversity of ecological niche. This strip alongside one of the trackways had probably been bull-dozed for some reason in the fairly recent past. It is unlikely that cutting alone would have made the differences seen here.

Image 5 This area was occasionally flooded as evidenced by the water held on it after some of the heavy summer rain of 2012. Part of it had also been burnt the year before.

Image 6 The mining bee *Colletes halophilus* at its only pollen source, the flowers of Sea Aster.

3.1.7 Another saltmarsh specialist found here was the large soldier fly *Stratiomys singularior* (**Image 7**), whose larva live in the wet mud and small pools of the saltmarsh and associated ditches. Although only recorded in this sample area it might reasonably be expected in Swanscombe West as well.

Image 7 *Stratiomys singularior* is a large and fairly arresting soldier fly associated with saltmarsh and brackish ditches.

3.2 Swanscombe South

3.2.1 As noted above, a considerable part of Swanscombe South was fenced off, whilst the most extreme southern section, around the exit point for the Cross-Channel Rail Link, was extensive wet reedbed. Access to both these areas was not straightforward and they were not surveyed.

3.2.2 This left a roughly equivalent area of similar composition to be compared with the Swanscombe North area in order to establish whether there were likely to be major differences in faunal composition between Swanscombe North (more likely to be suitable for use as a habitat enhancement area) and the rest of the site, which has been proposed for development. **Image 8** gives an overall view of the mature grassland and wetland components and **Image 9** the more skeletal component.

3.2.3 This skeletal area was initially expected to be of high value for a range of aculeate Hymenoptera and phytophagous beetles similar to those found in what appeared to be similar situations in the Swanscombe North sample. However despite careful searches and suction sampling, the area did not appear to be of high value for these invertebrate groups. This may be explained by flooding, which occured after a spell of very heavy rain in the middle of the survey period and lasted for several weeks.

3.2.4 What was initially considered to be a layer of bare, if rather hard, chalk left after quarrying activity was not this at all, but probably the residues from washing out ready-mix cement mixers. The clue was present all along with the presence of a number of small areas of open water in this area, something which would have been extremely unlikely on mineral chalk, unless at the water-table, which it clearly was not.

Image 8 Much of Swanscombe South was tall mature grassland, with small ditches and bodies of open water fringed by reeds.

Image 9 A large area on the western edge of the sample zone was of a much more skeletal structure where, it appears, Readymix cement mixers had been washed out, creating a layer of fairly impervious chalky material.

3.2.5 The main interest of this area was along the edges where occasional disturbances had, as elsewhere on site, encouraged the development of a legume-rich sward, including stands of Kidney Vetch *Anthyllis vulneraria* (**Image 10**), Red Clover *Trifolium pratense* and Meadow Vetchling *Lathyrus pratensis*. These plants were well visited by a number of bee species, including frequently by the BAP bumblebee *Bombus humilis* (**Image 11**). As on other nearby sites the Bumblebee *Bombus sylvarum* was not present, this species now seems to be limited in the Thames Estuary to areas east of Tilbury.

3.2.6 The other, smaller, areas of bare and re-vegetating ground, mainly along trackways did prove to hold a similar fauna to the North Swanscombe sample. Interesting examples of this fauna include the weevil *Sibinia arenariae* (**Image 12**), found under plants of Sea Spurrey *Spergularia* spp. growing along the trackway being sampled with a suction sampler in **Image 13**. This weevil was not recorded in either of the other compartments, but is considered likely to be present if enough plants were to be searched.

Image 10 The more broken-up edges of this area supported good stands of legumes, such as this Kidney Vetch, which was popular with queens of the bumblebee in **Image 11.**

Image 11 The bumblebee *Bombus humilis*.

Image 12 The tiny weevil *Sibina arenariae* was found by searching the ground under one of its food plants, Sea Spurrey. This plant was growing along the trackway being suction-sampled in **Image 13.**

Image 13 Using a suction sampler to help find small insects in short vegetation. This technique is much more time-efficient for recording small beetles and bugs than hand-searching. However, as with *Sibina arenariae* in **Image 12,** it is worth doing both techniques during a survey.

3.2.7 Another insect found associated with these areas in all sample areas was the potter wasp *Odynerus melanocephalus*, another BAP species. **Image 14** shows a female wasp at the mud tower typical of this species and carrying a small green larva of the weevil *Hypera postica*, which is the prey of this species. The weevil is also associated with these areas of fairly sparse vegetation as it feeds on trefoils and medicks growing in them.

3.2.8 There was no saltmarsh component to this sample area and the margins of the ditches produced little of note beyond a nest of the yellow-faced bee *Hylaeus pectoralis* (see 3.1.5).

3.3 Swanscombe West

3.3.1 This area (**Figure 3**) was not under consideration for development at the time of survey, but was included both to provide some idea of where species recorded in the other areas were as well and to provide some information regarding the likely value of similar river defence/management works as potential enhancement areas for the overall site.

Image 14 This potter wasp *Odynerus melanocephalus*, which was found nesting on all three sample areas, is much better than us at finding its particular prey, the larvae of the weevil *Hypera postica*. The paralysed prey (green) can just be seen being carried into the low mud 'chimney' at the entrance to the wasp's nest.

3.3.2 The area had examples of all the broad habitat types present in the North and South samples, some of which were being maintained by deliberate management strategies, and others which were examples of incidental, but very valuable, consequences of previous use. The components and their location is indicated on **Figure 3**.

3.3.3 In this later category comes, almost inevitably, the skeletal vegetation component which is so important in the rest of the site. This is not surprising as most management outcomes are aimed at a 'complete' end point - a wood or permanent grassland perhaps. The skeletal vegetation structure, with its matrix of bare ground and intermittent vegetation is, in these terms, an incomplete outcome going towards somewhere and requires a rather different approach to its maintenance.This point will be returned to in section 4 of this Report which suggests some ideas for mitigation management strategies.

3.3.4 The main area with this component was on the approach to the old wharf (**Image 15)**, although there was also a small area of fairly recently tipped, or re-distributed, fly ash on the landward side of the road at the eastern end of this sample area (**Image 16**). This latter area provides a good example of a fairly recently disturbed area which is approaching the point at which some further disturbance would be required to re-start the important successional process.

Image 15 This area of well-drained, skeletal vegetation is typical of several areas on the overall survey area. It owes its physical structure to the lumpy, rubble-like material which had been put here, probably to aid loading movements associated with the wharf, but elsewhere as an unintended consequence of industrial use. Such areas are very warm and usually well-drained (although sub-surface compaction can alter this) with an invertebrate fauna more often found associated with sand-dune systems.

Image 16 Also with an unintended ecological consequence of industrial use, the pulverised fly ash which has been tipped here is often rather less well-drained, but also has physical and chemical properties more often associated with sand dune systems. Ironically, this 'industrial waste', often dumped on top of wet grazing marsh, has provided excellent invertebrate habitat in several places along the Thames - of a completely different nature than the original habitat and owing much of its interest to the insects originally associated with the gravel terraces to the north of the river- now largely quarried away.

3.3.5 The fauna recorded here was similar to that found on this sort of habitat component elsewhere on site.

3.3.6 The saltmarsh component was larger here than on the Swanscombe North area and without modification through effluent from fly-ash tipping (**Image 17**). It held a number of important saltmarsh insects and is of high value as a remnant of a formerly much more widespread component of the tidal/brackish Thames in London, despite its small size. These include the mining bee *Colletes halophilus* (see 3.1.6), the weevil *Mecinus collaris* which make a gall in the flower head of Sea Plantain *Plantago maritima* and the plant hoppers *Aphrodes aestuarinus* and *A. aestuarius*, both of which are associated with Shrubby Seablite *Suaeda maritima*.

3.3.7 The old sea-wall had been left after the (re?)building of the new wall and a, low-lying area of occasionally inundated grassland and incipient reed bed now lies between the two walls (**Image 18**). Both this area and the grasslands of the re-profiled sea wall were being managed on a cyclical cutting basis (**Images 18, 19, 20, 21**).

3.3.8 The outcome of this has been an overall good continuity of forage resources for associated insects and a varied plant community. Most of the insects associated with the grasslands on all the sample sites were recorded on these grasslands too. This area provides a good example of part of an overall management enhancement strategy for the entire site.

Image 17 The saltmarsh component, although not large in extent, still held a good representation of typical saltmarsh species.

Image 18 The occasionally inundated grassland lying between the old and new sea walls. Image taken in August. Note the highly floriferous grassland.

Image 19 The same area as in **Image 18** after cutting in June. Not all the grassland had been cut at the same time however- as shown in **Images 20** and **21** below.

Image 20 An area of longer grassland left on the sea wall. This has maintained forage resources for a wide variety of insects, whilst also meeting wider management constraints.

Image 21 An area of longer grassland left on the sea wall. This has maintained forage resources for a wide variety of insects, whilst also meeting wider management constraints.

4.0 EVALUATION

4.1 Habitats

4.1.1 Part of the site was originally a chalk outcrop which has been quarried away for making cement. In places the chalk bedrock is still present, making a well-drained, calcareous skeletal substrate. Most of the area, however, is more recent than this chalk, being derived from the extensive tipping of pulverised fly ash (PVA) on former grazing marsh during the latter part of the last century. This in-filing has, in most areas, brought the land surface well above the natural water level and has given rise to a generally well-drained, calcareous soil. This is often droughted, although subsequent compaction or addition of cement wastes have made some areas more liable to retain local surface water.

4.1.2 As the site was filled different areas would have been disturbed in turn as the overall level was increased. This disturbance served to rotationally create areas of re-colonising grassland, with plenty of open spaces - an analogue of the calcareous grassland developed on deeper soils such as those on much of Salisbury Plain Training Area (especially where light tank training has been carried out) or some of the upper sections of the North and South Downs. These taller grasslands are different in structure and composition to the short turf which develops, especially under hard grazing pressure, on areas of exposed chalk bedrock or steep slopes on chalk and, whilst sharing many of the same species, are different in their overall invertebrate fauna.

4.1.3 Succession to scrub and woodland is retarded by the droughted nature and low-nutrient status of the substrate. The regular, cyclical disturbance has had a further restricting influence - this is probably what happened relatively recently in the areas shown in **Images 4** and **16**. This sort of fairly dramatic, cyclical re-profiling of the habitat is of high value for invertebrates.

4.1.4 More recently the management of the grassland along the re-built sea wall on Swanscombe West gives an excellent example of the sort of cyclical mowing regime which helps maintain a plant-rich sward (**Photos 18-20**), although this could be enhanced through the removal of the arisings.

4.1.5 Swanscombe North (**Figure 1**) is of particular note as it holds a very wide representation of the fauna present and, importantly, serves to also buffer the small but significant river-side salt-marsh habitats.

4.2 Species

4.2.1 The total number of species recorded, by sample area and recognised conservation significance are presented in **Table 1**.

4.2.2 The individual species listed as being of conservation significance and an evaluation of this significance at a regional and national level forms **Table 2**.

Table 1 Total Number of Species Recorded on Site

Sample Area	Total No. Species	No. Species Considered Significiant	No. Species Unique to that Area	No. Species Considered Significiant
All areas	479	80	-	-
Swanscombe North	327	49	145	26
Swanscombe South	208	26	63	11
Swanscombe West	219	36	75	19

Table 2 Species of Conservation Significance Recorded on Site

Key: N = Found in Swanscombe North
S = Found in Swanscombe South
W = Found in Swanscome West
Status = Current conservation status
LS = Local Significance
NS = National Significance

Species	N	S	W	Status	Comment	LS	NS
ARANEAE (Spiders)							
Araneidae							
Argiope bruennichi	1	0	0	Nationally Scarce a	Great increase in distribution and frequency. Temperature critical. Requires downgrading.	Low	Low
ORTHOPTERA (Crickets and Grasshoppers)							
Tettigoniidae (Bush Crickets)							
Conocephalus fuscus	0	0	1	Nationally Scarce a	Temperature critical. Needs revision downwards.	Low	Low
Metrioptera roeselii	0	1	0	Nationally Scarce b	Temperature critical. Needs revision downwards.	Low	Low
HEMIPTERA-HETEROPTERA (Bugs)							
Miridae (Capsid Bugs)							
Lygus pratensis	1	0	0	RDB 3	Recent increase in records suggests this species should be downgraded.	Medium	Medium
HEMIPTERA-HOMOPTERA (Bugs)							
Cicadellidae (Leafhoppers)							
Aphrodes aestuarinus	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Aphrodes aestuarius	0	0	1	Nationally Scarce	Justified, habitat restricted.	High	High
Cixiidae (Planthoppers)							

Species	N	S	W	Status	Comment	LS	NS
Oliarus panzeri	0	0	1	Nationally Scarce	Justified, habitat restricted.	High	High
LEPIDOPTERA (Butterflies and Moths)							
Arctiidae (Tiger Moths)							
Tyria jacobaeae	1	1	0	UK BAP	Modern assessment. Very widespread with a very common foodplant (Common Ragwort). A different categorisation from most the other species.	Medium	Medium
Geometridae (Looper Moths)							
Scotopteryx bipunctaria	1	0	1	Nationally Scarce b	Justified, habitat restricted. Possibly also a migrant, which would down-grade it.	High-Medium	High-Medium
Scotopteryx chenopodiata	1	0	1	UK BAP	Modern assessment, declines in a widespread and common moth, cf *Tyria jacobae*.	Medium	Medium
Lasiocampidae							
Malacosoma neustria	1	0	0	UK BAP	Modern assessment, declines in a widespread and common moth, cf *Tyria jacobae*.	Medium	Medium
Sesiidae (Clearwing Moths)							
Bembecia ichneumoniformis	1	1	1	Nationally Scarce b	Greatly overlooked by moth recorders. An active, day-flying moth which we have found fairly frequently in suitable habitats. Needs downgrading.	Medium	Medium

Species	N	S	W	Status	Comment	LS	NS
COLEOPTERA (Beetles)							
Apionidae (Weevils)							
Catapion curtisii	1	0	0	Nationally Scarce a	Justified.	High	High
Oxystoma cerdo	0	1	0	Nationally Scarce b	Increasing, possibly downgrade?	Medium	Medium
Protapion filirostre	0	0	1	Nationally Scarce b	Justified.	High	High
Carabidae (Ground Beetles)							
Brachinus crepitans	1	0	0	Nationally Scarce b	? Justified.	High	High
Ophonus ardosiacus	1	0	0	Nationally Scarce b	Justified.	High	High
Cerambycidae (Long-horn Beetles)							
Phytoecia cylindrica	0	1	0	Nationally Scarce b	? Justified. Evidence of expansion.	Medium	Medium
Coccinellidae (Ladybird Beetles)							
Hippodamia variegata	0	1	1	Nationally Scarce b	Very widespread along Thames Corridor.	Listed as High (Essex Red List as *Adonia variegata*), but we suggest this should be Low as it has increased markedly[1].	Medium
Cryptophagidae (Fungus beetles)							
Atomaria scutellaris	0	0	1	RDB K	Justified.	High	High

1. Confirmed by the entry in The Ladybirds of Britain and Ireland.

Species	N	S	W	Status	Comment	LS	NS
Curculionidae (Weevils)							
Mecinus collaris	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Mecinus janthinus	0	1	0	Nationally Scarce a	Justified.	High	High
Phyllobius vespertinus	1	0	0	Nationally Scarce b	Justified, habitat restricted.	High	High
Pselactus spadix	0	0	1	Nationally Scarce b	?Justified, habitat restricted, but often frequent.	Medium	Medium
Rhinusa linariae	1	0	0	Nationally Scarce a	Justified.	High	High
Sibinia arenariae	0	1	0	Nationally Scarce b	Justified, habitat restricted.	High	High
Sitona cinerascens	1	0	0	RDB K	Justified.	High	High
Sitona macularius	1	1	0	Nationally Scarce b	Justified.	High	High
Sitona waterhousei	0	0	1	Nationally Scarce b	Justified.	High	High
Tychius schneideri	0	0	1	Nationally Scarce b	Justified, habitat restricted.	High	High
Tychius squamulatus	1	0	0	Nationally Scarce b	Justified.	High	High
Zacladus exiguus	0	1	0	Nationally Scarce b	Justified.	High	High
Drilidae							
Drilus flavescens	1	0	1	Nationally Scarce a	Justified.	High	High
Elateridae (Click Beetles)							
Athous campyloides	1	0	0	Nationally Scarce b	?Justified, apparently spreading.	Medium	Medium
Mordellidae (Tumbling Flower Beetles)							
Mordellistena acuticollis	1	0	1	RDB K	?Justified. Many new *Mordellistena* have been found recently in the UK.	Medium	Medium
Rhynchitidae (Weevils)							
Temnocerus tomentosus	1	0	0	Nationally Scarce b	Justified.	High	High

Species	N	S	W	Status	Comment	LS	NS
DIPTERA (Flies)							
Conopidae (Thick-headed Flies)							
Myopa strandi	0	0	1	RDB 3	Very ocasional, but this might be due in part at least to its very short adult life cycle.	High	High
Zodion cinereum	1	1	0	Nationally Scarce b	Very ocasional, but this might be due in part at least to its very short adult life cycle.	High	High
Stratiomyidae (Soldierflies)							
Stratiomys singularior	1	0	0	Nationally Scarce	Justified, habitat restricted.	High	High
Syrphidae (Hoverflies)							
Cheilosia cynocephala	1	0	0	Nationally Scarce	Justified, indeed may need uprating.	High	High
Pipizella maculipennis	0	0	1	RDB 3	Justified.	High	High
Pipizella virens	1	1	0	Nationally Scarce b	Justified.	High	High
Tachinidae (Parasite Flies)							
Cistogaster globosa	1	1	0	RDB 1	Probably needs downgrading, although much less frequent than in the 1990s	High	High
Gymnosoma nitens	0	1	0	RDB 1	Justified.	High	High
Tephritidae (Picture-wing Flies)							
Merzomyia westermanni	1	0	1	Nationally Scarce	? Perhaps needs downgrading.	Medium	Medium
Orellia falcata	0	1	0	Nationally Scarce	Justified.	High	High
Ulidiidae							

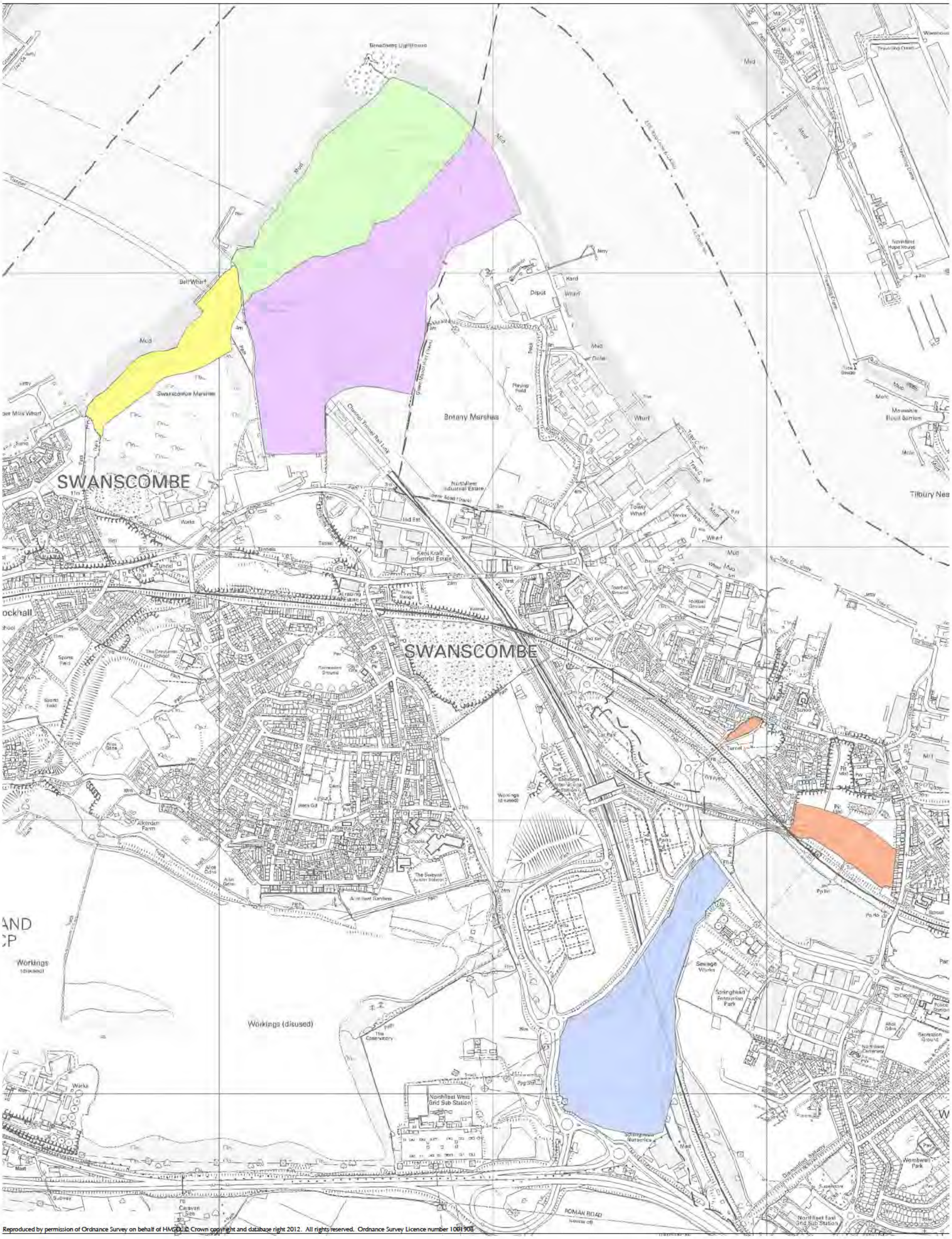
Species	N	S	W	Status	Comment	LS	NS
Dorycera graminum	1	0	0	RDB 3. UK BAP	Have found this species in most of the grassland sites we have surveyed along the Thames. Not found elsewhere.	Medium	High
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)							
Andrenidae (Mining Bees)							
Andrena alfkenella	1	0	0	RDB 3	Justified.	High	High
Andrena labiata	0	1	0	Nationally Scarce a	Become much more frequent over past ten years. Possibly requires downgrading.	High	Medium
Andrena minutuloides	1	1	1	Nationally Scarce a	Become much more frequent over past ten years. Possibly requires downgrading.	Medium	Medium
Andrena pilipes s.s	0	0	1	Nationally Scarce b	Justified.	High	High
Apidae (Bees)							
Bombus humilis	1	0	1	UK BAP	Modern assessment.	High. Part of largest area of potentially protected grassland habitat for this species in north of Thames corridor.	High. Restrict. range in UK. Major pop. in SE.
Ceratina cyanea	1	1	1	RDB 3	Increased distribution markedly in modern times.	Medium	Medium
Nomada flavopicta	0	0	1	Nationally Scarce b	Justified.	High	High

Species	N	S	W	Status	Comment	LS	NS
Nomada fucata	1	0	1	Nationally Scarce a	Needs revision downward. No threat.	Low	Low
Nomada fulvicornis	1	1	0	RDB 3	Justified.	High	High
Nomada hirtipes	1	0	0	RDB 3	Perhaps needs downgrading.	High	High
Colletidae (Bees)							
Colletes halophilus	1	1	1	Nationally Scarce a. UK BAP	Justified.	High	High
Colletes marginatus	0	0	1	Nationally Scarce a	Justified.	High	High
Hylaeus cornutus	1	0	0	Nationally Scarce a	Much more widespread now than previously. Needs downgrading.	Medium	Medium
Crabronidae (Solitary Wasps)							
Ectemnius dives	1	0	0	Nationally Scarce b	? Justified, perhaps needs downgrading.	Medium	Medium
Ectemnius sexcinctus	0	0	1	Nationally Scarce b	Justified.	High	High
Lestiphorus bicinctus	1	0	0	Nationally Scarce b	Justified.	High	High
Nysson trimaculatus	1	0	0	Nationally Scarce b	Perhaps needs downgrading.	Medium	Medium
Psenulus schencki	1	0	0	Nationally Scarce a	Justified.	High	High
Formicidae (Ants)							
Myrmica specioides	1	1	0	RDB 3	Inreceased distribution means this species needs downgrading.	Medium	Medium
Ponera coarctata	0	0	1	Nationally Scarce b	A cryptic species, but with few records - ? justified.	High	High
Halicitidae (Mining Bees)							
Lasioglossum malachurum	0	0	1	Nationally Scarce a	Needs revision downward. No threat.	Low	Low

Species	N	S	W	Status	Comment	LS	NS
Lasioglossum pauperatum	0	1	0	RDB 3	Justified.	Medium. Fairly frequent on unimprov. grassland sites in Thames Corridor.	High
Lasioglossum pauxillum	1	1	1	Nationally Scarce a	Needs revision downward. Currently spread northwards. Can be commonest species in wide variety of habitats in S. England. No threat.	Low	Low
Lasioglossum puncticolle	1	1	1	Nationally Scarce b	Justified.	Medium. Fairly frequent on unimprov. grassland sites in Thames Corridor.	High
Sphecodes crassus	0	1	0	Nationally Scarce b	Justified?	Medium	Medium but I.D. difficult
Sphecodes reticulatus	1	0	0	Nationally Scarce a	?Justified.	High	Medium
Sphecodes rubicundus	1	0	0	Nationally Scarce a	Justified.	High	High
Megachilidae (Leafcutter and Mason Bees)							
Megachile leachella	1	1	1	Nationally Scarce b	More widespread than orignally thought. Needs downgrading. Habitat restricted.	Medium	Medium
Melittidae (Bees)							
Melitta leporina	0	0	1	Nationally Scarce b	Justified.	High	High
Melitta tricincta	1	0	1	Nationally Scarce b	? Justified.	Medium	Medium

Species	N	S	W	Status	Comment	LS	NS
Pompilidae (Spider-hunting Wasps)							
Priocnemis cordivalvata	1	0	0	Nationally Scarce b	Justified, possibly needs revision upwards.	High	High
Vespidae (Social and Potter Wasps)							
Odynerus melanocephalus	1	0	1	Nationally Scarce a. UK BAP	Justified.	High	High

FIGURES



KEY

- Swanscombe West
- Swanscombe North
- Swansombe South
- Cement Works and Quarry
- Grassland East of Ebbsfleet Station

0 250 500 m

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N

FIGURE 1
Areas Referred to in the Report

MAY 2013

KEY

Swanscombe North

Swansombe South

0 75 150 m

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N

FIGURE 2
Swanscombe North and South Sampling Areas

KEY

Indicated in the descriptions above are the main areas of habitat sampled.
No sampling took place south of the ditch running parallel to, and south of the road.

0 50 100 m

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N

FIGURE 3
Swanscombe West
Sampling Areas

APPENDIX A
Total List of Species Recorded

Table A1 Total List of Species Recorded on Site
Key: N = Found in Swanscombe North
S = Found in Swanscombe South
W = Found in Swanscome West
Status = Current conservation status

Species	N	S	W	Status	Distribution	Notes
ARANEAE (Spiders)						
Agelenidae						
Agelena labyrinthica	0	0	1		Southern Widespread	Commonly found. Amongst rough grassland and heathland. It spins its funnel web near ground level amongst tall vegetation, heather and occasionally in gorse preying on mainly grasshoppers.
Argiope bruennichi	1	0	0	Nationally Scarce a	Southern Restricted	Frequently found, but very southern, Expanding range recently. The species preys particularly on Grasshoppers.
ODONATA (Damsel and Dragonflies)						
Aeshnidae (Hawker Dragonflies)						
Aeshna cyanea	1	0	0		Universal	Commonly found in the south, but scarcer towards the north. Breeds in still waters of various sizes, including garden ponds. Possibly associated with open woodland conditions.
Coenagrionidae (Damselflies)						
Enallagma cyathigerum	1	0	0		Universal	Common Blue Damselfly. Commonly found. Breeds in a variety of open waters.
Ischnura elegans	1	0	0		Universal	Blue-tailed Damselfly. Commonly found. A very adaptable species as a larva.
Libellulidae (Darter Dragonflies)						
Sympetrum striolatum	1	0	1		Universal	Common Darter Dragonfly. Abundantly found. Associated with a range of still and slowly-flowing water bodies.

Species	N	S	W	Status	Distribution	Notes
ORTHOPTERA (Crickets and Grasshoppers)						
Acrididae (Grasshoppers)						
Chorthippus albomarginatus	1	0	1		Southern Restricted	Lesser Marsh Grasshopper. Locally common in wet grasslands in southen and midland England. Tends to be coastal.
Chorthippus brunneus	1	1	1		Universal	Field Grasshopper. Commonly found. A ready coloniser of disturbed areas with a sparse vegetation.
Chorthippus parallelus	0	0	1		Universal	Meadow Grasshopper. Commonly found in a variety of grassy habitats.
Omocestus viridulus	1	0	0		Universal	Common Green Grasshopper. Commonly found. Long grass in moister situations.
Tetrigidae (Groundhoppers)						
Tetrix subulata	0	1	0		Southern Widespread	Slender Ground-hopper. Frequently found in wet places.
Tetrix undulata	0	0	1		Universal	Common Ground-hopper. Commonly found in damp places with areas of bare mud.
Tettigoniidae (Bush Crickets)						
Conocephalus fuscus	0	0	1	Nationally Scarce a	Southern Widespread	Long-winged Cone-head. Commonly found. Increasingly widespread throughout southern England.
Leptophyes punctatissima	1	0	0		Southern Widespread	Speckled Bush-cricket. Commonly found. Strongly biased towards southern England and Wales. Scrub.
Meconema thalassinum	0	0	1		Southern Widespread	Oak Bush-cricket. Commonly found. Wooded localities in the southern British Isles.
Metrioptera roeselii	0	1	0	Nationally Scarce b	Southern Restricted	Roesel's Bush-cricket. Commonly found in long grasslands and spreading rapidly in southern Britain.

Species	N	S	W	Status	Distribution	Notes
Tettigonia viridissima	0	0	1		Southern Restricted	Great Green Bush Cricket. Locally frequently found. Associated with scrubby grassland, but needs thin turf for oviposition.
DERMAPTERA (Earwigs)						
Forficulidae (Earwigs)						
Forficula auricularia	1	1	0		Universal	Common Earwig. Very commonly found.
MECOPTERA, MEGALOPTERA, NEUROPTERA (Lacewings and allies)						
Hemerobiidae (Brown Lacewings)						
Micromus angulatus	0	0	1		Southern Widespread	Local and infrequently found. In a variety of habitats.
HEMIPTERA-HETEROPTERA (Bugs)						
Berytinidae (Stiltbugs)						
Cymus melanocephalus	0	0	1		Southern Widespread	Commonly found on rushes, *Juncus*.
Coreidae (Squashbugs)						
Coreus marginatus	1	1	1		Southern Widespread	Commonly found. On *Rumex* and *Polygonum*.
Coriomeris denticulatus	1	1	0		Southern widespread	Frequently found. Feeds on legumes.
Lygaeidae (Groundbugs)						
Ischnodemus sabuleti	1	1	1		Southern Restricted	Commonly found. Usually in wetland habitats. Reedbeds.
Nysius senecionis	0	0	1		Southern Widespread	Locally frequently found, on ragwort and Common Fleabane. Recent colonist.
Peritrechus geniculatus	0	1	0		Southern Widespread	Commonly found, in dry grassland habitats.

Species	N	S	W	Status	Distribution	Notes
Taphropeltus contractus	1	0	0		Universal	Commonly found. sparsely-vegetated, dry soils amongst leaf litter.
Miridae (Capsid Bugs)						
Adelphocoris lineolatus	1	1	1		Universal	Commonly found. The larval food plants are all Fabaceae, although the adults may be on Asteraceae.
Closterotomus norwegicus	1	1	1		Universal	Commonly found on a variety of plants.
Deraeocoris lutescens	1	0	1		Southern Widespread	Commonly found. On a variety of tree foliage.
Europiella artemisiae	1	0	0		Southern Widespread	Commonly found. Associated with *Artemesia*.
Europiella artemisiae	1	0	0		Southern Widespread	Commonly found. Associated with *Artemesia*.
Heterotoma planicornis	1	0	0		Universal	Commonly found on a variety of plant species.
Leptopterna dolabrata	0	1	0		Universal	Commonly found. Associated with grasses.
Leptopterna ferrugata	0	0	1		Universal	Commonly found. Associated with grasses.
Liocoris tripustulatus	1	0	0		Universal	Commonly found, on Stinging Nettle *Urtica dioica*.
Lygus maritimus	1	0	0		Southern widespread	Frequently found. It occurs in a range of open habitats on a variety of host-plants including mayweed, fat hen and sorrel.
Lygus pratensis	1	0	0	RDB 3	Southern Restricted	Infrequently found, There has been much taxonomic confusion in the past and many old records are unreliable. Found in a variety of habitats including woodland rides and grassland. Biology and ecology are uncertain. Increasing recently.
Macrotylus horvathi	1	0	0		Southern Restricted	Infrequently found. Associated with *Ballota nigra*. Recently found in Britain, currently known from Kent only.
Macrotylus paykulli	0	1	0		Southern widespread	Commonly found, Rest Harrow.

Species	N	S	W	Status	Distribution	Notes
Notostira elongata	1	1	1		Southern Widespread	Commonly found, associated with grasses.
Orthocephalus saltator	0	0	1		Universal	Commonly found on a variety of herbaceous plants.
Orthops campestris	1	0	0		Universal	Commonly found, on several species of Apiaceae.
Orthops kalmii	1	0	0		Universal	Commonly found. On several species of Apiaceae, the eggs are laid in the flower-head.
Orthotylus flavosparsus	0	0	1		Universal	Frequently found. On Chenopodaceae, especially Fat Hen, goosefoots and oraches. Most frequent in coastal habitats.
Orthotylus moncreaffi	0	0	1		Southern Widespread	Coastal habitats, on Chenopodaceae, especially Sea Purslane.
Phytocoris varipes	1	0	1		Southern Widespread	Commonly found associated with grasses.
Plagiognathus chrysanthemi	1	0	1		Universal	Commonly found. On a variety of herbaceous plants.
Stenodema calcarata	0	0	1		Universal	Commonly found. Associated with grasses.
Trigonotylus ruficornis	0	0	1		Universal	Commonly found associated with grasses.
Nabidae (Damselbugs)						
Himacerus mirmicoides	0	1	0		Southern Widespread	Commonly found. In grassland habitats.
Nabis flavomarginatus	1	0	0		Universal	Commonly found. It lives amongst grasses, especially where they grow in damp areas or become tussocky. Widely distributed throughout the British Isles.
Pentatomidae (Sheildbugs)						
Aelia acuminata	1	1	1		Southern Restricted	Commonly found, associated with grasses.
Dolycoris baccarum	1	0	1		Universal	Commonly found. On a variety of herbaceous plants.

Species	N	S	W	Status	Distribution	Notes
Eurydema oleracea	1	0	0		Southern Restricted	Infrequently found. It feeds on the leaves of various crucifers, especially horse-radish and garlic mustard. Perhaps increased in recent years.
Eurydema oleracea	1	0	0		Southern Restricted	Infrequently found. It feeds on the leaves of various crucifers, especially horse-radish and garlic mustard. Perhaps increased in recent years.
Palomena prasina	1	0	0		Universal	Commonly found on a variety of herbaceous plants.
Picromerus bidens	1	0	0		Universal	Commonly found, on a variety of plants, often on heather.
Podops inuncta	0	1	0		Southern Widespread	Frequently found. in dry grassland habitats.
Sciocoris cursitans	1	0	0		Southern Restricted	Frequently found, but local. On dry sandy or chalky soils. Associated with low-growing plants such as Potentilla and Pilosella.
Scutelleridae (Shieldbugs)						
Eurygaster testudinaria	1	0	0		Southern Restricted	Frequently found. Local, associated with grasses.
Tingidae (Lacebugs)						
Acalypta parvula	0	1	0		Universal	Frequently found.
HEMIPTERA-HOMOPTERA (Bugs)						
Cercopidae (Froghoppers)						
Aphrophora alni	1	1	1		Universal	Commonly found, on a variety of trees and shrubs.
Neophilaenus campestris	1	1	1		Southern Widespread	Locally frequently found. Associated with calcareous grassland.
Philaenus spumarius	1	1	1		Universal	Commonly found. On a variety of trees and herbaceous plants.
Cicadellidae (Leafhoppers)						

Species	N	S	W	Status	Distribution	Notes
Aphrodes aestuarinus	0	0	1	Nationally Scarce b	Southern Restricted	Infrequently found. Saltmarshes between Dorset and Norfolk. Possibly associated with Shrubby Seablite *Suaeda maritima*.
Aphrodes aestuarius	0	0	1	Nationally Scarce	Southern Widespread	Infrequently found. A coastal species (Lancashire to Lincolnshire) with an association with Shrubby Seablite *Suaeda vera* and possibly Annual Seablite *Suaeda maritima*. Associations with Saltmarsh Grass *Pucinella maritima* and Sea Purslane *Atriplex portulacoides*.
Paramesus obtusifrons	1	0	0		Southern Widespread	Locally frequently found. Associated with coastal marshes. On *Bolboschoenus maritimus* and, possibly, *Phragmites communis*.
Cixiidae (Planthoppers)						
Cixius pilosus	1	0	0		Universal	Commonly found. Dry grassland.
Oliarus panzeri	0	0	1	Nationally Scarce	Southern Restricted	Locally Infrequently found. The ecology is poorly understood but it may prefer areas that are periodically waterlogged but which dry out and crack in summer. The foodplants are unknown but the nymphs are thought to be root feeders.
Delphacidae (Planthoppers)						
Asiraca clavicornis	1	0	1		Southern Restricted	Locally Frequently found. On grasses. Apparently much declined but still frequent in the London district.
Issidae (Planthoppers)						
Issus coleoptratus	1	0	1		Southern Widespread	Frequently Found. Associated with ivy *Hedera helix*.
Membracidae (Planthoppers)						
Centrotus cornutus	0	1	0		Universal	Frequently found, but local, feed on sap of oak.
LEPIDOPTERA (Butterflies and Moths)						

Species	N	S	W	Status	Distribution	Notes
Arctiidae (Tiger Moths)						
Phragmatobia fuliginosa	1	0	0		Universal	Ruby Tiger Moth. Commonly found. The hairy larvae feed on a variety of low plants.
Tyria jacobaeae	1	1	0	UK BAP	Universal	The Cinnabar moth. Commonly found. Larvae feed on Ragwort.
Geometridae (Looper Moths)						
Scotopteryx bipunctaria	1	0	1	Nationally Scarce b	Southern Restricted	The Chalk Carpet moth. Frequently found. The larva feeds on common bird's-foot trefoil, other trefolis, vetches and clovers. A species of calcareous sites, preferring those with rocks or bare ground.
Scotopteryx chenopodiata	1	0	1	UK BAP	Universal	Shaded Broad-bar moth. Frequently found. The larva feeds on species of vetch and clover.
Hesperiidae (Skipper Butterflies)						
Thymelicus lineola	0	0	1		Southern Restricted	Essex Skipper butterfly. Commonly found. The larva feeds on various grasses, particularly cock's-foot and creeping soft-grass. More or less restricted to southern and eastern England, but apparently spreading.
Thymelicus sylvestris	1	1	1		Southern Widespread	Small Skipper butterfly. Commonly found. The larva feeds on grasses, especially Holcus spp.
Lasiocampidae						
Malacosoma neustria	1	0	0	UK BAP	Universal	The Lackey Moth. Frequently found. The hairy larvae are initially gregarious and feed on many deciduous trees and shrubs.
Lycaenidae (Blue Butterflies)						
Celastrina argiolus	1	1	0		Southern Widespread	Holly Blue butterfly. Commonly found. There are two generations a year, larvae of the first feeding principally on the flowers of holly and of the second on buds of ivy.

Species	N	S	W	Status	Distribution	Notes
Polyommatus icarus	1	1	1		Universal	Common Blue butterfly. Commonly found. The larva feeds on various legumes, especially bird's-foot trefoil.
Noctuidae (Cut-worm Moths)						
Autographa gamma	1	0	0		Migrant	Silver Y moth. Migrant. Very commonly found. It flies readily by day and can be seen at dusk hovering over nectar sources.
Euclidia glyphica	0	0	1		Universal	Burnet Companion moth. Commonly found. The larvae feeds on trefoils and clovers.
Nymphalidae (Nymphalid, Fritillary and Brown Buterflies)						
Maniola jurtina	0	0	1		Universal	Meadow Brown butterfly. Commonly found. The larva feeds on many species of grass, preferring the finer varieties. It occurs in open grassy situations.
Pararge aegeria	1	0	0		Universal	Speckled Wood butterfly. Commonly found. Associated with shady woodlands, although it still requires patches of sunlight. The larva feeds on grasses, usually in sheltered situations such as woodland and scrub.
Polygonia c-album	0	1	0		Southern Widespread	Comma butterfly. Commonly found. The larva feeds on the leaves of nettle, elm and hop.
Pyronia tithonus	1	0	1		Southern Widespread	Gatekeeper butterfly. Commonly found. The larva feeds on various grasses, narrow-bladed species being preferred.
Pieridae (White Butterflies)						
Gonepteryx rhamni	0	1	0		Southern Widespread	Brimstone butterfly. Commonly found. The larva feeds on buckthorns.
Pieris brassicae	1	0	0		Universal	Large White butterfly. Commonly found. The larva feeds on various wild crucifers and legumes as well as cultivated cabbage.

Species	N	S	W	Status	Distribution	Notes
Pieris napi	0	1	0		Universal	Green-veined White. Commonly found. The larva feeds on wild crucifers, preferring those growing in damp and sheltered areas.
Pieris rapae	1	0	0		Universal	Small White butterfly. Commonly found. The larva feeds on a range of wild crucifers as well as cultivated ones.
Pyralidae						
Sitochroa palealis	1	1	0		Southern Restricted	Very locally frequently found. Larvae in a web in the seed heads of Daucus carota.
Sesiidae						
Bembecia ichneu-moniformis	1	1	1	Nationally Scarce b	Southern Widespread	6-Belted Clearwing. Locally frequently found, but easily missed. Flies fast in sunshine. Wasp mimic. Larva feeds at roots of *Lotus corniculatus* and *Anthyllis vulneraria*.
Zygaenidae (Burnett Moths)						
Zygaena filipendulae	0	0	1		Universal	6-spot Burnet moth. Commonly found. The larva feeds on bird's-foot trefoil but also needs long grass on which to make its cocoon.
COLEOPTERA (Beetles)						
Apionidae (Weevils)						
Aspidapion aeneum	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Aspidapion radiolus	1	1	0		Universal	Frequently found. On mallow *Malva* species.
Catapion curtisii	1	0	0	Nationally Scarce a	Southern Restricted	Very local, rarely found. There are recent (post-1970) records from only a few coastal sites in the Isle of Wight, South Hampshire, Phytophagous. The larvae develop in galls in the rootstocks of white clover *Trifolium repens* and strawberry clover *Trifolium fragiferum*. Adults have also been recorded from subterranean clover *Trifolium subterraneum* in the Isle of Wight.

Species	N	S	W	Status	Distribution	Notes
Eutrichapion ervi	1	0	1		Universal	Commonly found. On vetches, especially *Lathyrus pratensis*.
Eutrichapion viciae	1	0	0		Universal	Frequently found, on Yellow Vetchling *Lathyrus pratensis*.
Holotrichapion pisi	1	1	1		Universal	Commonly found. Associated with *Medicago* species, larvae develop in vegetative buds.
Ischnopterapion loti	1	1	1		Universal	Commonly found, on Bird's-foot Trefoil *Lotus corniculatus*.
Malvapion malvae	1	1	0		Southern Restricted	Frequently found. On mallow *Malva* species.
Oxystoma cerdo	0	1	0	Nationally Scarce b	Southern Widespread	Widespread but local, formerly confined to the midlands and northern Britain. Now recorded widely in south-east England, where it is possibly a recent colonist. Phytophagous. Associated with vetches, especially tufted vetch *Vicia cracca*. The larvae develop in the pods feeding on the seeds.
Oxystoma pomonae	1	0	1		Southern Restricted	Frequently found. On Yellow Vetchling *Lathyrus pratensis*.
Perapion violaceum	0	0	1		Universal	Commonly found, on dock *Rumex* species.
Protapion apricans	1	1	1		Universal	Commonly found, on Red Clover *Trifolium pratense*.
Protapion assimile	1	0	0		Universal	Commonly found. On *Trifolium* species.
Protapion filirostre	0	0	1	Nationally Scarce b	Southern Widespread	Locally frequently found. On *Trifolium campestre, T. dubium* & *T. aureum*. Larvae in flower heads.
Protapion trifolii	0	1	1		Southern Widespread	Commonly found. On clover *Trifolium pratense* & *T. medium*.
Pseudapion rufirostre	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Pseudapion rufirostre	1	1	0		Southern Widespread	Frequently found. On mallow *Malva* species.
Stenopterapion meliloti	1	1	1		Southern Restricted	Locally frequently found. Associated with *Melilotus*, larvae develop in the stems.
Stenopterapion tenue	1	0	1		Southern Widespread	Commonly found. On *Medicago* and probably *Melilotus* species.

Species	N	S	W	Status	Distribution	Notes
Bruchididae (Seed Weevils)						
Bruchidius imbricornis	1	0	0		Southern Restricted	Locally frequently found. A very recent discovery. Associated with Goat's Rue *Calega officinalis*. Larvae develop and pupate in the seeds.
Bruchidius varius	1	1	1		Southern Restricted	Commonly found, on clover *Trifolium pratense & T. medium*.
Bruchus brachialis	1	1	1		Southern Restricted	Locally commonly found, on Fodder Vetch *Vicia villosus*. Larvae develop in the seed pods.
Bruchus loti	1	1	1		Southern Restricted	Commonly found, on Bird's-foot Trefoil *Lotus corniculatus*.
Bruchus rufimanus	1	0	1		Southern Widespread	Commonly found. On Yellow Vetchling *Lathyrus pratensis*. also on stored legume crops.
Bruchus rufipes	1	1	1		Southern Restricted	Commonly found. On Fabaceae.
Byrrhidae						
Curimopsis maritima	1	0	0		Southern Widespread	Commonly found. Associated with sparsely-vegetated, dry soils, mostly coastal.
Cantharidae (Soldier Beetles)						
Cantharis cryptica	0	1	1		Universal	Commonly found. Associated with areas of lush vegetation.
Cantharis lateralis	1	0	1		Southern Widespread	Commonly found, associated with grassland habitats.
Cantharis nigra	1	0	0		Universal	Commonly found. In lowland marshes and meadows.
Cantharis rustica	1	0	0		Southern Widespread	Commonly found, in a variety of grassland habitats.
Malthinus flaveolus	0	0	1		Universal	Commonly found, on the foliage of trees and shrubs.
Malthinus seriepunctatus	0	0	1		Southern Widespread	Commonly found, in broadleaf woodland habitats.
Rhagonycha fulva	1	1	1		Universal	Commonly found. In a wide variety of habitats.
Carabidae (Ground Beetles)						

Species	N	S	W	Status	Distribution	Notes
Amara tibialis	1	0	0		Universal	Commonly found. Sandy soils.
Badister bullatus	0	1	0		Universal	Commonly found.
Bembidion lunulatum	1	0	0		Southern Widespread	Commonly found.
Bembidion minimum	0	0	1		Universal	Commonly found. On mud and in tidal debris in estuaries and saltmarshes.
Bembidion properans	1	1	1		Southern Widespread	Commonly found. Associated with open sunny places.
Brachinus crepitans	1	0	0	Nationally Scarce b	Southern Restricted	Frequently found but local. Associated with open stoney places, particularly on calcareous soils. It has been found in chalk and limestone quarries, the margins of arable fields, clay-pits, and in various coastal habitats including stabilised shingle beaches. Adults are gregarious and are found under stones or at plant roots. Adults are predatory and the larvae are probably parasitic on pupae of other beetles.
Brachinus crepitans	1	0	0	Nationally Scarce b	Southern Restricted	Frequently found but local. Associated with open stony places, particularly on calcareous soils. It has been found in chalk and limestone quarries, the margins of arable fields, clay-pits, and in various coastal habitats including stabilised shingle beaches. Adults are gregarious and are found under stones or at plant roots. Adults are predatory and the larvae are probably parasitic on pupae of other beetles.
Calathus fuscipes	1	0	0		Universal	Commonly found. Associated with open habitats.
Cicindela campestris	0	1	0		Universal	Green Tiger Beetle. Locally frequently found. Strongly associated with open habitats with sunny bare ground, including heaths or moors.
Curtonotus aulicus	1	0	0		Universal	Commonly found, adults feed on seeds of Asteraceae.

Species	N	S	W	Status	Distribution	Notes
Curtonotus aulicus	1	0	0		Universal	Commonly found, adults feed on seeds of Asteraceae.
Curtonotus convexiusculus	0	0	1		Universal	Frequently found, coastal, but also found in dry open situations well inland.
Dicheirotrichus gustavi	0	0	1		Universal	Commonly found. A saltmarsh species living around the high tide mark.
Harpalus affinis	1	0	0		Universal	Commonly found.
Microlestes maurus	1	0	0		Southern Restricted	Commonly found. Associated with leaf litter on dry soils.
Notiophilus biguttatus	1	0	0		Universal	Very commonly found. In many different habitats, including gardens.
Ophonus ardosiacus	1	0	0	Nationally Scarce b	Southern Restricted	Found mainly on chalk but occasionally on clay soils, in cultivated land, undercliffs, cliff-tops, sea walls and upper levels of beaches. Phytophagous, feeding mainly on seeds.
Paradromius linearis	1	1	1		Universal	Commonly found, in grassland habitats.
Pterostichus madidus	1	0	0		Universal	Commonly found, in a wide variety of habitats.
Syntomus foveatus	1	1	1		Universal	Commonly found, on open dry soils, including arable land.
Cerambycidae (Long-horn Beetles)						
Grammoptera ruficornis	0	0	1		Southern Widespread	Commonly found in woodland habitats. Larvae develop in small twigs.
Phytoecia cylindrica	0	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. The larvae live in umbelifer stems in open grasslands.
Pseudovadonia livida	0	1	0		Southern Restricted	Commonly found. In dry grassland.
Stenurella melanura	0	1	1		Southern Widespread	Locally commonly found, adults visit flowers, breeds in dead wood.
Chrysomelidae (Leaf Beetles)						
Aphthona euphorbiae	0	0	1		Southern Widespread	Commonly found, often on ivy, a pest of flax *Linum* species.

Species	N	S	W	Status	Distribution	Notes
Cassida rubiginosa	0	0	1		Universal	Commonly found, on thistles.
Chrysolina americana	1	0	0		Southern Restricted	A recent arrival from the Mediterranean region with a distribution centred around London although there are several records from elsewhere. Associated with Lavender and Rosemary.
Chrysolina hyperici	1	0	0		Southern Widespread	Commonly found,on St John's-wort *Hypericum* species.
Crepidodera aurata	1	0	0		Universal	Commonly found, on willows *Salix* species.
Cryptocephalus aureolus	1	0	1		Universal	Frequently found. Adults are usually seen in the flowers of yellow Asteraceae growing in short turf. It is not known what the larvae do.
Cryptocephalus fulvus	1	1	1		Southern Widespread	Locally commonly found, in dry grassland.
Cryptocephalus hypochaeridis	1	1	1		Southern Widespread	Frequently found on calcareous grasslands. Adults usually seen in flowers, especially those of Asteracea. Details of life-history not known.
Cryptocephalus labiatus	1	0	0		Universal	Commonly found, on foliage of broadleaf trees.
Cryptocephalus moraei	1	0	0		Southern Widespread	Frequently found. The adults and larvae feed on St. John's-wort growing in short vegetation.
Longitarsus melanocephalus	0	0	1		Universal	Common, on Ribwort Plantain *Plantago lanceolata*.
Longitarsus pratensis	1	1	0		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Longitarsus succineus	1	0	0		Universal	Commonly found. Both adults and larvae feed on the foliage of various Asteraceae.
Neocrepidodera transversa	0	1	0		Universal	Commonly found. On thistles.
Phyllotreta nigripes	1	0	1		Universal	Commonly found, on Brassicaceae.
Coccinellidae (Ladybird Beetles)						

Species	N	S	W	Status	Distribution	Notes
Adalia decempunctata	1	0	1		Universal	Commonly found, on foliage of broadleaf trees.
Halyzia sedecimguttata	0	0	1		Southern Widespread	Commonly found, on tree foliage, often on Sycamore.
Harmonia axyridis	1	1	1		Southern Widespread	Harlequin Ladybird. Commonly found. A fairly large ladybird occurring in a wide range of colour patterns. It occurs on various herbaceous plants and trees, the larvae being predatory on aphids and other insects. A recent addition to the British fauna, spreading rapidly.
Hippodamia variegata	0	1	1	Nationally Scarce b	Southern Widespread	Frequently found but local in southern England and Wales. Associated with a variety of habitats especially dry grassland on sandy soils. The larvae and adults are predatory upon aphids.
Nephus redtenbacheri	0	0	1		Universal	Frequently found, but local, in sparsely vegetated grassland. Feeds on scale insects.
Propylea quattuordecim-punctata	1	1	1		Universal	Commonly found. In a wide variety of habitats.
Psyllobora vigintiduo-punctata	1	1	1		Southern Widespread	Commonly found. In grassland habitats.
Rhyzobius litura	1	1	1		Universal	Commonly found, in grassland habitats. Feeds on scale insects.
Subcoccinella vigintiquattuor-punctata	1	1	0		Universal	Commonly found, in dry grassland.
Tytthaspis sedecimpunctata	0	1	1		Universal	16-spot ladybird. Commonly found, in wet grassland.
Cryptophagidae (Fungus beetles)						
Antherophagus pallens	1	0	0		Universal	Commonly found. In the nests of Bumblebees.

Species	N	S	W	Status	Distribution	Notes
Atomaria scutellaris	0	0	1	RDB K	Southern Restricted	Infrequently found. For many years this tiny beetle was known in Britain only from the Isles of Scilly. However, it has recently become established in south-east England. It has been found in a variety of habitats but is perhaps most frequent near the coast.
Ephistemus globulus	0	1	0		Universal	Commonly found. In decaying vegetation.
Curculionidae (Weevils)						
Anthonomus pedicularius	0	1	0		Universal	Commonly found. On hawthorn *Crataegus* species.
Barypeithes pellucidus	1	0	0		Southern Restricted	Commonly found on low growing plants.
Ceutorhynchus contractus	1	0	0		Universal	Commonly found. In a variety of grassland and ruderal habitats. Polyphagous on a wide variety of Brassicaceae.
Ceutorhynchus obstrictus	1	1	1		Universal	Commonly found. Feeds on Brassicaceae.
Ceutorhynchus pallidactylus	1	0	0		Universal	Commonly found, on Brassicaceae.
Ceutorhynchus turbatus	1	1	1		Southern Widespread	Frequently found. Mainly southern England and East Anglia, recently in North Wales, probably spreading, as is the host plant. On open, often disturbed ground, associated with Hoary Cress *Lepidium draba*, larvae develop in the fruits, pupates in the soil. First found in Britain in 1951.
Ceutorhynchus typhae	1	0	0		Universal	Commonly found, on Brassicaceae.
Curculio glandium	0	0	1		Southern Restricted	Commonly found, on oak.
Dorytomus taeniatus	1	0	0		Universal	Commonly found, on willows *Salix* species.
Euophryum confine	0	1	0		Southern Widespread	Commonly found. Breeds in dead wood, a native of New Zealand.
Hypera nigrirostris	1	0	0		Universal	Commonly found, on clover, especially *Trifolium pratense*.

Species	N	S	W	Status	Distribution	Notes
Hypera plantaginis	1	0	0		Universal	Commonly found. On various species of Fabaceae.
Hypera postica	1	1	1		Southern Widespread	Commonly found. Feeds on Fabaceae.
Lixus scabricollis	1	0	0		Southern Restricted	Commonly found. Coastal, recent colonist. Sea Beet.
Mecinus collaris	0	0	1	Nationally Scarce b	Universal	Locally frequently found. In saltmarshes. Phytophagous. Associated with Sea Plantain *Plantago maritima*. The larvae develop in galls in the flowering stem, just below the inflorescence. Populations are frequently affected by parasitism.
Mecinus janthinus	0	1	0	Nationally Scarce a	Southern Restricted	First discovered in Britain in 1948, this small bluish weevil has been recorded since 1970 from East Kent, West Kent and South Essex, with older records for Surrey and Middlesex. Found on disturbed ground, grassland and road verges, often on chalky soils. Phytophagous. Associated with Common Toadflax *Linaria vulgaris*.
Mecinus labilis	0	1	0		Southern Widespread	Locally frequently found. On Plantains.
Mecinus pascuorum	1	1	1		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Mecinus pyraster	1	1	0		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Otiorhynchus ovatus	1	1	0		Universal	Frequently found. On sandy soils
Otiorhynchus rugosostriatus	1	0	0		Universal	Frequently found. Local in England and Wales, uncommon in Scotland. Parthenogenetic and polyphagous, a minor pest of soft fruit.
Phyllobius pyri	0	0	1		Universal	Commonly found, on a variety of tree species.
Phyllobius roboretanus	1	0	1		Southern Widespread	Commonly found, in grassland habitats.

Species	N	S	W	Status	Distribution	Notes
Phyllobius vespertinus	1	0	0	Nationally Scarce b	Southern Widespread	Locally frequently found. Coastal. Found amongst herbaceous vegetation in saltmarshes and other coastal habitats. Phytophagous and probably polyphagous, but an association with *Artemisia maritima* has been suggested.
Phyllobius virideaeris	1	1	1		Universal	Commonly found. In Grassland habitats.
Polydrusus pulchellus	1	0	0		Universal	Frequently found. Confined to saltmarsh habitats where it has been associated with *Artemisia maritime* and Chenopodaceae but it is thought to be polyphagous.
Pselactus spadix	0	0	1	Nationally Scarce b	Southern Widespread	Commonly found. Coastal. Phytophagous. A wood-boring species which forms colonies in driftwood and old wooden sea defences.
Rhinusa antirrhini	1	1	1		Southern Widespread	Commonly found. Usually found inside the flowers of *Linaria vulgaris*, it is possible that the larvae develop in the flowers.
Rhinusa linariae	1	0	0	Nationally Scarce a	Southern Restricted	Infrequently found and localised. Phytophagous, the larvae develop in root galls on Common Toadflax *Linaria vulgaris*.
Sibinia arenariae	0	1	0	Nationally scarce b	Southern widespread	Locally frequently found along the coasts of southern England and parts of Wales. Phytophagous. It is associated with rock spurry *Spergularia rupestris*, sea spurry *Spergularia marina* and sand spurry *Spergularia rubra*.

Species	N	S	W	Status	Distribution	Notes
Sitona cinerascens	1	0	0	RDB K	Southern Restricted	Infrequently found and very local. According to Hyman & Parsons (1992) this weevil is known as British from a single specimen without data in the Stephens collection in the Natural History Museum (London), however, a population was recently discovered on Canvey Island, South Essex and a single example was swept at Cuckmere Haven in 2005. Phytophagous. The host plant is apparently Slender Bird's-foot Trefoil *Lotus tenuis* and possibly other *Lotus* species but the life history remains unknown. Not listed in the Insect Red Data Book (Shirt, 1987).
Sitona cylindricollis	1	1	0		Southern Widespread	Locally frequently found. Associated with *Melilotus*.
Sitona hispidulus	1	0	1		Universal	Commonly found, on *Trifolium* species.
Sitona humeralis	1	1	1		Universal	Frequently found. *Medicago*.
Sitona lepidus	0	1	1		Universal	Commonly found, on various species of Fabaceae.
Sitona lineatus	1	1	1		Universal	Commonly found. On various species of Fabaceae.
Sitona macularius	1	1	0	Nationally Scarce b	Universal	Infrequently found and very local. Occurs in grassland habitats, particularly on chalky soils. Phytophagous, associated with a variety of leguminous plants including Sainfoin *Onobrychis viciifolia*, Wild Liquorice *Astragalus glycyphyllos*, Bird's-foot Trefoil *Lotus corniculatus*, tare, *Vicia* and medick *Medicago*. The larvae feed on the roots and root nodules.
Sitona puncticollis	0	0	1		Universal	Locally frequently found. Associated with Clovers.
Sitona regensteinensis	0	1	0		Universal	Commonly found, on *Cytisus scoparius, Ulex* and *Genista*.
Sitona sulcifrons	1	1	1		Universal	Locally comonly found. Feeds on Trifolium species.
Sitona waterhousei	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found, Local, *Lotus* Coastal landslips, sandy grassland.

Species	N	S	W	Status	Distribution	Notes
Trachyphloeus angustisetulus	1	0	1		Universal	Locally infrequently found. Associated with bare and re-vegetating ground.
Trichosirocalus troglodytes	1	1	1		Universal	Commonly found, on Ribwort Plantain *Plantago lanceolata*.
Tychius breviusculus	1	0	1		Southern Restricted	Infrequently found and very local. A recent discovery in Britain, currently known from ruderal sites close to the River Thames between London and Canvey Island where it is well established in several places. Also recorded from one site on the Dorset coast. Associated with *Melilotus* species, possibly preferring White Melilot *M. alba*.
Tychius junceus	1	1	0		Universal	Infrequently found and local In open grassland habitats on light soils. Associated with medicks, e.g., Black Medick *Medicago lupulina*.
Tychius meliloti	0	1	0		Southern Widespread	Infrequently found and localised. On melilot *Melilotus* species.
Tychius picirostris	0	0	1		Universal	Commonly found, on *Trifolium* species.
Tychius schneideri	0	0	1	Nationally Scarce b	Southern Restricted	Frequently found, but local. Phytophagous. It is found on calcareous grassland, cliff-tops and shingle beach habitats where its foodplant Kidney Vetch *Anthyllis vulneraria* grows.
Tychius squamulatus	1	0	0	Nationally Scarce b	Southern Restricted	Infrequently found. In grassland habitats on sandy soils, possibly preferring calcareous conditions. Phytophagous, associated with Bird's-foot Trefoil *Lotus corniculatus*. The larvae develop in the seed pods.
Tychius stephensi	1	1	0		Southern Restricted	Locally frequently found. In dry grasslands, associated with *Trifolium* species.
Zacladus exiguus	0	1	0	Nationally Scarce b	Southern Widespread	Locally infrequently found. Associated with the smaller-flowered Cranesbills, especially Cut Leaved and Hedgerow Cranesbill *Geranium dissectum* and *G. pyrenaicum*.
Drilidae						

Species	N	S	W	Status	Distribution	Notes
Drilus flavescens	1	0	1	Nationally Scarce a	Southern Restricted	Infrequently found and local. Recent records for only the Isle of Wight, Hampshire, Surrey, Kent and Sussex. Seldom found away from chalk grassland, the larvae feed on snails. The female is flightless.
Elateridae (Click Beetles)						
Agriotes sputator	1	1	1		Southern Widespread	Commonly found, in grassland habitats.
Agrypnus murinus	1	0	0		Southern Widespread	Commonly found in dry grassland.
Athous campyloides	1	0	0	Nationally Scarce b	Southern Restricted	Most records for this local click beetle are for South-east England. Adults are active at dusk for a short period in June and July. The wireworm larvae feed on plant roots. The species appears to be spreading in Britain.
Geotrupidae (Dung Beetles)						
Typhaeus typhoeus	1	1	0		Southern Widespread	Locally frequently found, in dung (mainly rabbit) on sandy soils.
Kateretidae						
Brachypterolus linariae	1	1	0		Southern Widespread	Commonly found. Breeds in the flowers of *Linaria* species.
Brachypterolus pulicarius	1	1	1		Universal	Frequently found. Associated with the flowers and seeds of Toadflax, *Linum* spp.
Lathridiidae						
Cartodere bifasciata	0	1	0		Universal	Very commonly found. Associated with decaying vegetable material.
Corticarina fuscula	0	0	1		Universal	Commonly found, in a variety of habitats.
Cortinicara gibbosa	0	1	0		Universal	Commonly found, in a variety of habitats.
Melyridae						
Anthocomus rufus	0	1	1		Southern Restricted	Commonly found. Reedbeds.
Axinotarsus marginalis	0	1	0		Southern Restricted	Commonly found. In grassland and woodland edge habitats.

Species	N	S	W	Status	Distribution	Notes
Cordylepherus viridis	1	1	1		Southern Restricted	Frequently found, in dry grassland.
Dasytes	0	1	1		Southern Restricted	Commonly found on flowers in hedges.
Malachius bipustulatus	1	1	0		Southern Widespread	Commonly found, on flowers in grassland and woodland.
Mordellidae (Tumbling Flower Beetles)						
Mordellistena acuticollis	1	0	1	RDB K	Southern Restricted	Infrequently found. Probably a recent colonist in Britain, this species was first recorded from Eriswell Lode near Mildenhall, West Suffolk and Shooter's Hill, West Kent in 1983 and 1984 respectively. It has recently been recorded from most counties in south-east England and East Anglia. Phytophagous. Associated with Mugwort *Artemisia vulgaris*, the larvae probably develop in the stems.
Mordellistena variegata	0	1	0		Southern Restricted	Locally frequently found. Adults found on flowers of hogweed and other species of umbels. Larval host uncertain but probably develop in plant stems.
Mordellochroa abdominalis	0	0	1		Southern Widespread	Frequently found, but local. Adults occur on flowers and larvae probably develop in dead wood or plant stems.
Nitidulidae (Pollen Beetles)						
Meligethes aeneus	1	1	1		Universal	Commonly found. Breeds in flowers of Brassicaceae.
Meligethes carinulatus	1	0	0		Southern Widespread	Frequently found on Bird's-foot Trefoil *Lotus corniculatus*.
Meligethes ruficornis	1	1	0		Southern Widespread	Infrequently found and localised. Breeds in flowers of *Ballota nigra*.
Oedemeridae						
Oedemera lurida	1	1	1		Southern Widespread	Commonly found. On a variety of flowers.

Species	N	S	W	Status	Distribution	Notes
Oedemera nobilis	0	1	0		Southern Widespread	Commonly found. On a variety of flowers.
Rhynchitidae (Weevils)						
Tatianaerhynchites aequatus	1	0	1		Universal	Commonly found. Feeds on hawthorn.
Temnocerus tomentosus	1	0	0	Nationally Scarce b	Southern Widespread	It occurs on various species of sallow and poplar, the larvae developing in the leaf buds. Local but widely distributed in England and Wales.
Scirtidae						
Cyphon laevipennis	0	0	1		Universal	Commonly found. Associated with *Phragmites* beds.
Scraptiidae						
Anaspis pulicaria	1	1	1		Southern Widespread	Commonly found, on a variety of flowers.
Staphylinidae (Rove Beetles)						
Astenus lyonessius	0	0	1		Southern Widespread	Commonly found. Amongst leaf litter in open-structured grassland.
Brachygluta helferi	0	0	1		Southern Widespread	Frequently found, amongst litter in saltmarshes. Assumed to be a predator.
Cypha longicornis	1	0	0		Universal	Commonly found, amongst litter on the ground.
Drusilla canaliculata	1	0	0		Southern Widespread	Commonly found, in dry grassland habitats.
Megalinus glabratus	1	0	0		Universal	Commonly found.
Metopsia clypeata	0	1	1		Universal	Commonly found. In moss and ground litter. Life history unknown.
Sepedophilus nigripennis	0	1	0		Universal	Commonly found, amongst litter on the ground.
Stenus aceris	1	0	0		Southern Widespread	Commonly found, but scarer in the north. At roots of grass and in moss in both grassland and woodland habitats, chiefly in lowland situations.
Stenus fulvicornis	1	0	0		Universal	Commonly found, in wetland habitats.

Species	N	S	W	Status	Distribution	Notes
Tachyporus atriceps	0	0	1		Universal	Commonly found. In grasslands amongst leaf litter and mosses.
Tachyporus hypnorum	1	1	0		Universal	Commonly found, amongst litter on the ground.
Tenebrionidae (Darkling Beetles)						
Isomira murina	1	1	1		Southern Widespread	Commonly found. In dry grassland.
Lagria hirta	1	0	0		Universal	Commonly found. Associated with hedgerows and scrub.
Nacerdes melanura	0	1	1		Universal	Commonly found. The Wharf-borer. Coastal. Breeds in old timber and driftwood along the shoreline.
DIPTERA (Flies)						
Asilidae (Robberflies)						
Dioctria atricapilla	0	1	0		Southern Widespread	Commonly found. Dry, grassy areas and heaths.
Dioctria baumhaueri	1	0	0		Southern Widespread	Commonly found. Dry, grassy areas and heaths at the edge of woodland.
Dioctria rufipes	1	1	1		Universal	Frequently found. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.
Dysmachus trigonus	0	1	0		Universal.	Locally commonly found. On heaths and dry, sandy grasslands in southern England. Coastal sand-dunes further north.
Leptogaster cylindrica	1	1	1		Southern Widespread.	Frequently found in long grass. The adult is an active predator of flying insects, the larvae are soil-dwelling predators.
Machimus atricapillus	1	0	0		Southern Widespread	Commonly found. Dry grasslands and scrub.
Machimus cingulatus	0	0	1		Southern Widespread	Commonly found south of London, infrequent elsewhere. Dry grasslands, heaths and scrub.
Bibionidae (St Mark's Flies)						
Bibio johannis	1	1	1		Universal	Very commonly found. The larvae feed in grassland.
Dilophus febrilis	0	0	1		Universal	Very commonly found. The larvae feed in grassland.

Species	N	S	W	Status	Distribution	Notes
Bombylius major	1	1	0		Southern Widespread	Commonly found. A cleptoparasite of a variety of springtime ground-nesting solitary bees.
Chloropidae						
Lipara lucens	0	1	0		Southern Widespread	Commonly found. The larvae gall the flowering stem of Common Reed, making a cigar-gall.
Conopidae (Thick-headed Flies)						
Conops quadrifasciatus	1	0	0		Universal	Commonly found. A parasite of bumble bee workers.
Myopa strandi	0	0	1	RDB 3	Southern Restricted	Rarely found. The larvae are internal parasites of solitary bees of the genus *Andrena*.
Sicus ferrugineus	1	1	0		Universal	Commonly found. A parasite of bumble bee workers.
Zodion cinereum	1	1	0	Nationally Scarce b	Southern Widespread	Rarely found. A parasitoid of adult bees.
Dolichopodidae						
Machaerium maritimae	1	0	0		Universal	Commonly found. Saltmarshes.
Scellus notatus	1	1	0		Universal	Frequently found. Local, in woodland and scrub.
Empididae (Dance Flies)						
Empis tessellata	1	0	0		Universal	Commonly found. Both adults and larvae are predatory.
Limoniidae (Craneflies)						
Limonia nubeculosa	1	0	0		Universal	Commonly found. Damp woodlands. The larvae feed in dead wood.
Symplecta stictica	1	0	1		Universal	Commonly found, especially associated with marshy coasts.
Platystomatidae						
Platystoma seminationis	1	0	0		Universal	Commonly found. The larvae develop in decaying vegetable matter in damp places.
Sciomyzidae (Snail-killing Flies)						

Species	N	S	W	Status	Distribution	Notes
Coremacera marginata	1	1	1		Universal	Frequently found. Associated with dry habitats. The larvae prey on terrestrial snails.
Limnia unguicornis	1	1	1		Universal	Commonly found in both wet and dry grassland.
Pherbellia cinerella	1	0	1		Universal	Commonly found in grassland.
Pherbina coryleti	1	0	1		Universal	Frequently found. Associated with a variety of wet habitats. The larvae prey on both aquatic and terrestrial snails.
Trypetoptera punctulata	0	1	0		Universal	Frequently found in a wide range of habitats. Biology unknown.
Stratiomyidae (Soldierflies)						
Beris vallata	0	0	1		Universal	Commonly found in a variety of habitats.
Chloromyia formosa	1	1	1		Universal	Commonly found. Breeds in rotting vegetation.
Chorisops tibialis	1	1	0		Southern Widespread	Frequently found in woodland rides and scrub-edge.
Microchrysa flavicornis	1	0	0		Universal	Commonly found. Breeds in rotting vegetation.
Nemotelus notatus	1	1	1		Universal	Frequently found. A species of coastal wetlands.
Stratiomys singularior	1	0	0	Nationally Scarce	Southern Widespread	Locally frequently found. Associated with brackish ditches, hence usually coastal.
Syrphidae (Hoverflies)						
Cheilosia cynocephala	1	0	0	Nationally Scarce	Southern Widesrpread	Infrequently found. Associated with thistles in alkaline grasslands. Has been reared from *Carduus nutans*.
Cheilosia impressa	1	0	0		Universal	Frequently found. Damp woodlands.
Cheilosia proxima	1	0	0		Universal	Commonly found. The larvae mine roots of *Cirsium* spp. Unrecorded from Ireland.
Cheilosia vernalis	1	0	0		Universal	Commonly found. The larvae mine the roots of a number of perennial plants.

Species	N	S	W	Status	Distribution	Notes
Chrysotoxum bicinctum	1	1	0		Universal	Frequently found. Dry grasslands and heaths, often near scrub. Probably feeds on aphids on roots. There may also be an association with ants.
Chrysotoxum festivum	1	0	1		Southern Widespread	Infrequently found. Grasslands at the margins of woodland or scrub, particularly in southern England.
Eristalinus aeneus	1	1	1		Universal	Abundance: Commonly found very close to shore-line. Breeds in rotting vegetable matter, particularly seaweed.
Eristalinus sepulchralis	1	0	0		Universal	Commonly found. Organically rich pools, especially on coastal grazing marshes. The larvae are semi-aquatic, occurring in rotting vegetation and in water enriched with animal dung.
Eristalis arbustorum	1	1	1		Universal	Very commonly found. The larvae live in organically rich wet mud.
Eristalis horticola	1	0	0		Universal	Commonly found. Local towards the north of the U.K.. The larvae live in organically rich wet mud.
Eristalis intricarius	1	0	0		Universal	Commonly found. Often in woodland clearings.
Eristalis pertinax	1	0	0		Universal	Very commonly found. The larvae live in organically rich wet mud.
Eupeodes corollae	1	0	0		Universal	Very commonly found everywhere. The larvae feed on aphids. A migratory species.
Eupeodes luniger	1	0	1		Universal	Commonly found. The larvae prey on aphids on conifers.
Helophilus pendulus	1	0	0		Universal	Very commonly found. The larvae live in organically rich wet mud.
Helophilus trivittatus	1	0	1		Universal	Infrequently found. Most often associated with grazing marshes and coastal meadows. Increased in distribution and found over many more habitat types recently.
Melanostoma mellinum	1	0	1		Universal	Very commonly found. A grassland species.
Melanostoma scalare	0	0	1		Universal	Very commonly found. A grassland species.
Myathropa florea	1	0	1		Universal	Commonly found. The larvae live in wet, decaying leaves.

Species	N	S	W	Status	Distribution	Notes
Paragus haemorrhous	0	1	0		Universal	Commonly found. Associated with patches of bare ground in short grassland.
Pipizella maculipennis	0	0	1	RDB 3	Southern Widespread	Rarely found. A species of dry grassland and woodland. The larvae feed on aphids on roots.
Pipizella viduata	1	1	1		Universal	Commonly found. A species of dry grassland. The larvae feed on aphids on umbellifer roots.
Pipizella virens	1	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. Possible association with aphids on roots of umbellifers.
Sphaerophoria rueppellii	1	0	1		Universal	Locally commonly found in the south-east. Uncommonly found elsewhere. Usually In dry grassland, although it has been also found along the edges of saltmarsh.
Sphaerophoria scripta	1	1	1		Universal	Very commonly found in the southern half of the British Isles. A grassland species, the larvae feed on aphids and Homoptera living in the ground layer.
Sphaerophoria taeniata	1	0	0		Universal	Frequently found. Associated with wet meadows.
Syritta pipiens	1	1	0		Universal	Very commonly found in most places throughout Britain. The larvae live in decaying vegetation.
Syrphus ribesii	1	0	0		Universal	Very commonly found. A migratory species. The larvae feed on aphids.
Tropidia scita	1	1	0		Universal	Locally common. A species of lush fen and marsh.
Xanthogramma pedissequum	0	1	0		Southern Widespread	Frequently found on dry grasslands. There is an association with *Lasius* ant nests.
Xylota segnis	1	0	0		Universal	Commonly found. Woodlands and hedgerows. A dead-wood breeding species which will even use sawdust.
Tabanidae (Horseflies)						
Chrysops relictus	1	1	1		Universal	Frequently found. Associated with wet woodlands. Commoner in Scotland than *C. caecutiens*.

Species	N	S	W	Status	Distribution	Notes
Cistogaster globosa	1	1	0	RDB 1	Southern Restricted	Locally frequent, becoming more so. Dry grassland with bare ground. Parasitic on Bishops Mitre Bug.
Gymnosoma nitens	0	1	0	RDB 1	Southern Restricted	Infrequently found, and very local. In common with many other tachind flies associated with Hemiptera this species has become more widespread in the recent component of the fauna of Thames corridor gravel terrace sites. Parasitises *Sciocoris curtisans* and possibly other shield-bugs.
Tephritidae (Picture-wing Flies)						
Campiglossa misella	1	0	0		Southern Restricted	Locally frequently found. Larvae attack the flower spike of *Artemisia vulgaris*, inducing a stem gall in the first generation and developing in the capitula in the second generation.
Campiglossa plantaginis	1	0	0		Southern Widespread	Found locally in southern Britain. Mainly found in coastal districts, especially saltmarshes. Associated with *Artemisia maritimia* and *A. vulgaris*. Larvae attack the capitula of the host plants. Has als obeen found in the Brecks, where it was associated with Ragwort.
Chaetorellia jaceae	1	0	0		Southern Restricted	Frequently found. The larvae develop in the seed heads of Asteraceae.
Merzomyia westermanni	1	0	1	Nationally scarce	Southern Restricted	Frequently found. Local in south-east England but perhaps more frequent than originally thought. The larvae develop in the flower-heads of ragwort *Senecio* species.
Orellia falcata	0	1	0	Nationally Scarce	Southern Restricted	Infrequently found. The larvae develop in the roots of Goat's Beard, *Tragopogon pratensis*.
Tephritis divisa	1	0	0		Southern Restricted	Commonly found. Recent arrival from southern Europe. Associated with *Picris echioides*.
Urophora cardui	0	1	0		Southern Restricted	Commonly found, on Creeping Thistles *Cirsium vulgare*.

Species	N	S	W	Status	Distribution	Notes
Urophora quadrifasciata	1	0	0		Southern Restricted	Commonly found on Hardheads *Centaurea nigra*.
Therevidae (Stiletto Flies)						
Thereva nobilitata	0	1	0		Universal	Commonly found. The commonest Therevid fly, often associated with dry grasslands. The larva lives in loose soil.
Tipulidae (Craneflies)						
Nephrotoma appendiculata	0	0	1		Universal	Commonly found. A species of dry grassland.
Nephrotoma flavescens	1	1	0		Universal	Commonly found. A species of dry grasslands.
Tipula oleracea	1	0	1		Universal	Commonly found. Associated with pastures on wet soils.
Ulidiidae						
Dorycera graminum	1	0	0	RDB 3. UK BAP	Southern Restricted	Frequently found. Associated with taller grasslands, often dry ones. However, the larval food plant is unknown; it may be the roots or inflorescences of grasses.
HYMENOPTERA SYMPHYTA (Sawflies)						
Argidae						
Arge cyanocrocea	0	0	1		Southern Widespread	The Rose Sawfly. The larvae fed on the leaves of Rosacae, especially brambles.
Tenthredinidae						
Athalia rosae	1	0	0		Southern Widespread	Very commonly found. The larva feeds on various species of crucifer, and was formerly a pest of turnips.
HYMENOPTERA PARASITICA (Ichneumon Wasps and allies)						
Chalcididae (Parasitic Wasps)						
Brachymeria minuta	1	0	0		Southern Widespread	Infrequently found. An internal parasite of sarcophagid flies.
Gasteruptiidae (Parasitic Wasps)						

Species	N	S	W	Status	Distribution	Notes
Gasteruption jaculator	1	0	0		Southern Restricted	Commonly found. A clepto-parasite of stem-nesting bees.
ACULEATE HYMENOPTERA (Ants, Bees and Wasps)						
Andrenidae (Mining Bees)						
Andrena alfkenella	1	0	0	RDB 3	Southern Restricted	Infrequently found. Strongly associated with calcareous grassland in south-eastern England, also associated with heathland edge in south-western England. Polylectic.
Andrena bicolor	0	1	1		Universal	Very commonly found. Polylectic. Ground nesting.
Andrena carantonica	0	0	1		Universal	Commonly found. Several females may share a common burrow entrance. Polylectic.
Andrena chrysosceles	0	0	1		Southern Widespread.	Commonly found. Especially associated with clay woodlands. Polylectic. Ground nesting.
Andrena dorsata	1	1	1		Southern Widespread	Commonly found. Often the dominant species in southern Britain. Polylectic.
Andrena flavipes	1	1	1		Southern Restricted.	Commonly found. Forms very large colonies, especially in bare ground. Polylectic. Ground nesting.
Andrena haemorrhoa	0	1	0		Universal	Commonly found. Females nest singly but males often congregate on blackthorn and hawthorn blossoms. Polylectic. Ground nesting.
Andrena labialis	1	0	1		Southern Widespread	Local species of old meadowlands. Oligolectic on the flowers of Fabacaea.
Andrena labiata	0	1	0	Nationally Scarce a	Southern Restricted	Locally frequent. Old meadowland and heathy grassland species. Polylectic, although it is often found associated with the flowers of Germander Speedwell, *Veronica chamaedrys*.
Andrena minutula	0	1	0		Universal	Commonly found. Polylectic. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Andrena minutuloides	1	1	1	Nationally Scarce a	Southern Restricted	Infrequently found. Strongly associated with sandy and calcareous grasslands. Polylectic.
Andrena nigroaenea	1	0	0		Universal.	Commonly found. Polylectic. Ground nesting.
Andrena nitida	1	1	0		Southern Widespread	Commonly found. A species of meadows. Polylectic. Ground nesting.
Andrena pilipes s.s	0	0	1	Nationally Scarce b	Southern Restricted.	A recent split, this is the commoner of two species formerly known as *Andrena pilipes*.
Andrena praecox	1	1	0		Southern Widespread	Locally frequently found. Oligolectic on blossom of sallows.
Andrena semilaevis	1	0	0		Universal	Commonly found. Polylectic, although with an apparent preference for Apiaceae.
Andrena wilkella	1	1	1		Universal	Frequently found in unimproved meadows. Oligolectic on Fabaceae. Ground nesting.
Panurgus calcaratus	1	1	0		Southern Widespread	Locally frequently found. Oligolectic, associated with yellow flowered Asteraceae (composites). Ground nesting.
Apidae (Bees)						
Anthophora bimaculata	1	1	1		Southern Restricted.	Locally commonly found in heathy localities. Nests in the ground. Polylectic.
Anthophora plumipes	0	1	0		Southern Widespread	Commonly found. Nests in the ground or cliffs and walls.
Bombus hortorum	1	1	1		Universal	Very commonly found. Polylectic. Nests underground in cavities.
Bombus humilis	1	0	1	UK BAP	Southern Widespread	BAP species. Frequently found. A declining species, more frequent in coastal localities of the south-west. Associated with taller grasslands, but with plenty of perennial flowers present. Surface nesting.
Bombus lapidarius	1	1	1		Universal	Very commonly found. Nests underground in cavities. Polylectic.
Bombus pascuorum	1	1	1		Universal	Very commonly found. Polylectic. Nests in surface litter.
Bombus pratorum	1	1	1		Universal	Very commonly found. Polylectic. Nests underground as well as in aerial cavities, including bird boxes.

Species	N	S	W	Status	Distribution	Notes
Bombus terrestris	1	1	1		Universal	Very commonly found. Polylectic. Nests underground in cavities.
Bombus vestalis	1	0	0		Southern Widespread	Commonly found. Breeds in nests of B. terrestris.
Ceratina cyanea	1	1	1	RDB 3	Southern Restricted	Locally frequently found. This small blue bee is our only Carpenter Bee, so called because of their habit of drilling burrows in wood in which to make their nests. They do this with their strong mandibles. *Ceratina* drills out the soft pith of dead ramble stems, both for nests which are provisioned during May and June, and for overwintering by the adults which emerge from these summer nests. Overwintering is communal, unmated males and females pack into drilled stems, following in the one which made the burrow. I have found up to ten adults in one stem.
Nomada fabriciana	0	0	1		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada flavoguttata	1	1	0		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada flavopicta	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found. A cleptoparasite of *Mellitta* bees.
Nomada fucata	1	0	1	Nationally Scarce a	Southern Restricted.	Frequently found. Becoming much more widespread recently. The host of this species, *Andrena flavipes*, has always been more widespread than the *Nomada*.
Nomada fulvicornis	1	1	0	RDB 3	Southern Restricted	Infrequently found. Predominantly a heathland bee, as are its host species, *Andrena bimaculata* and *A. tibialis*.
Nomada goodeniana	1	1	0		Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.
Nomada hirtipes	1	0	0	RDB 3	Southern Restricted	Rarely found. A Cleptoparasite of the rare mining bee *Andrena bucephala*.

Species	N	S	W	Status	Distribution	Notes
Nomada marshamella	0	1	0		Universal	Commonly found. Parasitises several *Andrena* species.
Chrysididae (Cuckoo Wasps)						
Chyrsis viridula	1	1	0		Southern Widespread.	Locally common. Parasitises the Eumenid wasps of the Genus *Odynerus*.
Hedychrum niemelai	1	0	0		Southern Restricted	Frequently found, but local. Sandy places. A cleptoparasite of *Cerceris* spp.. I have found the species associated with wind-blown sand deposits on Cornish sea cliffs. A species which is increasing its range at the moment.
Pseudomalus auratus	1	0	0		Southern Widespread	Frequently found, particularly from reared nests. Parasitises stem nesting aculeates.
Pseudospinola neglecta	0	1	0		Southern Widespread	Locally frequent. Parasitises the Eumenid wasp *Odynerus spinipes* and probably *O. melanocephala*.
Colletidae (Bees)						
Colletes daviesanus	0	0	1		Universal	Locally common, sometimes in extensive colonies on sandstone cliffs. Oligolectic on Asteracea.
Colletes halophilus	1	1	1	Nationally Scarce a. UK BAP	Southern Restricted.	A UK BAP species. Locally frequently found. The female gathers pollen from the flowers of Sea Aster, *Aster tripolium*. Nests are made in dry clay banks and sandy areas.
Colletes marginatus	0	0	1	Nationally Scarce a	Southern Widespread	Locally common in coastal dunes in southern Britain, with a population in the East Anglian Brecks. Often forages at Bramble. Polylectic although Westrich lists it as oligiolectic on Fabaceae. Ground nesting.
Colletes similis	0	1	0		Southern Widespread	Usually infrequently found, although the commonest Colletes on the coasts of Devon and Cornwall. Ground nesting. Oligolectic on Asteraceae.
Hylaeus brevicornis	1	1	0		Southern Widespread	Commonly found. Polylectic. Dead-stem nesting.

Species	N	S	W	Status	Distribution	Notes
Hylaeus cornutus	1	0	0	Nationally Scarce a	Southern Restricted	Frequently found. A species of open woodland edge habitat. Polylectic, but often associated with umbellifers. Become much commoner during the past ten years. Nests in hollow stems.
Hylaeus dilatatus	1	0	0		Southern Restricted	Locally frequently found. Nests in dead Bramble stems. Polylectic. Previously known as *Hylaeus annularis*.
Hylaeus hyalinatus	1	0	0		Southern Widespread	Commonly found, especially in coastal situations.
Hylaeus pectoralis	0	1	0		Southern Restricted	Infrequently found. A species of dry reedbeds and associated grassland. Utilises the old gall-chambers of the fly *Lipara lucens* on Common Reed, *Phragmites australis*, as a nesting site. Polylectic.
Crabronidae (Solitary Wasps)						
Astata boops	1	0	0		Southern Restricted	Frequently found, but local. Nests in bare, often sandy, places. Preys on shieldbug nymphs. Ground nesting.
Cerceris rybyensis	0	0	1		Southern Restricted	Locally commonly found. Heathland and downland. Preys on various solitary bees. Ground nesting.
Diodontus minutus	1	1	0		Southern Widespread	Commonly found in sandy places. Preys on aphids. Ground nesting.
Dryudella pinguis	0	0	1		Universal	Infrequently found. Dry, sandy places. Preys on shieldbug and Lygaeid bug nymphs. Ground nesting.
Ectemnius continuus	1	1	1		Universal	Commonly found in a variety of habitats. Dead-wood nesting. Preys on flies.
Ectemnius dives	1	0	0	Nationally Scarce b	Southern Widespread	Local and infrequently found. This species has been increasing its range and frequency over the past twenty years. Dead wood nesting. Hunts flies.
Ectemnius lituratus	0	1	0		Southern Widespread	Commonly found. Dead-wood nesting. Hunts flies.

Species	N	S	W	Status	Distribution	Notes
Ectemnius sexcinctus	0	0	1	Nationally Scarce b	Southern Widespread	Occasional specimens, but distributed widely in southern England. Dead-wood nesting. Hunts flies.
Entomognathus brevis	1	0	1		Southern Widespread	Commonly found in sandy places. Preys on small leaf-beetles (Chrysomellidae). Ground nesting.
Lestiphorus bicinctus	1	0	0	Nationally Scarce b	Southern Restricted	Infrequently found and local. Preys on froghoppers (Hemiptera Homoptera)
Lindenius albilabris	0	1	1		Universal	Commonly found. Preys on Mirid bugs or sometimes small Diptera. Nests in hard-packed bare ground.
Nysson trimaculatus	1	0	0	Nationally Scarce b	Southern Widespread	Infrequently found, a cleptoparasite of *Gorytes* spp.
Oxybelus uniglumis	0	1	0		Southern Widespread	Very commonly found in sandy places. Preys on flies. Ground nesting.
Passaloecus gracilis	1	0	0		Southern Widespread	Infrequently found. Preys on aphids on herbaceous plants. Dead wood nesting.
Pemphredon inornata	0	1	0		Southern Widespread	Commonly found. Preys on aphids. Dead-wood nesting.
Pemphredon lethifer	1	0	1		Southern Widespread	Commonly found. Preys on aphids. Nests in the soft pith of dead stems, such as bramble. The main chamber is helical down the stem, with side chambers dropping off this.
Psenulus pallipes	1	0	0		Southern Widespread	Infrequently found. Associated with woodland and hedgerows. Preys on aphids and nests in dead wood.
Psenulus schencki	1	0	0	Nationally Scarce a	Southern Restricted	Rarely found. Nests in hollow dead stems, although scarce it seems to have no strong habitat preference. Preys on Psyllid bugs (Homoptera)
Trypoxylon attenuatum	1	1	0		Universal	Commonly found. Preys on small spiders. Stem nesting.
Dryinidae (Solitary Waps)						
Gonatopus bicolor	0	0	1		Southern Widespread	Infrequently found. Parasitises Leaf-hoppers (Cicadellidae).
Formicidae (Ants)						

Species	N	S	W	Status	Distribution	Notes
Formica cunicularia	1	1	1		Southern Restricted	Locally commonly found. Southern heathland, downland and coastal localities.
Formica fusca	1	0	0		Universal	Commonly found in many habitats, although largely replaced by *F. lemani* towards the north.
Lasius flavus	0	1	0		Universal	Commonly found. The large, dome-shaped nests are an indicator of long-established pasture.
Lasius niger s.s.	1	1	1		Universal	Very commonly found. Dry habitats.
Leptothorax acervorum	1	0	0		Universal	Commonly found in many habitats.
Myrmica ruginodis	1	0	0		Universal	Commonly found in many habitats.
Myrmica sabuleti	1	0	1		Universal	Locally commonly found. Short turf and bare ground.
Myrmica scabrinodis	1	1	1		Universal	Commonly found in a variety of open habitats.
Myrmica specioides	1	1	0	RDB 3	Southern Restricted	Infrequently found. Associated with sparsely vegetated soils, often shingle or gravel. Increasing range during the 2000's.
Ponera coarctata	0	0	1	Nationally Scarce b	Southern Restricted	Rarely found. Largely associated with coastal areas with warmth. Subterranean.
Halicitdae (Mining Bees)						
Halictus rubicundus	1	0	0		Universal	Commonly found. A eusocial species. Ground nesting. Polylectic.
Halictus tumulorum	1	0	0		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum albipes	0	1	0		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum calceatum	1	1	1		Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.
Lasioglossum leucozonium	1	0	1		Southern Widespread	Commonly found in a variety of habitats. Polylectic. Ground nesting.
Lasioglossum malachurum	0	0	1	Nationally Scarce a	Southern Restricted	Commonly found. Eusocial species which forms large colonies. Formerly, a largely coastal species. Increased its range during the 1990s. Does not merit Nationally Scarce status now. Polylectic.

Species	N	S	W	Status	Distribution	Notes
Lasioglossum minutissimum	1	1	0		Southern Restricted	Locally frequently found. Associated with sandy places. Polylectic.
Lasioglossum pauperatum	0	1	0	RDB 3	Southern Restricted	Infrequently found. Largely associated with warm areas on sandy or chalky soils. Polylectic.
Lasioglossum pauxillum	1	1	1	Nationally Scarce a	Southern Restricted	Commonly found. Polylectic and eusocial. Became much commoner during the 1990s, does not merit Nationally Scarce status now. Ground nesting.
Lasioglossum punctatissimum	1	1	0		Southern Widespread	Commonly found. Sandy places. Polylectic.
Lasioglossum puncticolle	1	1	1	Nationally Scarce b	Southern Restricted	Locally frequently found. A species of clay meadows and woodland rides. Polylectic. Ground-nesting.
Lasioglossum villosulum	1	1	0		Universal	Commonly found. Polylectic. Ground nesting.
Sphecodes crassus	0	1	0	Nationally Scarce b	Southern Widespread	Infrequently found. Has been difficult to separate from closely related species. It could well be more widespread than previously thought. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes ephippius	1	0	1		Southern Widespread	Commonly found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes geoffrellus	0	1	0		Universal	Commonly found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes monilicornis	0	1	0		Universal	Commonly found. Cleptoparasitic on *Lasioglossum* and *Halictus* sp..
Sphecodes pellucidus	0	1	0		Universal.	Commonly found in sandy situations where its host, *Andrena barbilabris,* occurs.
Sphecodes puncticeps	0	1	0		Southern Widespread.	Infrequently found. Cleptoparasitic on *Lasioglossum* sp..
Sphecodes reticulatus	1	0	0	Nationally Scarce a	Southern Restricted.	Locally frequently found. Associated with grasslands on light soils. The host species are not clear, as it is found where its recorded host, *Lasioglosssum prasinum,* does not occur.
Sphecodes rubicundus	1	0	0	Nationally Scarce a	Southern Restricted	Infrequently found. A cleptoparasite of *Andrena labialis*, a bee of old meadowland; it may also cleptoparasitise *Andrena flavipes*.

Species	N	S	W	Status	Distribution	Notes
Megachilidae (Leafcutter and Mason Bees)						
Anthidium manicatum	1	0	0		Southern Widespread	Locally frequent, particularly in gardens. Polylectic. Cavity nesting.
Coelioxys conoidea	1	0	1		Southern Restricted.	Locally frequently found. Cleptoparasite of *Megachile maritima*.
Hoplitis claviventris	0	0	1		Southern Widespread	Infrequently found. Uses dead bramble stems in which to make its nest. Polylectic.
Megachile centuncularis	1	0	0		Universal	Locally frequently found. A species which has apparently declined greatly in the last hundred years. Polylectic. Cavity nesting.
Megachile leachella	1	1	1	Nationally Scarce b	Southern Widespread	Locally very common. Associated with duneland sites, but also known inland on the Brecks. Ground nesting. Polylectic.
Megachile versicolor	0	0	1		Universal	Commonly found. One of the leafcutter bees from the way it lines its nest chamber with sections of cut leaf. Any leaf will do, provided that it is supple. The sides are made from oval pieces, the ends from round ones. Cavity nesting. Polylectic.
Megachile willughbiella	0	0	1		Universal	Commonly found. Cavity and ground nesting. Polylectic.
Osmia caerulescens	0	0	1		Southern Widespread	Locally commonly found. Cavity nesting. Polylectic.
Osmia bicornis (rufa)	1	0	0		Universal	Locally common. Cavity nesting. Polylectic.
Osmia spinulosa	1	1	1		Southern Restricted	Locally frequently found on southern calcareous grasslands. Nest in snail-shells. Oligolectic on Asteraceae.Formerly known as *Hoplitis spinulosa*.
Stelis punctulatissima	1	0	0		Southern Widespread	Infrequently found. Often in gardens where it is as a cleptoparasite of *Anthidium manicatum*.
Melittidae (Bees)						
Melitta leporina	0	0	1	Nationally Scarce b	Southern Widespread	Infrequently found. Associated with legumes, especially White Clover, *Trifolium repens*. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Melitta tricincta	1	0	1	Nationally Scarce b	Southern Restricted	Locally commonly found. Oligolectic. Very strongly associated with Red Bartsia, *Odontites verna*, which provides the pollen with which the female stocks her nest. Ground nesting.
Pompilidae (Spider-hunting Wasps)						
Agenioidus cinctellus	1	0	0		Southern Restricted	Infrequently found. A species of cracks and crevices, such as upturned root-plates. Cavity nesting.
Anoplius infuscatus	0	1	0		Southern Widespread	Locally common on damp heaths and dunes. Preys on wolf spiders (Lycosidae). Ground nesting.
Priocnemis cordivalvata	1	0	0	Nationally Scarce b	Southern Widespread	A species of rides in mature broadleaf woodland, occasionally coppice. Ground nesting.
Sphecidae (Solitary Wasps)						
Ammophila sabulosa	1	0	1		Southern Widespread	Commonly found. Associated with sandy, and many coastal, localities. Hunts caterpillars. Ground nesting.
Tiphiidae (Solitary Wasps)						
Tiphia femorata	1	0	1		Southern Restricted.	Locally commonly found. Sandy places. Parasitises larvae of scarabaeid beetles.
Vespidae (Social and Potter Wasps)						
Ancistrocerus gazella	1	0	0		Southern Widespread	Commonly found. Nests in a variety of cavities. Provisions its nest with small caterpillars.
Ancistrocerus parietum	1	0	0		Universal	Infrequently found. Preys on lepidopteran larvae.
Dolichovespula sylvestris	0	0	1		Universal	Commonly found. Aerial nesting.
Odynerus melanocephalus	1	0	1	Nationally Scarce a. UK BA	Southern Restricted	Locally frequent. BAP species. Preys on weevil larvae, *Hypera*. Ground nesting.

Species	N	S	W	Status	Distribution	Notes
Odynerus spinipes	1	1	0		Southern Widespread	Erratic but can be commonly found in a locality. Can apparently suddenly appear after many years' absence- and then disappear. Makes large colonies on exposed banks. Each nest entrance is formed in the shape of a long chimney curving away from the bank. Preys on weevil larvae, *Hypera*.
Symmorphus bifasciatus	1	0	0		Southern Widespread	Locally frequently found in damp places. Nests in aerial cavities and dead wood. Provisions nest with larvae of leaf betles (Chrysomelidae).

APPENDIX B
Conservation Status Categories, Distribution and Abundance Terminology for Insects

Conservation status categories

RDB (Red Data Book) categories are based upon the most modern work, usually one of the English Nature Research and Survey in Nature Conservation reviews. Where these do not exist the category given in Shirt, D.B., 1987 The British Red Data Books: 2 is given. These categories may require revision in the light of new information but a new Red Data Book has yet to be compiled. Such revisions are indicated as p(rovisional). The new Red Data Book categories will be based on threat, of which distribution is only one part. This is likely to lead to a far more meaningful conservation assessment, as the number of squares recorded for any one species is highly susceptible to recorder effort, especially as data accumulates over time.

RDB 1. Endangered. Species currently (post 1970) known to exist in five or fewer ten-kilometre squares.

RDB 2. Vulnerable. Species in severely declining or vulnerable habitats, or of low known populations. Known to exist (post 1970) in ten, or fewer, ten-kilometre squares.

RDB 3. Rare. Species with small populations, not at present Endangered or Vulnerable, but which are felt to be at risk. Species currently known to exist (post 1970) in fifteen, or fewer, ten-kilometre squares.

RDB K. Species of undoubted RDB rank, but with insufficient information for accurate placement; includes possible recent arrivals.

Nationally Scarce. Species currently (post 1970) known to exist in one hundred, or fewer, ten-kilometre squares.

In some groups these are further sub-divided into:-

Nationally Scarce a. Species currently (post 1970) known to exist in thirty, or fewer, ten-kilometre squares.

Nationally Scarce b. Species currently known to exist in thirty-one to one hundred ten-kilometre squares.

Distribution categories

Distribution refers solely to the geographical extent of a species in the British Isles. Considerable confusion has been caused in the past by the varying meanings given to many assessments of species where geographic distribution has been confused with local abundance.

Distribution comments are based upon national status as far as is known (e.g. published distribution maps or the most recent taxonomic/ecological work giving distribution information). This may be supplemented by personal knowledge of the species.

A distribution classification, based on the known distribution range, is being developed. Where possible a provisional national distribution range status under this system is given. The basic system has been to divide the British Isles into thirds, largely ignoring the influence of altitude. The lines delineating these thirds run approximately:

i). Along a line from the Wash to the Severn and including South Wales.

ii) Along a line running through the Scottish Borders.

Universal. Distributed throughout England and Wales, with at least some extension into central and northern Scotland.

Widespread. Distributed in about three-quarters of England and Wales, perhaps with a few records in southern Scotland, but not significantly found in the northern third (Southern Widespread) or southern third (Northern Widespread) of the British Isles. (NB Northern Widespread species are found in Scotland as well.)

Restricted. Distributed in the southern (Southern Restricted) or northern (Northern Restricted) third of the British Isles only.

Abundance Comments

These often form the first part of the 'Notes' in the species information. An attempt has been made to make something akin to the well-established DAFOR system for botanical abundance recording, but with just four categories. These rate the expectation of finding the species, if all its life-cycle resource requirements and temperature and humidity regimes are apparently met on a site.

i) **Commonly found.** An experienced observer would expect to find the species 90% or more of the time where all its requirements are met.

ii) **Frequently found.** An experienced observer would expect to find the species 60% or more of the time where all its requirements are met.

iii) **Infrequently found.** An experienced observer would expect to find the species 10% or more of the time where all its requirements are met.

iv) **Rarely found.** An experienced observer would expect to find the species less than 10% of the time where all its requirements are met.

Abundance comments are much more subjective than distribution comments, being dependent upon the precise timing of survey visits and the timing of emergence of the insect species, as well as the experience of the observer. The method of recording, e.g. by sight or hand-netting, sweeping, beating, malaise trap, pan trap, may also affect the observed abundance. It is assumed that recording takes place under favourable conditions of habitat, weather and season. Often a species appears to be rarely found, until the particular way of looking for it is discovered, when it proves to be much more prevalent than previously thought.

Some species, however, seem to exist in low numbers at all times in all suitable places. This may reflect the species' position in its particular ecological pyramid. The abundance may have no connection with the distribution status; some Red Data Book species are numerous in their particular locations: some Universal species may only ever be found as singletons. Comments under this heading rely heavily upon the observer's accumulated experience as the rating given is a measure of the expectation of finding the species in a suitable habitat. Species living towards the edge of their range are often less frequent than they are in the middle of their range.

Specialist Terms for Ants, Bees and Wasps

Cleptoparasitic: A species taking over the stored provisions of another species to feed its young. This usually involves the cleptoparasite laying an egg in the nest of the host, but may involve oviposition on prey being transported by the host.

Socially Parasitic: The queens of some social aculeates do not initiate their own nests from scratch, but take over established nests of other species. Sometimes this results in the gradual replacement of the workers of one species by another. In other cases the parasite does not produce its own workers and the nest just produces males and females of the invading parasite before it dies out. In some ant species the chain of socially parasitic species may have several links.

Nesting situations: Bees and wasps may construct their nesting chambers in the ground (ground nesting) or in aerial situations (aerial nesting). Such aerial nests may be constructed in dead wood (dead-wood nesting), dead bramble stems or similar pith-filled stems (stem nesting) or in a variety of cavities (cavity nesting).

Nest provisioning terms: These relate (in bees) to the preferred sources of pollen for provisioning the

nest. Such resources may be very specific for some species. Nectar sources are not so clearly defined, although bees with longer tongues can forage at flowers with longer nectaries. Such flowers often have more concentrated nectar. The structure of the anthers and stigma is often related to the length of the tongue of the preferred pollinating insect.

Oligolectic: Bees which confine their pollen gathering activities to one species of plant, or a closely-related group of plants.

Polylectic: Bees which forage for pollen at a variety of different plants and show no particular preference.

Social organisation: The majority of bee and wasp species are **solitary**. One female provisions the nest and lays her eggs on the provisions. A number of solitary nesting insects may use the same small area when they are said to nest **colonially**. **Eusocial** species have a founding female who lays all the eggs, but the first insects to hatch (females) stay and help run the nest. At the end of the season males and females are produced. These mate and the newly mated females start their own nests. Usually only mated females overwinter. Some ant colonies have several mated females (queens).

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Annex EDP 30
An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent (Aseda, 2016)

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An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent

A report on behalf of Chris Blandford Associates

Issue 2
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Disclaimer

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1 Introduction

1.1 General

Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

The aquatic macroinvertebrate survey of waterbodies and wetlands was undertaken by Aseda on behalf of CBA. This report details the methodology, results and evaluation of the aquatic macroinvertebrate survey undertaken between May and June 2015.

1.2 Scope of the survey

The scope of the survey encompassed the following;

- identifying the various aquatic and wetland habitats within the proposed development areas;
- assessing the aquatic macroinvertebrate faunal assemblages within these aquatic habitats; and
- evaluating the conservation value of the various aquatic faunal assemblages.

1.3 Survey limitations

Ideally aquatic habitats would be sampled during two seasons; any single season survey provides an indication at best of the actual conservation value of a site. A second visit in a separate season allows for variation in life cycles. The timing of the current survey (late spring and early summer) means that a substantial portion of the aquatic faunal assemblage was present in the various waterbodies at an immature stage of development, and as such not identifiable to species. This was particularly the case for the water beetles and aquatic bugs. When interpreting the following findings it must be remembered that the actual faunal richness would therefore be somewhat higher than that observed.

The current survey draws its conclusions extrapolated from findings from a representative selection of the waterbodies within the area; sampling alternative waterbodies or sections of waterbody would inevitably yield subtly different findings.

Access on Botany Marsh was limited to the eastern portion of the marsh; waterbodies within the grazed western portion were therefore not included in the survey.

1.4 Key findings

1. Botany Marsh comprised a network of ditches, typically brackish and dominated by reeds. These ditches supported several species of conservation interest and were categorised as being between Fairly High and Very High conservation value. The newly created pond in the east of the marsh had a sufficiently rich faunal assemblage to be categorised as a UK BAP Priority Pond. Within Botany Marsh a total of 80 species of aquatic macroinvertebrate were recorded, eight of which were Threatened or Nationally Scarce status (and several with a Local distribution).
2. Swanscombe Marsh comprised a series of wetland areas amongst a network of interconnected ditches to the west and an area of reedbed, ditches and ponds to the east. Several species of conservation interest were found in the surveyed ditches on Swanscombe Marsh and as such these habitats can be considered as relatively high

conservation value. The two wetland areas supported notably rich faunal assemblages with several species conservation concern; both wetlands were categorised as Very High conservation value. Of the surveyed ponds, three were of the quality necessary for UK BAP Priority Pond status. Within Swanscombe Marsh a total of 154 species of aquatic macroinvertebrate were recorded, 11 of which were Threatened or Nationally Scarce status (and numerous with a Local distribution).

3. Both Botany Marsh and Swanscombe Marsh, on the basis of their water beetle assemblages, when compounding data from all surveyed waterbodies within each marsh, can be categorised as being Good wetland sites. Several uncommon species recorded in the current study show a high fidelity to coastal grazing marsh habitats.
4. Diffuse pollution across sections of the central peninsula, a legacy of historical industrial activities, was evident within a number of waterbodies, pond P3 in particular.
5. Surveyed waterbodies within the wider Swanscombe area comprised the Ebbsfleet corridor; the Ebbsfleet Stream and its riparian margins, and two nearby ponds, one balancing pond and one within a disused chalk pit. The Ebbsfleet Stream was categorised as between Moderate and High conservation value; one of the ponds achieved the quality of UK BAP Priority Pond status. Surveyed waterbodies in this area supported two species with Nationally Scarce status (and several with a Local distribution). These waterbodies and adjacent riparian zone provide a partial green corridor, albeit an interrupted corridor, between farmland to the south and the peninsula to the north.
6. A total of 199 species of aquatic macroinvertebrate were recorded amongst approximately 70,000 individuals in the current study. Amongst these, several species of conservation concern were recorded; one Vulnerable, three Near Threatened, 11 Nationally Scarce and 51 with a Local distribution within the UK. Of the wetland and aquatic plants recorded in and around the waterbodies eight had a Local distribution. A total of five ponds, of the seven surveyed, were of the quality necessary for UK BAP Priority Pond status.
7. Both Botany and Swanscombe Marshes combined could tentatively be categorised as being at least of County value, if not Regional.

2 Field sampling programme

2.1 Ponds and lakes survey

The seven ponds were sampled using methodology defined in the Freshwater Habitats Trust (formerly Pond Conservation Trust) PSYM (Predictive SYstem for Multimetrics) guidelines (Ponds Conservation Trust, 2002). Here, predictive environmental data were collected; such as pond area, pH and geology. Complete lists of wetland plants (emergent and submerged) present within the outer edge of the pond were recorded. Surveying was by walking or wading the pond perimeter. Where soft sediments prevented access to pond margins surveying was undertaken by Canadian canoe. Difficult specimens were sampled for microscopic identification, and/ or confirmation; these specimens were identified by Sharon Pilkington (Vegetation Survey and Assessment Ltd.). For the invertebrate survey a three-minute sample was collected where time was divided equally amongst each mesohabitat identified (examples of typical mesohabitats are stands of emergent *Carex* or flooded marginal grasses). Mesohabitats were netted, hard surfaces lightly 'kick sampled'. Accessibility, soft sediments and waterbody size meant five of the seven

ponds were accessed by canoe. An additional one minute search, for otherwise missed animals, was carried out; such as from the water surface.

Within each pond or lake, samples from between two and four mesohabitats were surveyed; each of these sub-samples were collected and analysed separately; these were then combined and analysed as a whole. This allowed interpretation of the conservation value of the various mesohabitats in addition to the waterbody as a whole. Samples were fixed in the field for laboratory sorting and identification. Sampling was carried out between 12th and 14th June 2015; during the summer season as defined by Environment Agency guidelines. This timing is within that required to compare results to those predicted by the PSYM model (June- August).

Sketch maps were drawn at each site detailing the location and extent of the various vegetative habitats within each waterbody. Selected environmental and habitat variables were recorded at each site.

2.2 Wetlands survey

Aquatic habitats within Black Duck Marsh on the Swanscombe peninsula were treated as two areas of wetland, one in the west (BDM-W) and one in the north (BDM-N). The western section comprised a series of ditches and two flooded fields. At the time of sampling, some sections of ditch were identifiable as discrete waterbodies; others were contiguous with the flooded fields. The northern section comprised two principal interlinked stretches of ditch and a small adjacent area of wetland.

Within the wetland areas between three and six wetland mesohabitats were identified and netted, as described for the ponds where 'net in the water' time was divided equally amongst each mesohabitat. A Canadian canoe was used to access the various wetland habitats. Were possible netting was by wading and sweep netting or lightly kicking the substratum amongst the various mesohabitats; otherwise sampling was by sweep netting vegetative habitats from the canoe.

These sub-samples were collected and analysed separately, then as a whole for each of the two wetland areas.

Samples were fixed in the field for laboratory sorting and identification. Sampling was carried out between 12th and 14th June 2015; during the summer season as defined by Environment Agency guidelines.

As described for the pond surveys, sketch maps were drawn and selected environmental and habitat variables were recorded for each wetland.

2.3 Stream and ditch surveys

The survey of the Ebbsfleet Stream and ditches on the Swanscombe peninsula was undertaken between the 29th and 30th May 2015; during the spring season as defined by the Environment Agency. A total of three sites were surveyed on the Ebbsfleet Stream; four ditches within the Botany Marshes; and five ditches on the Swanscombe Marshes. Each site comprised aquatic habitats representative of that stretch of the stream or ditch.

Semi-quantitative samples incorporating all the available mesohabitats within each reach in proportion to their abundance were taken. This was carried out in accordance with Environment Agency guidelines (Environment Agency and Institute of Freshwater Ecology, 1997 and Environment Agency, 2014) where River Invertebrate Prediction and Classification System (RIVPACS) sampling methodology was used to collect samples. Here the various watercourses were sampled by a combination of three-minute kick and sweep netting marginal and in-channel vegetation. Kick/sweep samples involve a combination of both kicking the substratum and

sweeping marginal and in-channel habitats for animals along a length of watercourse using a standard FBA pond-net. This was combined with a one-minute manual search of the water surface, submerged vegetation and boulders for macroinvertebrates where appropriate. Detailed site descriptions, including standard RIVPACS physical habitat variables, were recorded at each site.

3 Site location

Waterbodies and wetlands within the proposed development site were principally located within the Swanscombe Peninsula and the Ebbsfleet Stream corridor to the south.

The Swanscombe peninsula projects northwards into the Inner Thames Estuary; historically principally coastal grazing marsh. This area has since been substantially modified by industrial activities such as cement production and by the construction of the Channel Tunnel Rail Link in the southern section of the peninsula. Current wetland habitats are largely confined by residential and industrial developments either side of the peninsula.

The location of the sampling sites is provided in Table 1, Figure 1 and Figure 2. Photographs of the sampling sites are provided in Appendix 1.

Table 1 Location of the survey sites. *NGR's have been provided for sub-sample locations within Black Duck Marsh as these cover a wide geographical area; a single NGR has been provided to represent each pond including the various sub-sample locations.*

Date	**Macroinvertebrate sample site** [1]	**Site code**	**NGR**[2]
30/05/2015	Botany Marsh Ditch 1	BM1	TQ 60988 75363
30/05/2015	Botany Marsh Ditch 2	BM2	TQ 61059 75498
30/05/2015	Botany Marsh Ditch 3	BM3	TQ 61163 75573
30/05/2015	Botany Marsh Ditch 4	BM4	TQ 61120 75196
30/05/2015	Swanscombe Marsh Ditch 1 (ditch D2)	SM1	TQ 59942 75414
30/05/2015	Swanscombe Marsh Ditch 2 (ditch D12)	SM2	TQ 60458 76059
30/05/2015	Swanscombe Marsh Ditch 3 (ditch D11)	SM3	TQ 60405 75766
30/05/2015	Swanscombe Marsh Ditch 4 (ditch D10)	SM4	TQ 60388 75531
30/05/2015	Swanscombe Marsh Ditch 5 (ditch D16)	SM5	TQ 60733 75686
13/06/2015	Black Duck Marsh - West 1	BDM-W-1	TQ 59589 75374
13/06/2015	Black Duck Marsh - West 2	BDM-W-2	TQ 59743 75469
13/06/2015	Black Duck Marsh - West 3	BDM-W-3	TQ 59680 75389
13/06/2015	Black Duck Marsh - West 4 (ditch D4)	BDM-W-4	TQ 59578 75354
13/06/2015	Black Duck Marsh - West 5 (ditch D3)	BDM-W-5	TQ 59574 75331
13/06/2015	Black Duck Marsh - West 6 (ditch D4)	BDM-W-6	TQ 59636 75480
13/06/2015	Black Duck Marsh - North 1	BDM-N-1	TQ 59995 75700
13/06/2015	Black Duck Marsh - North 2 (ditch D8)	BDM-N-2	TQ 60080 75541
13/06/2015	Black Duck Marsh - North 3 (ditch D9)	BDM-N-3	TQ 60052 75721
12/06/2015	New Pond, Botany Marshes	NP	TQ 61280 75297
12/06/2015	Pond P3	P3	TQ 60352 75944
13/06/2015	Pond P5	P5	TQ 60503 75352
14/06/2015	Pond P6 - North	P6-N	TQ 60618 75481
14/06/2015	Pond P6 - South	P6-S	TQ 60563 75431
12/06/2015	Bamber Pit Pond	BPP	TQ 61031 74609
14/06/2015	Balancing Pond	BP	TQ 61538 73309
29/05/2015	Ebbsfleet Stream 1	ES1	TQ 61766 73641
29/05/2015	Ebbsfleet Stream 2	ES2	TQ 61624 73183
29/05/2015	Ebbsfleet Stream 3	ES3	TQ 61624 73071

Notes:
[1] Original CBA ditch labelling is provided in parenthesis.
[2] NGR's refer to a single point within the sample site; the sample will have been taken over a wider area in the vicinity of this point.

Waterbodies within the study area exhibited varying degrees of brackish influence, a consequence of their varying proximity to and hydrological connectivity with the neighbouring estuarine environment (Table 2).

Table 2 Selected environmental variables for survey sites.

Site code	**Altitude** (m)	**Conductivity** (µS cm^{-1})	**pH**
BM1	0	2445	7.1
BM2	1	>4000	7.3
BM3	2	2927	7.8
BM4	1	>4000	8.0
SM1	1	3240	7.7
SM2	3	2367	8.4
SM3	5	1236	8.0
SM4	4	3764	8.3
SM5	1	>4000	7.6
BDM-W-1	3	3556	7.4
BDM-W-2	1	3537	7.8
BDM-W-3	2	3530	7.7
BDM-W-4	5	3876	7.4
BDM-W-5	6	3542	7.3
BDM-W-6	1	3604	7.6
BDM-N-1	2	3360	7.6
BDM-N-2	2	3615	7.4
BDM-N-3	2	3369	7.7
NP	2	2247	8.5
P3	3	3815	8.6
P5	1	1005	7.6
P6-N	0	2140	7.3
P6-S	1	1042	8.0
BPP	10	983	7.8
BP	5	760	7.5
ES1	3	809	7.4
ES2	6	674	7.1
ES3	8	797	7.0

Notes:

Chemical parameters refer to values at time of sampling only.

Where conductivity is greater than 2000 µS cm^{-1} a waterbody is considered brackish.

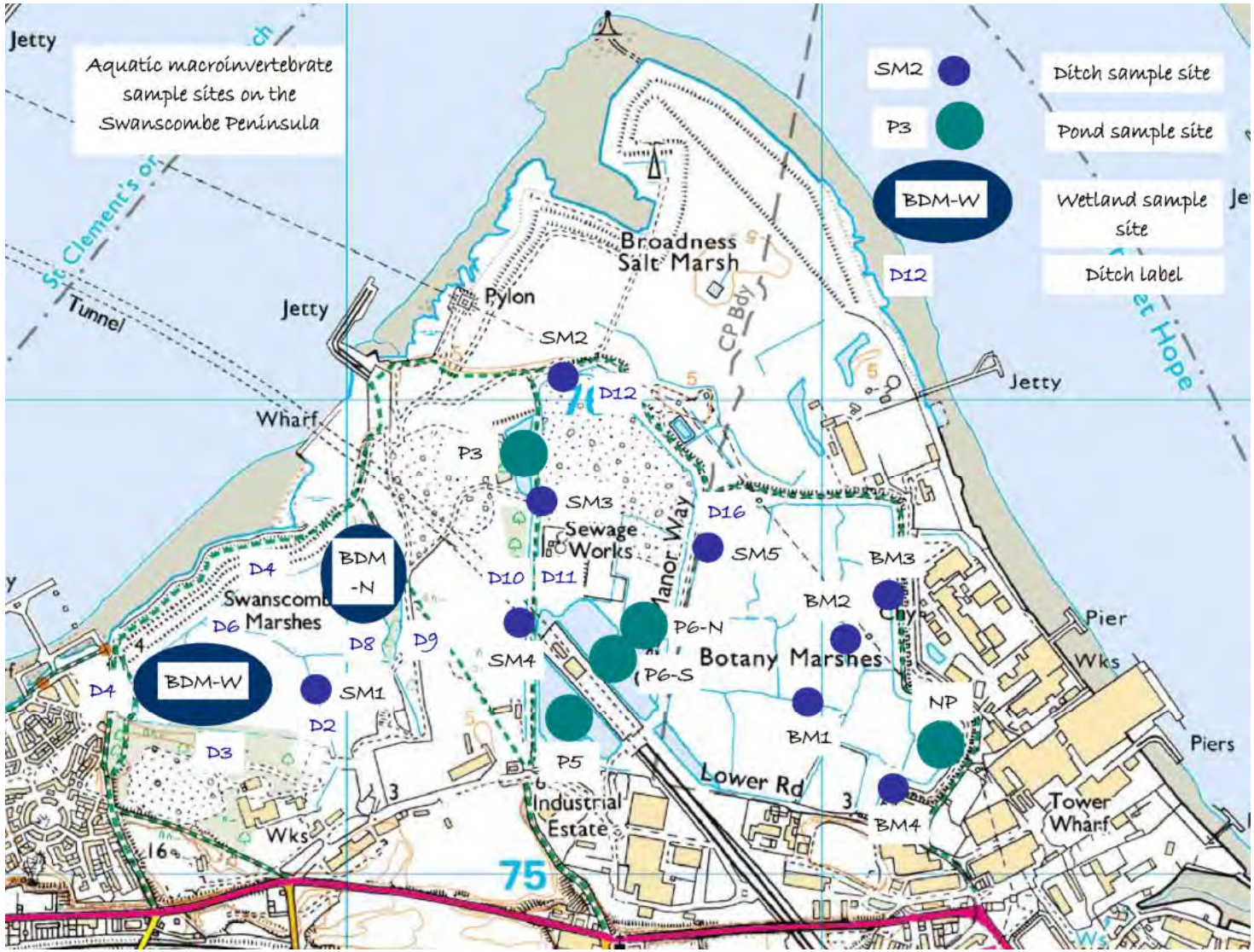

Figure 1 Location of aquatic macroinvertebrate sample sites on the Swanscombe Peninsula.

Base map source: CBA

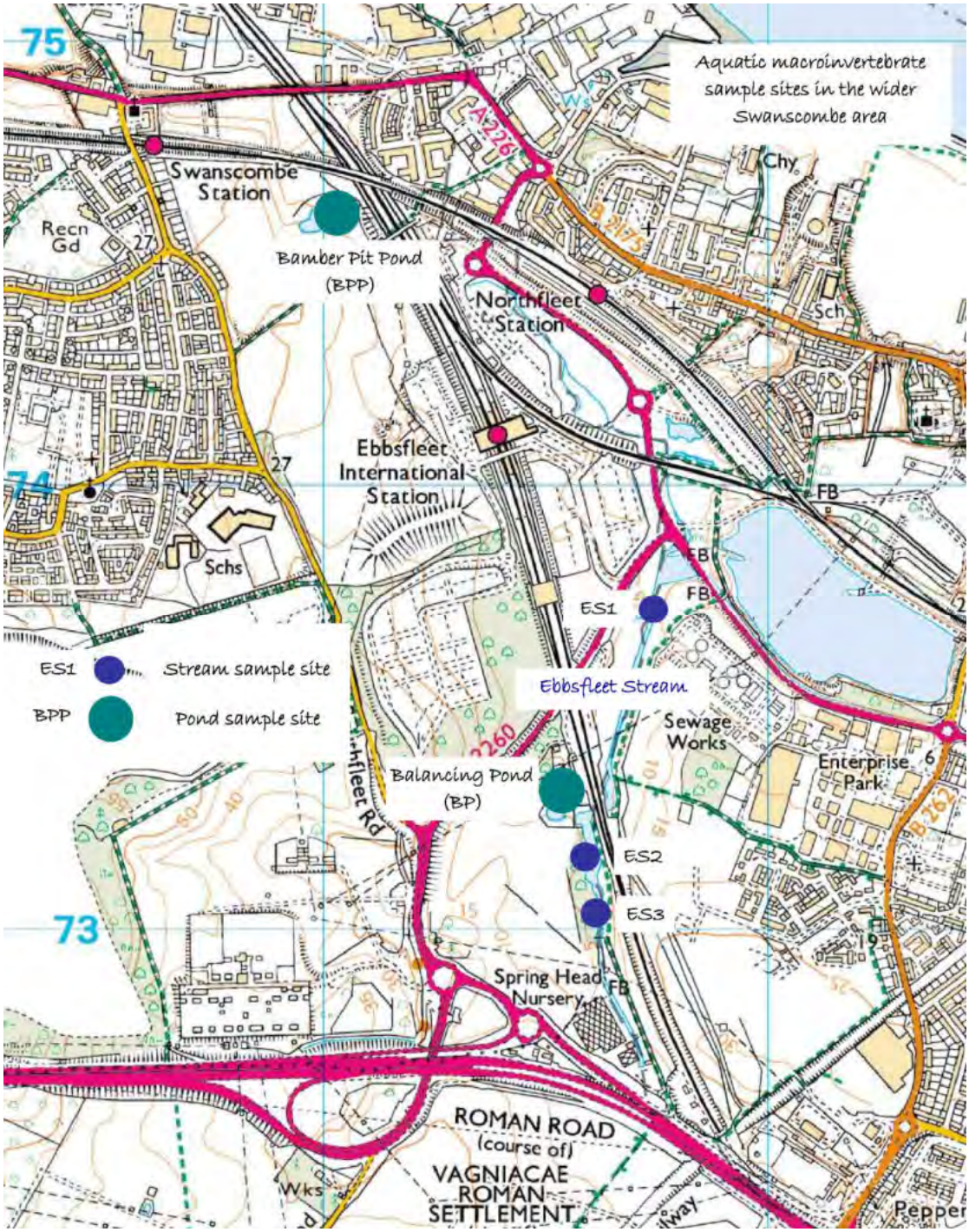

Figure 2 Location of sampling sites in the wider Swanscombe area.

Base map source: CBA

4 Analyses

4.1 Laboratory analyses

Macroinvertebrate samples were initially fixed in the field using 4% formaldehyde. Samples were analysed in the laboratory by both Aseda and GJ Robinson (GJ Robinson, Haltwhistle). Macroinvertebrates were sorted from plant material and detritus by placing small amounts of sample in a white tray, immersing in water and removing and counting all invertebrate taxa. This was repeated until the entire sample had been sorted. Sorted specimens were preserved in 70 % industrial methylated spirits.

Invertebrates were identified to the highest taxonomic level practical, with the exception of the Chironomidae (non-biting midges) and Oligochaeta (segmented worms) these were identified no further than family or order. Identification keys and atlases used are provided in the reference section. Where invertebrates were present as incomplete specimens, only the portions, which had a head and a thorax or a thorax and abdomen, were included in the relative abundances (Environment Agency and Institute of Freshwater Ecology, 1997).

A lack of taxonomic information renders specific identification of a number of taxa unfeasible; for example the larvae of Diptera (true-flies), early instar larvae of Trichoptera (caddisflies), Hemiptera (aquatic bugs) and Odonata (dragonflies and damselflies), all the larvae and females of some Coleoptera (beetles). These taxa are therefore identified as far as reliably attainable. Bivalve specimens were identified by I. Killeen (Malacological Services, Dublin); *Stratiomys* specimens confirmed by M. Drake.

4.2 Data analysis

Macroinvertebrate abundance data were investigated in terms of tolerance to organic pollution (biological water quality), conservation assessment and taxonomic diversity.

4.2.1 Biological water quality

Macroinvertebrate families have values (Biological Monitoring Working Party (BMWP) scores) allocated (1 to 10) according to their assumed tolerance to organic pollution. High scores indicate a family is pollution intolerant and vice versa. These scores were assigned to species on the basis of their tolerance in combined riffle-pool habitats; hence are applicable to flowing water environments rather than still. The BMWP score for a sample refers to the sum of the values assigned to the BMWP families recorded in the sample. Average Score per Taxon (ASPT) refers to the BMWP score divided by the number of BMWP taxa in the sample and represents an index of organic pollution (for details refer to Wright, Sutcliffe and Furse, 2000).

When interpreting BMWP scores certain limitations of the metrics must be borne in mind. Variation amongst habitat types allows these habitats to support different aquatic fauna. This variability in fauna need not simply reflect variability in biological water quality and as such differences amongst observed metrics may not be directly attributable to differences in organic enrichment amongst the waterbodies.

River Invertebrate Prediction and Classification System (RIVPACS) analysis (Clarke *et. al.,* 2004) was carried out on survey results for the Ebbsfleet Stream. Using the physico-chemical characteristics of a site RIVPACS predicts the number of taxa, the BMWP score and ASPT that would be found if the watercourse were unpolluted and undisturbed. The differences between the predicted reference metrics and those observed from the sample collected indicate the potential extent of organic pollution and or habitat degradation. The observed values divided by the predicted values are referred to as the Environmental Quality Indices (EQIs). An EQI

approximately equal or greater than one infers good biological water quality; low values indicate poor biological water quality.

In addition to the above metrics the abundance-weighted WHPT-ASPT (Whalley Hawkes Paisley Trigg) metric has been calculated on the stream and ditch samples. This metric is sensitive to the impacts of organic enrichment in addition to 'general degradation'; it is calculated using sensitivity scores for each taxon (as is the ASPT above) adjusted for their relative abundance in a sample (WFD-UKTAG, 2014).

4.2.2 *Conservation assessment*

The conservation value of a species is described according to its perceived vulnerability and geographical distribution within the U.K.

Revised definitions and criteria (IUCN, 2001) for assigning the conservation status to a species are based on qualifying thresholds within a set of six criteria (rapid decline; small, fragmented, declining or fluctuating range; small or declining population; very small population; very small area of occupancy; and quantifiable probability of extinction).

Revised categories are adapted from the Red Data List system initiated by the IUCN in 1966. New categories include *Extinct in the Wild* and *Critically Endangered*; whilst *Endangered* and *Vulnerable* are maintained albeit defined differently; those defined as *Rare* in the old system are typically assigned to the new category *Near Threatened*. *Nationally Scarce* is a status particular to the UK. The hierarchical relationship between these revised threat categories is provided in Figure 3.

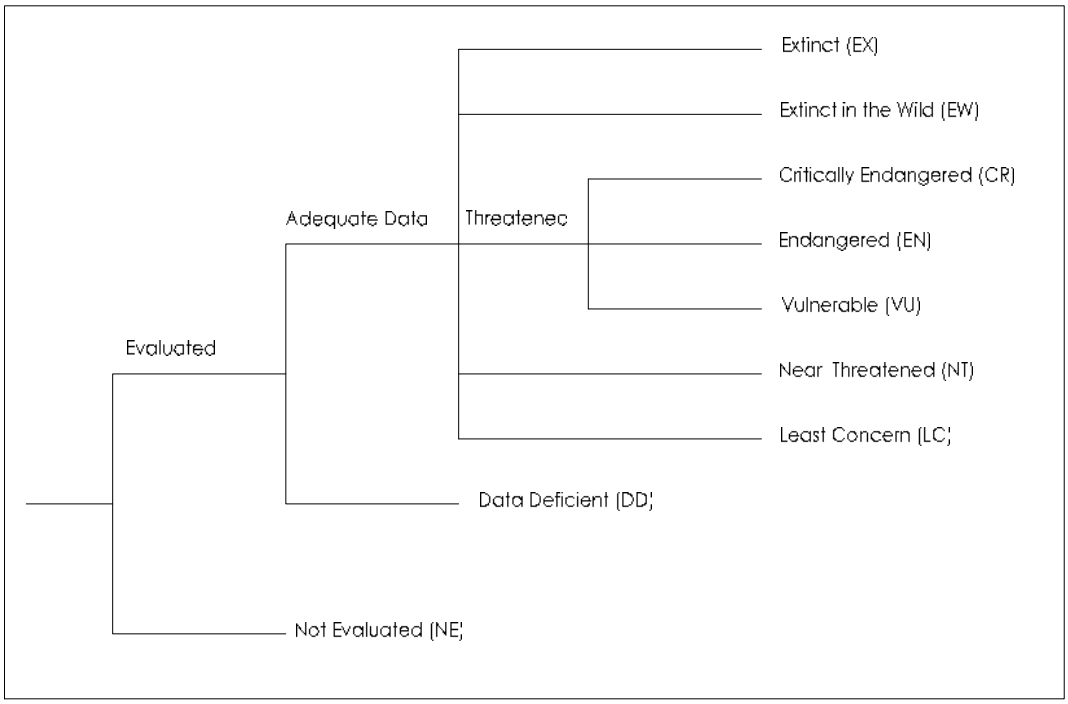

Figure 3 Hierarchical relationship of IUCN threat categories (*source: IUCN, 2001*)

The conservation status assigned to a species is typically based on data from a collection of published lists, reviews and atlases. Analyses using status values to assign a value to a site, such as that used by Chadd and Extence (2004), generally use the original IUCN categories in assigning a species conservation score (e.g., those published in Shirt, 1987). Recently published lists and reviews using the revised IUCN guidelines include a review of scarce and threatened

water beetles (Foster, 2010) and Odonata (Daguet *et al*, 2008). In the following calculation of the conservation status metrics, where a species status has been revised, its status scores has been adjusted accordingly.

Rarity, threat and protected status categories used for invertebrates (both original and revised) are as follows:

HD	Listed in Annexes IIa and /or IVa of the EC Habitats Directive (and/or Appendix II of the Bern Convention) and covered by the Conservation of Habitats and Species Regulations 2010
Sch5	Included in Schedule 5 of the Wildlife and Countryside Act, 1981
EX	Extinct
EW	Extinct in the Wild
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
LC	Least Concern
DD	Data Deficient – insufficient information to ascertain Red List status
NE	Not Evaluated
E	British Red List: Endangered (RDB 1)
V	British Red List: Vulnerable (RDB 2)
R	British Red List: Rare (RDB 3)
K	British Red List: Insufficiently known but may qualify for red list status (RDB K)
GVU	Vulnerable on the IUCN Global Red List
GNT	Globally Near Threatened (IUCN)
BAP	UK Biodiversity Action Plan priority species
NS	Restricted Range: Nationally Scarce – occurring as native in 16 to 100 x 10 km squares in Britain (a replacement for Na and Nb)
Na	Restricted Range: Notable a – occurring in 16 to 30 10 x 10 km squares in Britain
Nb	Restricted Range: Notable b – occurring in 31 to 100 10 x 10 km squares in Britain
Local	Confined to a particular habitat or geographic area, or too widespread to warrant Nationally Scarce status but infrequently encountered.
Common	Species not listed in any of the above categories.

The conservation value of the ponds was assessed using National Pond Survey methodology (Ponds Conservation Trust, 1998). Here conservation value was assessed using Species Rarity Indices (SRI). Here each species is assigned a score depending on its national rarity; the average for the site providing the SRI (Table 3).

Table 3 Species rarity scores used in pond conservation assessments.

Status	**Species rarity score**
Common (LC)	1
Local	2
Nationally Scarce	4
R/RDB3 (NT)	8
V/RDB2 (VU)	16
E/RDB1 (EN)	32

Taxa whose status has been reassessed for the revised IUCN categories have been aligned as shown in parenthesis.

The conservation value of the ponds is then assessed using the following table.

Table 4 Provisional categories for assessing the conservation value of ponds.

Wetland plants	
Low	Few plants (≤ 8 species) and no Local species (SRI=1).
Moderate	Below average number of wetland plants (9-22 species) or SRI 1.01 – 1.19.
High	Above average number of species (≥ 23 species) or SRI of 1.2 – 1.49. No Nationally Scarce or RDB /Threatened species.
Very High	More than one Nationally Scarce or RDB/Threatened species or SRI of ≥ 1.5; or exceptionally rich plant assemblage (≥ 40 species).
Aquatic invertebrates	
Low	Few invertebrates (≤ 10 species) and no Local species (SRI = 1).
Moderate	Below average number of species (11-32) or SRI of 1.01 – 1.19.
High	Above average number of species (33-49 species) or SRI of 1.2 – 1.49. No Nationally Scarce or RDB/Threatened species.
Very high	More than one Nationally Scarce or RDB/Threatened species or SRI of ≥ 1.5; or exceptionally rich invertebrate assemblage (≥ 50 species).

Since August 2007 ponds of high ecological quality have been defined as a UK BAP Priority Habitat. The draft Pond Habitat Action Plan (HAP) targets principally aim to maintain and expand both the extent and quality of ponds defined as being UK BAP Priority Ponds; therefore each pond in the survey area has been assessed for these criteria (see Table 5). A pond only needs to meet one of these criteria to be classified as a Priority Pond.

Table 5 Criteria used in identifying a UK BAP Priority Pond (Fairclough and Nicolet, 2008).

Criterion 1	Habitats of International importance (meeting Annex 1 of the Habitats Directive criteria).
Criterion 2	Species of high conservation importance. Ponds supporting RDB species, UK BAP species, those protected under the Wildlife and Countryside Act Schedule 5 and 8, Habitats Directive Annex II species, a Nationally Scarce aquatic wetland plant species or three Nationally Scarce aquatic invertebrate species.
Criterion 3	Exceptional assemblages of key groups. Ponds supporting exceptional populations of key species; (i) based on criteria specified in selection of biological SSSI's (amphibians or dragonflies), (ii) exceptionally rich sites for plants or animals; supporting ≥ 30 wetland plant species or ≥ 50 aquatic macroinvertebrate species.
Criterion 4	Ponds of high ecological quality; PSYM 'high' category (i.e. PSYM score ≥ 75 %).
Criterion 5	Ponds with limited geographical distribution recognised on basis of age, rarity of type, historical or landscape context.

The overall conservation value of the macroinvertebrate assemblages within the survey area were assessed using the Community Conservation Index (CCI) (Chadd and Extence, 2004). This index incorporates both rarity and taxon richness. Species were assigned a Conservation Score (CS) based on their known conservation status in the UK, both locally and nationally (as listed in Chadd and Extence, 2004). As described above, the revised status of several species listed in newly published reviews have been incorporated in the analyses. An average conservation score is then calculated by dividing the number of contributing species by the sum of these scores (∑CS). This value is then multiplied by a Community Score (CoS) provided in Table 6, itself being derived from the rarest taxon present (CS_{max}) or the BMWP, to provide the CCI. Where the CS_{max} and BMWP produce different CoSs, the highest is used to calculate the CCI (see Equation 1).

Equation 1 Community Conservation Index $$CCI = \frac{\sum CS}{n} \; x \; CoS$$

Table 6 Community Score (CoS) categories (after Chadd and Extence, 2004).

CoS	**BMWP**	**CS_{max}**
15	>301	10
12	251-300	9
10	201-250	8
7	151-200	7
5	101-150	5 or 6
3	51-100	3 or 4
1	1-50	1 or 2
0	0	Scoring taxa absent

CCI's can be interpreted using Table 7.

Table 7 Interpretation of CCIs

CCI	**Conservation value**	
0 to 5	Low	Site supporting only common species and/or low taxon richness.
5 to 10	Moderate	At least one species of restricted distribution and/or moderate taxon richness.
10 to 15	Fairly high	At least one uncommon species, or several of restricted distribution, and/or high taxon richness.
15 to 20	High	Several uncommon species, at least one may be nationally rare, and/or high taxon richness.
>20	Very high	Several rarities, including species of national importance or at least one RDB/Threatened species, and/or very high taxon richness.

4.2.3 PSYM assessment

Pond quality was assessed using PSYM methodology. This method, developed by the Ponds Conservation Trust (now Freshwater Habitats Trust), assesses biological water quality of still waters using plant and invertebrate assemblages. Analyses use a combination of environmental variable data and the following six pond metrics:

1. Number of submerged and emergent plant species.
2. Trophic Ranking Score (TRS); here plant species are assigned scores depending on their affinity to particular nutrient status waters and an average value provides the TRS.
3. Uncommon species index; this is the number of plant species which can be described as having a rarity value of Local or above.
4. Average Score per Taxon (ASPT, as described earlier).
5. Number of dragonfly and alderfly families.
6. Number of water beetle families.

The relationship between the observed and expected metrics as predicted for an unimpaired waterbody is used to provide a General Quality Assessment (GQA) categorisation for the pond. Results are expressed as an Index of Biological Integrity; these are grouped into four categories (Table 8).

Table 8 Interpretation of PSYM results.

Index of Biological Integrity	**Interpretation**
0 - 25 %	Very poor
25 - 50 %	Poor
50 – 75 %	Moderate
75 – 100 %	Good

4.2.4 Taxonomic diversity

Taxonomic diversity incorporating elements of both species richness and evenness was calculated using Equation 2. The Shannon index (H) indicates the degree of uncertainty of an individual in a sample being from a certain species; it is sensitive to the number of rare species in a sample and is therefore biased towards species richness.

Equation 2 Shannon index: $$\hat{H}' = -\sum_{i=1}^{S}\left[\left(\frac{n_i}{n}\right)\ln\left(\frac{n_i}{n}\right)\right]$$

where n_i is the number of individuals of the ith species, n the total number of individuals and S the species number.

Taxonomic dominance (D) was estimated using Equation 3.

Equation 3 Berger-Parker index: $D = {}^{n_{max}}\!/_{n}$

where n_{max} is the number of individuals in the most abundant species.

4.2.5 Determination of site importance

There are no published criteria upon which to base an evaluation of the conservation importance of the macroinvertebrate faunal assemblages of aquatic habitats.

Nevertheless, a combination of species richness and rarity metrics from the current study were compared to available published data for aquatic habitats in order to assign a tentative conservation value.

Metrics were selected from those outlined in Foster and Eyre (1992), Drake (2004) and Palmer *et. al.*, (2010). Drake (2004) provides data relating to wetland/grazing marsh habitats in the UK; here grazing marshes are described as having Local, Regional or National importance on the basis of their invertebrate assemblages using countrywide data sources. Findings from Swanscombe and Botany Marshes have been compared to these.

Criteria used are the number of Threatened and Nationally Scarce species; species richness; the number of brackish grazing-marsh habitat-faithful species; the conservation value of various waterbodies using SRI and CCI; and the Species Quality Index for water-beetles.

The Species Quality Index represents the average Species Quality Score assigned to water-beetle species found in the survey as defined by Foster and Eyre (1992).

5 Ecological quality of the waterbodies in the survey area

Photographs of the survey sites are provided in Appendix 1. Full details of the aquatic macroinvertebrates recorded during the current survey have been provided in Appendix 3, as has a list of the principal aquatic flora. Sketch maps of the ponds illustrating the various mesohabitats within the ponds and the principal areas of wetland and aquatic flora is provided in Appendix 2.

Within the following discussion the fauna recorded in the various ponds has been described for each of the sub-sampling stations separately, representing the various mesohabitats within the ponds. The objective of this approach was to more fully understand the relationship between the fauna and habitat within the ponds. When describing the relative diversity and ecological quality of the ponds, the various metrics have been calculated on the combined data from the various sub-samples from each pond, to allow a direct comparison amongst the different waterbodies.

Table 9 Species of conservation interest recorded in the survey

Species	**Common name**	**Status**	**Site/s**
Graphoderus sp. [1]	Diving Beetle	VU	BDM-W, BDM-N
Hydrochus ignicollis	Water Beetle	NT	SM1, SM2, SM4, SM5, BDM-N
Berosus luridus	Water Beetle	NT	NP
Hydrophilus piceus	Great Silver Diving Beetle	NT	BDM-W, P5
Agabus conspersus	Diving Beetle	NS	BP
Graptodytes bilineatus	Diving Beetle	NS	BM1
Hygrotus parallelogrammus	Diving Beetle	NS	NP
Rhantus frontalis	Diving Beetle	NS	SM5, BDM-W, BDM-N
Gyrinus paykulli	Whirligig Beetle	NS	SM4, BDM-W, BDM-N
Haliplus apicalis	Crawling Water Beetle	NS	BDM-W
Peltodytes caesus	Crawling Water Beetle	NS	BDM-W, BDM-N, P5, P6-N
Helophorus alternans	Water Beetle	NS	BM1, BM3, BM4, NP, SM2, P5, P6-S, ES3
Ochthebius viridus	Water Beetle	NS	BM2, BDM-N, P5
Enochrus halophilus	Water Beetle	NS	BM3, SM2, BDM-N
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N
Cyrnus flavidus	Caddisfly	Local	BP, BPP
Oecetis furva	Caddisfly	Local	BDM-N
Caenis luctuosa	Mayfly	Local	BDM-N, ES1, ES2
Caenis robusta	Mayfly	Local	BDM-N, P6-N, P6-S
Aeshna mixta	Migrant Hawker - Dragonfly	Local	P5
Brachytron pratense	Hairy Dragonfly	Local	P6-N, P6-S
Acilius sp. [2]	Lesser Diving Beetle	Local	BDM-N
Agabus didymus	Diving Beetle	Local	ES2
Graptodytes pictus	Diving Beetle	Local	SM4
Hydroglyphus geminus	Diving Beetle	Local	NP
Hygrotus impressopunctatus	Diving Beetle	Local	BM1, SM2, SM5, BDM-W, P6-S
Hygrotus versicolor	Diving Beetle	Local	SM4, BDM-W
Laccophilus hyalinus	Diving Beetle	Local	BPP
Rhantus suturalis	Diving Beetle	Local	BM3, BDM-W
Gyrinus caspius	Whirligig Beetle	Local	SM4, P3

Species	Common name	Status	Site/s
Haliplus obliquus	Crawling Water Beetle	Local	SM1
Helophorus griseus	Water Beetle	Local	NP, SM5, P5, P6-N
Ochthebius dilatatus	Water Beetle	Local	BM1, BM2, SM2
Anacaena bipustulata	Water Beetle	Local	SM1, SM5, BDM-N, ES2
Berosus affinis	Water Beetle	Local	BM3, NP, P5, P6-N, P6-S
Berosus signaticollis	Water Beetle	Local	NP, P6-N
Cercyon sternalis	Water Beetle	Local	BM1, SM5
Cercyon tristis	Water Beetle	Local	BM1, BDM-W, P6-S
Cymbiodyta marginellus	Water Beetle	Local	BM1, SM1, SM2, SM4, SM5
Enochrus testaceus	Water Beetle	Local	BDM-N, P3
Helochares lividus	Water Beetle	Local	NP, SM1
Laccobius colon	Water Beetle	Local	NP
Hygrobia hermanni	The Squeak Beetle	Local	P5
Arctocorisa germari	Aquatic Bug	Local	P6-N
Corixa affinis [3]	Aquatic Bug	Local	SM3, BDM-W, P6-N, P6-S
Cymatia coleoptrata	Aquatic Bug	Local	BDM-W, P5, P6-S
Hesperocorixa moesta	Aquatic Bug	Local	ES1
Micronecta scholtzi	Aquatic Bug	Local	SM4, P6-S
Paracorixa concinna	Aquatic Bug	Local	BDM-W, BDM-N, P6-N
Sigara iactans	Aquatic Bug	Local	NP, P6-N, P6-S
Sigara limitata	Aquatic Bug	Local	P6-N
Sigara selecta	Aquatic Bug	Local	P6-S
Renatra linearis	Water Stick Insect	Local	P5, P6-N
Microvelia reticulata	Aquatic Bug	Local	SM4, BDM-W, BDM-N, P3, P6-N, P6-S
Anisus leucostoma	White-lipped Ram's-horn Snail	Local	BPP
Gyraulus albus	White Ram's-horn Snail	Local	BDM-W, P6-S, BP
Hippeutis complanatus	Flat Ram's-horn Snail	Local	SM1, BDM-W, P6-N
Valvata cristata	Flat Valve Snail	Local	BDM-W, BPP
Chaoborus crystallinus	Phantom Midge	Local	SM1, SM4, SM5
Dixa dilatata	Meniscus Midge	Local	BPP
Dixella autumnalis	Meniscus Midge	Local	BM2, BDM-N
Oplodontha viridula	Common Green Colonel – Soldierfly	Local	BDM-N, P5

Species	Common name	Status	Site/s
Oxycera rara	Four-barred Major - Soldierfly	Local	ES3
Oxycera nigricornis	Delicate Soldier - Soldierfly	Local	ES3
Alboglossiphonia heteroclita	Leech	Local	NP
Hemiclepsis marginata	Leech	Local	BP

[1] *Graphoderus* sp. larvae; larvae unidentifiable to species. Only likely to be *Graphoderus cinereus* (L.); *G. bilineatus* is Regionally Extinct and *G. zonatus* is only known from Woolmer Forest, Hampshire within the UK (CR). Therefore specimens have been given the status for *G. cinereus*.

[2] A*cilius* sp. larvae; larvae unidentifiable to species; listed as Local – the most abundant status of species in the genera.

[3] *Corixa affinis /Corixa dentipes* nymphs; unidentifiable to species; both species have Local status within the UK.

Table 10 Non-native species of aquatic macroinvertebrate recorded in the survey.

Species	Common name	Sites
Crangonyx pseudogracilis	Crustacean	BDM-W, P5, P6-N, P6-S, ES1, ES3
Potamopyrgus antipodarum	Jenkin's Spire Snail	BM3, NP, P6-N, P6-S, BP
Physa group	Water Snail	BM1, BM3, NP, SM1, SM3, BDM-W, BDM-N, P5, P6-N, P6-S, ES2, ES3

Table 11 Species recorded in the current survey listed on the Kent Rare and Scarce Species Inventory (Kent and Medway Biological Records Centre data) and the Essex Red Data List (Essex Field Club County Records data).

Taxon	**Common name**	**Status**	**Sites recorded**
Kent Rare and Scarce Species Inventory			
Hygrotus parallelogrammus	Diving Beetle	NS	NP
Rhantus frontalis	Diving Beetle	NS	SM5, BDM-W, BDM-N
Enochrus halophilus	Water Beetle	NS	BM3, SM2, BDM-N
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N
Essex Red Data List			
Agabus conspersus	Diving Beetle	NS	BP
Hydroglyphus geminus	Diving Beetle	Local	NP
Hygrotus parallellogrammus	Diving Beetle	NS	NP
Cercyon sternalis	Water Beetle	Local	BM1, SM5
Cercyon tristis	Water Beetle	Local	BM1, BDM-W, P6-S
Helochares lividus	Water Beetle	Local	NP, SM1
Helophorus alternans	Water Beetle	NS	BM1, BM3, BM4, NP, SM2, P5, P6-S, ES3
Ochthebius viridus	Water Beetle	NS	BM2, BDM-N, P5
Oxycera rara	Four-barred Major - Soldierfly	Local	ES3
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N
Demetrias imperialis [1]	Ground Beetle	NS	SM1, SM3, P6-N, P6-S

[1] This species though not aquatic was recorded in the listed samples.

Table 12 Community Conservation Indices for sampling sites

Site	CCI	Conservation value
Botany Marsh		
BM1	30.0	Very High
BM2	14.9	Fairly High
BM3	15.5	High
BM4	13.4	Fairly High
NP	27.8	Very High
Swanscombe Marsh		
SM1	26.7	Very High
SM2	29.2	Very High
SM3	7.9	Moderate
SM4	31.2	Very High
SM5	33.2	Very High
BDM-W	31.5	Very High
BDM-N	35.8	Very High
P3	12.1	Fairly High
P5	29.5	Very High
P6-N	20.7	Very High
P6-S	18.7	High
Wider Area		
ES1	8.7	Moderate
ES2	7.4	Moderate
ES3	16.0	High
BPP [1]	11.5	Fairly High
BP [1]	16.1	High

CCI calculated using CS max except [1] where CCI values were equal for CCI BMWP and CS max.

Table 13 Diversity indices for sampling sites

Site	Number of individuals	Number of species	Shannon index	Berger-Parker index
Botany Marsh				
BM1	2196	26	1.38	0.60
BM2	2959	24	0.98	0.71
BM3	2154	43	2.09	0.48
BM4	1422	19	1.35	0.44
NP	2909	51	2.61	0.32
Swanscombe Marsh				
SM1	3363	33	2.45	0.30
SM2	2047	36	1.67	0.49
SM3	542	16	1.74	0.54
SM4	788	31	1.37	0.71
SM5	964	24	1.12	0.76
BDM-W	8862	67	2.51	0.36
BDM-N	9702	61	1.89	0.49
P3	2374	21	0.63	0.88
P5	3230	50	2.19	0.38
P6-N	4557	62	2.90	0.24
P6-S	6181	65	2.90	0.27

Site	Number of individuals	Number of species	Shannon index	Berger-Parker index
Wider Area				
ES1	1566	29	2.22	0.31
ES2	1497	30	2.62	0.15
ES3	2700	40	0.96	0.81
BPP	2663	45	2.62	0.26
BP	6417	71	2.64	0.34

Table 14 Conservation value of surveyed ponds, using the Species Rarity Index (SRI). *NS indicates Nationally Scarce.*

Site	No. plant species [1]	Plant SRI	No. NS or Threat-ened plant species	No. invert. species [2]	Invert. SRI	No. NS or Threat-ened species	Pond Conservation Value [3]
NP	4	1.25	0	51	1.41	3	Very High [4]
P3	4	1.00	0	21	1.14	0	Moderate [5]
P5	8	1.25	0	50	1.44	4	Very High [4]
P6-N	10	1.40	0	62	1.26	1	Very High [4]
P6-S	16	1.31	0	65	1.23	1	Very High [4]
BPP	8	1.00	0	43	1.19	0	Moderate [5]
BP	9	1.00	0	70	1.16	1	Very High [5]

[1] Only includes species listed in National Pond Survey manual (Pond Action, 1998).

[2] Only includes families of Diptera.

[3] As defined on the basis of the aquatic macroinvertebrate fauna.

[4] High conservation value on the basis of wetland plants

[5] Low conservation value on the basis of wetland plants

Table 15 Results of PSYM analyses on surveyed ponds. *EQI refers to Ecological Quality Index (the ratio of the observed to the predicted results); the IBI refers to the Index of Biological Integrity.*

Metric	NP	P3	P5	P6-N	P6-S	BPP	BP
No. submerged & marginal plant species							
Predicted	19.1	35.2	20.7	29.8	32.0	35.9	28.0
Actual	4	4	7	9	15	6	6
EQI	0.21	0.11	0.34	0.30	0.47	0.17	0.21
IBI	0	0	1	1	1	0	0
No. uncommon plant species							
Predicted	3.1	5.7	3.5	4.9	5.2	5.9	4.7
Actual	1	0	2	4	5	1	1
EQI	0.33	0.00	0.57	0.81	0.96	0.17	0.21
IBI	1	0	2	3	3	0	0
Trophic Ranking Score							
Predicted	8.80	8.81	8.63	8.78	8.80	8.80	8.66
Actual	8.60	8.65	8.26	8.55	8.87	7.83	7.88
EQI	0.98	0.98	0.96	0.97	1.01	0.89	0.91
IBI	3	3	3	3	3	1	2
ASPT							
Predicted	5.17	5.15	5.11	5.12	5.13	5.14	5.19
Actual	4.16	5.00	4.64	5.12	4.48	5.33	5.06
EQI	0.81	0.97	0.90	1.00	0.88	1.03	0.98
IBI	2	3	3	3	3	3	3
No. Odonata & Megaloptera families							
Predicted	3.26	3.18	3.38	3.11	3.15	3.16	3.32
Actual	1	1	4	3	2	2	3
EQI	0.31	0.31	1.18	0.96	0.64	0.63	0.90
IBI	1	1	3	3	2	2	3
No. Coleoptera families							
Predicted	3.82	3.80	3.78	3.77	3.79	3.79	3.85
Actual	6	4	7	7	5	3	7
EQI	1.57	1.05	1.85	1.86	1.32	0.79	1.82

Metric	NP	P3	P5	P6-N	P6-S	BPP	BP
IBI	3	3	3	3	3	3	3
Sum of Individual Metrics	10	10	15	16	15	9	11
Index of Biotic Integrity (%)	56%	56%	83%	89%	83%	50%	61%
PSYM quality category [1]	Moderate	Moderate	Good	Good	Good	Moderate	Moderate
Is this a Priority Pond? [2]	No	No	Yes	Yes	Yes	No	No

[1] PSYM quality category represents an IBI >75 % = Good, 50-75 % = Moderate, 25-50 % = Poor, < 25 % = Very Poor.
[2] Priority Pond status using criterion 4 (i.e. having a PSYM score > 75 %); a pond may attain Priority Pond status if meets any one of the 5 criteria listed in Table 5.

Table 16 Biotic scores for surveyed ditches on the Swanscombe Peninsula.

Site	No. BMWP families	BMWP	ASPT	WHPT	SQI[1]
BM					
BM1	9	32	3.56	4.02	1.4
BM2	11	43	3.91	4.65	1.3
BM3	17	82	4.82	4.32	1.2
BM4	11	47	4.27	3.73	1.2
SM					
SM1	16	76	4.75	3.91	1.4
SM2	10	48	4.80	4.24	1.5
SM3	11	46	4.20	3.59	1.1
SM4	11	57	5.18	4.46	1.5
SM5	6	29	4.83	4.74	1.5
Buglife[2]					*1.5*

[1] Average invertebrate conservation status score (Species Quality Index or SQI) for sample using scoring system for taxa provided in Palmer *et. al.* 2010.

[2] Mean values for samples from brackish ditches in southern England and Wales (using 2000 µS cm^{-1} as threshold). Data from Palmer *et. al.* 2010.

Table 17 Biotic scores for samples taken from the Ebbsfleet Stream

Site	Observed			Predicted			EQI		
	No. BMWP families	BMWP	ASPT	No. BMWP families	BMWP	ASPT	No. BMWP families	BMWP	ASPT
ES1	18	80	4.4	24	112	4.6	0.74	0.72	0.97
ES2	18	79	4.4	24	112	4.6	0.74	0.71	0.95
ES3	19	89	4.7	23	113	4.8	0.82	0.79	0.97
	N-Taxa		WHPT						
ES1	24		4.09						
ES2	22		4.11						
ES3	27		4.27						

5.1 Botany Marsh

Botany Marsh is composed of a western portion of coastal grazing marsh grazed by cattle and an un-grazed eastern portion which consisted of widespread scrub and Common Reed *Phragmites australis*. The aquatic macroinvertebrate survey sites were entirely within the eastern portion of the marsh.

Within Botany Marshes the water was typically neutral to alkaline (pH 7.1 to 8.5) and brackish (2247 to >4000 µS cm^{-1}; where a value in excess of 2000 µS cm^{-1} is classed as brackish) (Table 2). Emergent and marginal *Phragmites* provided the dominant vegetative habitat within most of the waterbodies. Water levels were typically low across the eastern marsh.

5.1.1 Botany Marsh ditches

Much of the ditch network on Botany Marsh was dry or ponded at the time of the survey; many ditches were completely overgrown with *Phragmites* or scrubbed, typically with hawthorn and or brambles.

Temporal variation in water levels in ditches was observed between May and June, with a number of ditches drying up between these months.

Most ditches had a simple trapezoidal profile, with bank slope angle of approximately 40 º and freeboard between 1 – 1.5 m. There was evidence of recent clearing and deepening to sections of ditch in the east of the marsh.

5.1.1.1 Botany Marsh ditch 1 (BM1)

At the time of sampling ditch 1 was shallow (average depth 13 cm) and brackish (2445 µS cm^{-1}). It supported dense *Phragmites* both marginal and emergent within the channel; which provided the only vegetative habitat for aquatic fauna. The channel was heavily shaded by *Phragmites* (approximately 90 %); the substratum was silt.

A total of seven species of water beetle of conservation interest were recorded in BM1; two Nationally Scarce *Graptodytes bilineatus* and *Helophorus alternans* and five with a Local distribution within the UK (Table 9). The CCI index categorised this ditch as being of Very High conservation value (Table 12).

A total of 26 species were recorded amongst approximately 2,200 individuals; the most abundant of which accounted for 60 % of this total (*Asellus aquaticus*, the Water Hog Louse). The average species richness for brackish ditches in England and Wales as surveyed in Palmer *et. al.*, (2010) was 38, substantially higher than recorded here.

5.1.1.2 Botany Marsh ditch 2 (BM2)

BM2 supported dense *Phragmites* both emergent within the channel and marginal, this provided shading over the channel (approximately 70 % shaded). The water at the time of sampling was shallow, neutral and brackish (Table 2). Whilst surveying for aquatic macroinvertebrates a single 9-spined Stickleback *Pungitus pungitus* was recorded in the ditch.

A total of three species of conservation interest were recorded in BM2; the Nationally Scarce water beetle *Ochthebius viridus* and two species with a Local distribution, one water beetle and one meniscus midge (Table 9).

The CCI index indicated this ditch to be of Fairly High conservation value. A total of 24 species amongst approximately 3,000 individuals were recorded with the most abundant taxon, the

Chironomidae, the non-biting midges, accounting for approximately 70 % of these individuals (Table 13).

5.1.1.3 Botany Marsh ditch 3 (BM3)

BM3 was largely open (approximately 5 % shaded by emergent vegetation). The water was notably warmer than neighbouring stretches (17 ºC), alkaline (pH 7.8) and brackish (2927 µS cm^{-1}). In addition to the emergent species recorded elsewhere, this stretch supported floating and submerged plant species providing a variety of vegetative habitats e.g., Brackish Water-crowfoot *Ranunculus baudotii* and Common Duckweed *Lemna minor*.

A pair of Broad-bodied Chasers *Libellula depressa* was observed laying at this site, an Azure Damselfly *Coenagrion puella* was also observed flying around the ditch margins.

Whilst surveying for aquatic macroinvertebrates 15 3-spined Sticklebacks *Gasterosteus aculeatus*, 31 9-spined Sticklebacks *Pungitius pungitus* and 36 unidentified fry were recorded; as were 15 smooth/palmate newt larvae *Lissotriton vulgaris* / *L.helveticus*.

A total of four species of conservation interest were recorded in this ditch; all water beetles; two Nationally Scarce, *Helophorus alternans* and *Enochrus halophilus,* and two Local. *E. halophilus* is listed in the Kent Rare and Scarce Species Inventory (Table 11). The CCI index categorised this site as High conservation value.

This ditch supported 43 species, the highest species richness of the surveyed ditches in Botany Marsh. The most abundant species recorded here, the non-native *Potamopyrgus antipodarum*, the Jenkin's Spire Snail, accounted for approximately one half of the total 2,000 individuals.

Biotic scores such as BMWP and ASPT (and the revised WHPT) should be interpreted with some caution in such low and slow-flowing habitats; these indices were not designed for this type of waterbody. Unsurprisingly these indices indicated the biological water quality to be similar amongst the sampled ditches; with BM3 one of the highest amongst Botany Marsh ditches (ASPT of 4.8; WHPT 4.3).

5.1.1.4 Botany Marsh ditch 4 (BM4)

BM4 was densely shaded by scrub (approximately 70 % shading) with no aquatic macrophytes observed. The water was shallow, alkaline (pH 8.0) and brackish (> 4000 µS cm^{-1}).

Whilst surveying for aquatic macroinvertebrates 23 newt larvae *Lissotriton vulgaris* / *L. helveticus* were recorded.

This ditch supported a single species of conservation interest, the Nationally Scarce water beetle *Helophorus alternans*. The CCI index categorised this site as Fairly High conservation value.

BM4 exhibited the lowest species richness of the Botany Marsh surveyed ditches; with 19 species recorded amongst approximately 1,400 individuals. The Chironomidae were the most abundant taxon accounting for approximately 44 % of the total number of individuals.

5.1.1.5 Botany Marsh ditches – synopsis

The surveyed ditches in Botany Marsh supported a number of species of conservation interest and were categorised as being between Fairly High and Very High conservation value. The average invertebrate conservation status score for each ditch was similar or slightly less than the average for brackish ditches in England and Wales (Palmer *et. al.*, 2010 data).

The species richness of these ditches was, however, notably below the average found in brackish ditches in England and Wales, in three of the four surveyed ditches.

5.1.2 Botany Marsh ponds

5.1.2.1 New Pond (NP)

This pond had been recently created and substratum and banks remained largely devoid of vegetation. Emergent vegetation along the eastern bank was largely *Phragmites* and Common Reedmace *Typha latifolia*; patches of *Ranunculus baudotii* provided submerged vegetative habitat within the open water (see sketch map, Appendix 2).

The water was turbid, alkaline (pH 8.5) and brackish (2247 μS cm^{-1}).

An adult Broad-bodied Chaser *Libellula depressa* and a Blue-tailed Damselfly *Ischnura elegans* were observed flying around the pond at the time of sampling. The former species is a known early coloniser.

Whilst surveying for aquatic macroinvertebrates a single 3-spined Stickleback *Gasterosteus aculeatus* was recorded in the pond.

New Pond sub-sample 1 (NP1):

Sub-sample 1 was taken within the marginal emergent vegetation of the pond.

Amongst this marginal pond habitat three water beetle species of conservation interest were recorded; one Nationally Scarce (*Helophorus alternans*) and two Local (Table 9).

New Pond sub-sample 2 (NP2):

Sub-sample 2 was taken within the patches of *Ranunculus baudottii.*

This habitat supported 10 species of conservation interest; one aquatic bug and nine water beetles, including the Near Threatened *Berosus luridus* and the Nationally Scarce *Hygrotus parallelogrammus* and *Helophorus alternans* (Table 9). *H. parallelogrammus* is listed in the Kent Rare and Scarce Species Inventory.

New Pond – synopsis:

Newly created habitats, such as NP, frequently support fauna favouring recently created and/or cleared waterbodies which provide exposed or thinly vegetated mineral substratum habitat. For example, the diving beetle *Agabus nebulosus,* recorded in both surveyed mesohabitats; and the Local water beetle *Berosus signaticollis*, recorded in NP2, are both known to favour newly created habitats.

Both the Species Rarity Index (SRI) and CCI define New Pond as Very High conservation value. A total of 51 species were recorded amongst approximately 3,000 individuals.

PSYM analysis, which incorporates both wetland plant and aquatic macroinvertebrate metrics, categorised New Pond as Moderate ecological quality, with an IBI (Index of Biological Integrity) of 56 % (Table 15). The richness and rarity of aquatic plants were notably lower than predicted, as was the dragonfly and alderfly faunal richness. A rich dragonfly assemblage is typically associated with varied vegetative habitat structure. Water beetle taxonomic richness was however higher than predicted, if the site were pristine.

NP meets more than one of the criteria necessary for the pond to be defined as a UK BAP Priority Pond (Table 5); with species richness greater than 50 and the presence of species of high conservation value.

5.1.3 Botany Marsh – synopsis

Aquatic macroinvertebrate fauna recorded in Botany Marsh typically favour neutral or alkaline, well-vegetated still or slow-flowing waterbodies. Several species known to tolerate or favour brackish conditions were recorded in Botany Marsh e.g., the diving beetle *Hygrotus parallelogrammus* and the water beetle *Enochrus halophilus,* both confined to brackish waters.

The faunal assemblage included several water beetle species favouring stagnant or muddy water; conditions widespread amongst the shallow or ponded densely vegetated ditches.

The relative richness of both aquatic bug and beetle assemblages indicates the relative importance and or variability of the marginal vegetative habitats within the marsh as a whole. A total of 38 species of water beetle were recorded within Botany Marsh waterbodies. The Species Quality Index (representing the average Species Quality Score assigned to water-beetle species found in the survey as defined by Foster and Eyre (1992)) for the marsh was 2.17, where anything greater than 2.0 indicates a *good* wetland site.

Botany Marsh supported several species of conservation interest; one Near Threatened, five Nationally Scarce and 12 with a Local distribution. The marsh supported one pond of UK BAP Priority Pond status.

5.2 Swanscombe Marsh

The Swanscombe Peninsula includes wetland habitats such as reedbeds and grazing marsh, nevertheless it has been heavily modified by industrial activity. Cement production and the tipping of its waste material have substantially modified the southern and central areas of the peninsula. The Channel Tunnel Rail Link emerges from beneath the Thames in the central area of the peninsula; mitigation for its construction included the creation of open water and reedbed wetland habitat within this area. *Phragmites* was by far the most the dominant wetland plant species in this area.

The western section of the peninsula, known as Black Duck Marsh (BDM), comprised a mosaic of reedbed and open water, bisected by a network of ditches. A rise in water levels in recent years has flooded areas of pre-existing grassland with brackish water; these water levels appear to fluctuate, creating a wetland habitat with variable water depths (and salinities) both spatially and temporally across the marsh. As in the central area, *Phragmites* dominated this area along with patches of willow scrub (*Salix* spp).

5.2.1 Swanscombe Marsh ditches

Water levels on Swanscombe Marsh were notably higher than observed on Botany Marsh. Nevertheless some stretches of ditch in the central area of the peninsula were dry at the time of the survey.

Most ditches had a simple non-stepped profile, with bank slope angle varying between 10 - 80 º with the profile beneath the water typically steeper; freeboard was generally less than 1 m.

Ditches in the western marsh were generally deeper and more open than those in the central area.

5.2.1.1 Swanscombe Marsh ditch 1 (SM1)

Swanscombe Marsh ditch 1 was located at the eastern fringe of a section of reedbed within BDM. The ditch was open (approximately 10 % shading), relatively deep (approximately 1 m) and brackish (3240 μS cm^{-1}). Marginal vegetation was dominated by *Phragmites* with occasional willowherb and willow. Open water supported both *Lemna minor* and Ivy-leaved Duckweed *Lemna trisulca.*

An Azure Damselfly *Coenagrion puella* was observed flying around the ditch margins. Whilst surveying for aquatic macroinvertebrates smooth newt *Lissotriton vulgaris* were observed.

Within SM1 seven species of conservation interest were recorded; the Near Threatened water beetle *Hydrochus ignicollis* and six species with a Local distribution, four water beetles, one aquatic snail and one phantom midge.

The CCI index categorised this site as Very High conservation value.

SM1 supported 33 species amongst in excess of 3,000 individuals. The faunal assemblage was fairly evenly distributed with no one species accounting for more than 30 % of the total number of individuals.

Biotic scores for ditches on Swanscombe Marsh were generally similar to one another (ASPT for SM1 was 4.75; the range for the five surveyed ditches was 4.20 - 5.18); not unsurprising given the hydrological connectivity of the ditch network (Table 16).

5.2.1.2 Swanscombe Marsh ditch 2 (SM2)

SM2 flows along the northern margin of the NE Tip, in the central section of the peninsula. This section of landfill was dominated by *Phragmites*. The channel was largely open; the water was brackish (2,367 μS cm^{-1}; CMS-Enviro data indicated this fluctuated with values of approximately 900 – 21,000 μS cm^{-1} recorded, 2006-2015). Water depth was observed to fluctuate with the tide. Marginal *Phragmites* and reed stem debris provided the principal habitats within the channel.

Whilst surveying for aquatic macroinvertebrates smooth newt *Lissotriton vulgaris* were observed.

SM2 supported six species of conservation interest; all water beetles, the Near Threatened *Hydrochus ignicollis*, the Nationally Scarce *Helophorus alternans* and *Enochrus halophilus*, and three further species with a Local distribution. The CCI index categorised this site as being of Very High conservation value.

This site exhibited the highest species richness of the surveyed Swanscombe Marsh ditches, with 36 species amongst approximately 2,000 individuals recorded. This species richness approached the average (37.7 species) for brackish ditches in England and Wales (Palmer *et. al.*, 2010 data). The most abundant taxon, the Chironomidae, accounted for approximately one half of these individuals (Table 13).

5.2.1.3 Swanscombe Marsh ditch 3 (SM3)

SM3, adjacent to the dismantled sewage treatment works, in the central peninsula, was dominated by *Phragmites* both emergent within the channel and marginal (providing approximately 40 % channel shading). The water was notably less brackish than other surveyed ditches within the network.

Leachate from adjacent land was visible immediately beyond the riparian vegetation to this ditch; whether this entered the ditch is undetermined.

Whilst surveying for aquatic macroinvertebrates 3-spined Stickleback *Gasterosteus aculeatus* were observed.

This ditch supported one aquatic bug species with a Local distribution and was classed as Moderate conservation value using the CCI index, the lowest value of the surveyed sites on the peninsula.

SM3 was the least speciose of the surveyed ditches, with 16 species amongst approximately 500 individuals. The Chironomidae, the most abundant taxon, accounted for in excess of 50 % of the total number of individuals.

This ditch exhibited the highest tolerance to organic enrichment of Swanscombe Marsh ditches (Table 16).

5.2.1.4 Swanscombe Marsh ditch 4 (SM4)

SM4 was a largely open ditch (less than 5 % channel shading), notably wider (4 m) and deeper (approximately 1.5 m) than neighbouring ditches. At the time of sampling water was brackish 3764 μS cm^{-1}).

Marginal vegetation was largely *Phragmites* and brambles; there was no observable in-channel vegetation.

Whilst surveying for aquatic macroinvertebrates 3-spined Stickleback *Gasterosteus aculeatus* and unidentified fry were observed.

SM4 supported nine species of conservation interest; the Near Threatened *Hydrochus ignicollis*, the Nationally Scarce whirligig beetle *Gyrinus paykulli* and a further seven species with a Local distribution (four water beetles, two aquatic bugs and one phantom midge). The CCI index categorised this site as Very High conservation value.

A total of 31 species amongst approximately 800 individuals were recorded at SM4; the most abundant taxon, the Chironomidae, accounted for approximately 70 % of these individuals.

5.2.1.5 Swanscombe Marsh ditch 5 (SM5)

SM5 ran along the western boundary of Botany Marsh and the eastern boundary of Swanscombe Marsh NE Tip. This ditch was shallow (average 35 cm) and largely choked with *Phragmites*, providing approximately 80 % channel shading. Open water was restricted to isolated pockets amongst dense reed stems and stem debris.

At the time of sampling the water was brackish (in excess of 4000 μS cm^{-1}); this ditch was dry during the June pond survey.

SM5 supported eight species of conservation interest; the Near Threatened water beetle *Hydrochus ignicollis*, the Nationally Scarce diving beetle *Rhantus frontalis* and six species with a Local distribution, five water beetles and one phantom midge. *R. frontalis* is listed in the Kent Rare and Scarce Species Inventory. The CCI index categorised this site as Very High conservation value.

Within this site, 24 species amongst approximately 1,000 individuals were recorded; the most abundant taxon, the Chironomidae, accounted for approximately three quarters of these individuals.

5.2.1.6 Swanscombe Marsh ditches –synopsis

The surveyed ditches in Swanscombe Marsh typically supported several species of conservation interest and as such can be considered of relatively high conservation value. Nevertheless the species richness of these ditches was typically below the average found in brackish ditches in England and Wales.

5.2.2 Swanscombe Marsh wetlands

5.2.2.1 Black Duck Marsh – west (BDM-W)

BDM-W comprised a network of typically *Phragmites*-lined ditches amongst areas of flooded grassland and reedbeds. Across this section of the marsh the water exhibited conductivity levels indicative of brackish conditions (between 3537 – 3876 µS cm^{-1}).

Survey effort within the marsh was divided equally amongst six mesohabitats reflecting the habitat variability of the site (see sketch map, Appendix 2).

Black Duck Marsh – west - sub-sample 1 (BDM-W-1):

This sub-sample represented an area of flooded grassland (western field) among clumps of rush *Juncus* and *Salix* spp. scrub. The water was typically shallow, neutral and brackish (3556 µS cm^{-1}).

This flooded grassland supported four species with a Local distribution; two water beetles, one aquatic bug and one aquatic snail.

The aquatic bugs were by far the most abundant order here.

Black Duck Marsh – west - sub-sample 2 (BDM-W-2):

BDM–W-2 represented an area of fringing reedbed along the eastern margin of the flooded eastern field. Water levels in this section of the marsh were reasonably deep.

Within these marginal emergents the Nationally Scarce whirligig beetle *Gyrinus paykulli* (typically found skulking in reedbeds) and a Local aquatic bug (*Microvelia reticulata*, a species favouring marginal vegetative habitats) were recorded.

Black Duck Marsh – west - sub-sample 3 (BDM-W-3):

This sub-sample represented an area of open flooded grassland (the eastern field); water levels were typically deeper here than in the neighbouring western field. Extensive reedbeds fringed large sections of this open water area; brambles and scrub along the southern fringe were in notably poor condition.

This section of flooded grassland supported a single species of conservation interest, the Vulnerable diving beetle *Graphoderus* sp. (larval specimens only identified only as *Graphoderus* sp. though it is likely that these are *Graphoderus cinereus*; the other two species within the genera being Regionally Extinct, *G. bilineatus*, or Critically Endangered, *G. zonatus*).

Black Duck Marsh – west - sub-sample 4 (BDM-W-4):

Sub-sample 4 represented an end-of-ditch area of open water with submerged Small Pondweed *Potamogeton berchtoldii*, floating *Lemna minor* and *Lemna trisulca,* and marginal *Typha latifolia* providing relatively complex vegetative habitat.

Whilst surveying for aquatic macroinvertebrates both smooth newt *Lissotriton vulgaris* and 3-spined Stickleback *Gasterosteus aculeatus* were observed.

This submerged vegetative habitat supported six species of conservation interest; the Vulnerable *Graphoderus* (see note above), the Nationally Scarce water beetle *Haliplus apicalis* and four species with a Local distribution, two aquatic bugs and two aquatic snails. *Haliplus apicalis* is known to favour brackish water.

Black Duck Marsh – west - sub-sample 5 (BDM-W-5):

This sub-sample represented an area of floating grass with isolated sections of shallow surface water running alongside the southern-most ditch.

This floating grass habitat supported four species of conservation interest; the Near Threatened Great Silver Diving Beetle *Hydrophilus piceus*, the Nationally Scarce crawling water beetle *Peltodytes caesus* and two further water beetles with a Local distribution. Water beetles were by far the most abundant order in this habitat.

Black Duck Marsh – west - sub-sample 6 (BDM-W-6):

BDM-W-6 was taken from the main ditch running along the northern margin of the marsh; this ditch was substantially wider and deeper than adjoining ditches. Marginal vegetation was dominated by *Phragmites* and their stems and debris provided the principal vegetative habitat for aquatic fauna.

Whilst surveying for aquatic macroinvertebrates smooth newt *Lissotriton vulgaris* were recorded. Dense zooplankton assemblages (principally Daphniidae) were observed in the water column at the time of sampling.

A total of five species of conservation interest were recorded in this deep ditch section; the Vulnerable diving beetle *Graphoderus*, the Nationally Scarce diving beetle *Rhantus frontalis* and three species with a Local distribution, one water beetle and two aquatic bugs.

Black Duck Marsh – west – synopsis:

The faunal assemblages recorded in BDM-W typically reflected the variety of mesohabitats available from deep open ditches to muddy flooded grassland; grassy margins to dense fringing reedbeds. Several species typically favouring or confined to brackish water were recorded.

Water beetles and aquatic bugs were the most speciose taxonomic groups recorded in BDM-W, with 24 and 15 species, respectively. This richness is likely to reflect the vegetative habitat variability.

The CCI index categorised this marsh as Very High conservation value. A total of 67 species were recorded amongst almost 9,000 individuals, with the most abundant taxon, the Chironomidae, accounting for approximately one third of this total.

5.2.2.2 Black Duck Marsh – north

BDM-N comprised a series of interconnected ditches and a small area of wetland separated by flooded *Phragmites* (see sketch map, Appendix 2). At the time of sampling the water was similarly brackish across the various waterbodies (3360 – 3315 µS cm^{-1}) and largely neutral.

Black Duck Marsh – north - sub-sample 1 (BDM-N-1):

BDM-N-1 was taken from an area of open water to the north of the northern peripheral ditch (ditch D4); separated from the ditch by an area of emergent *Phragmites*. Margins were principally Sea Club-rush *Bolboschoenus maritumus* whilst the open water habitat was dominated by *Lemna trisulca.*

Numerous Blue-tailed Damselflies *Ischnura elegans* were observed flying around this area of wetland and their larvae were abundant in the waterbody. Whilst surveying for aquatic macroinvertebrates 22 newt larvae *Lissotriton vulgaris / L. helveticus* and 56 eggs were recorded.

A total of 11 species of conservation interest were recorded in BDM-N-1; the Vulnerable diving beetle *Graphoderus*, the Nationally Scarce water beetles *Ochthebius viridus* and *Enochrus halophilus* and the soldierfly *Stratiomys singularior* (the Flecked General), in addition to seven species with a Local distribution (two mayflies, two water beetles, one aquatic bug, one meniscus midge and one soldierfly).

E. halophilus and *S. singularior* are both listed in the Kent Rare and Scarce Species Inventory. The latter species is known to favour brackish coastal marshes supporting sea club-rush, as was observed here.

This patch of open marsh supported 19 species of water beetle.

Black Duck Marsh – north - sub-sample 2 (BDM-N-2):

Sub-sample BDM-N-2 was taken from various sections of marginal habitat along the northern two-thirds of ditch D8 (until scrub encroachment prevented further southerly travel along the ditch by canoe). This section of ditch was deep open water with marginal *Phragmites* and waterlogged scrub hedge (this was in poor condition). Floating green algae (including *Spirogyra*), *L. minor* and *L. trisulca* were evident amongst marginal stems.

Whilst surveying for aquatic macroinvertebrates 54 newt larvae *Lissotriton vulgaris / L. helveticus* and 11 eggs were recorded.

This marginal ditch habitat supported seven species of conservation interest; the Near Threatened water beetle *Hydrochus ignicollis*, the Nationally Scarce diving beetle *Rhantus frontalis*, the whirligig beetle *Gyrinus paykulli* and the crawling water beetle *Peltodytes caesus*, in addition to three species of Local distribution (one mayfly and two water beetles).

By far the most abundant species recorded here was the ubiquitous Wandering Pond Snail *Radix balthica.*

Black Duck Marsh – north - sub-sample 3 (BDM-N-3):

This sub-sample was taken amongst the marginal habitats of the northerly section of ditch D9 (scrub encroachment prevented canoe travel along a large part of this ditch). Margins were dominated by overhanging brambles and branches from bankside scrub; floating *L. minor* and *L. triscula* had accumulated in the margins amongst wind blown pollen and leaf litter detritus.

Whilst surveying for aquatic macroinvertebrates a single newt larva *Lissotriton vulgaris / L. helveticus* was recorded.

Within this section of ditch, three species with a Local distribution were recorded; one caddisfly and two aquatic bugs.

Black Duck Marsh – north – synopsis:

BDM-N supported 24 species of water beetle; though the section of open marsh (BDM-N-1) provided much of this variety. The sections of deep open ditch margins contained several species confined to permanent waterbodies, in contrast to the faunal assemblages observed in parts of the peninsula subject to seasonal desiccation.

As found elsewhere on the peninsula, several species recorded in BDM-N are known to tolerate or are confined to brackish coastal aquatic habitats.

This marsh area supported several species of conservation interest and three listed in the Kent Rare and Scarce Species Inventory (Table 11). The CCI index indicated the area to be of Very High conservation value (with the highest CCI score recorded in the survey).

A total of 61 species amongst approximately 10,000 individuals were recorded in this area. The most abundant species, the Wandering Pond Snail *Radix balthica*, accounted for approximately one half of this total number of individuals. A substantial proportion of these individuals were however newly hatched juveniles.

5.2.3 Swanscombe Marsh ponds

5.2.3.1 Pond P3

Pond P3 is situated in the centre of the peninsula; this waterbody exhibited substantial quantities of lime-like precipitated material both on its bed and on the submerged stems of marginal *Phragmites*. In addition to the encrusting precipitate, orange-brown seepages were evident on the western bed and banks; black staining was evident on the substratum on the eastern section of the pond. No chemical data for this waterbody was available to the author at the time of writing.

At the time of the survey the water was both brackish (3815 μS cm^{-1}) and notably alkaline (pH 8.6).

No aquatic vegetation was observed either submerged or floating. Margins were principally *Phragmites* with occasional Bittersweet *Solanum dolcamara*. Marginal *Phragmites* on the western bank was typically patchy and where emergent in the pond was in poor condition and heavily encrusted with precipitate. Stems of emergent *Phragmites* along the eastern bank exhibited less precipitate (see sketch map, Appendix 2).

Pond P3 - sub-sample 1 (P3-1):

This sub-sample was taken amongst the marginal *Phragmites* along the eastern bank of the pond. This fringing reed habitat supported two species with a Local distribution, one water beetle and one aquatic bug.

The water column contained a notably high density of zooplankton (principally Daphniidae).

Pond P3 - sub-sample 2 (P3-2):

Sub-sample P3-2 was taken amongst the heavily encrusted patches of marginal *Phragmites* and dead stems of emergent *Phragmites* along the western bank of the pond.

A total of two species with a Local distribution were recorded within this habitat; one whirligig beetle and one aquatic bug. Notably high densities of Chironomidae were recorded amongst and particularly within these encrusted *Phragmites* stems (in excess of 2,000 individuals).

P3 – synopsis:

A total of 21 species were recorded amongst in excess of 2,000 individuals; almost 90 % of which were one taxon, Chironomidae.

The CCI index categorised this pond as Fairly High conservation value; reflecting the presence of three species with a Local distribution amongst a relatively low number of species. Using the Species Rarity Index, P3 was categorised as Moderate conservation value, on the basis of its faunal assemblage (low on the basis of its wetland plants).

PSYM analysis categorised P3 as Moderate ecological status (with an IBI of 56 %). The plant assemblage was notably lower in richness and rarity than predicted; the dragonfly and alderfly fauna were similarly less rich than predicted.

5.2.3.2 Pond P5

Pond P5 is located within the central peninsula. This pond, along with P6-N and P6-S, were created as mitigation for the impact of the construction of the Channel Tunnel Rail Link.

This pond is relatively small (approximately 900 m^2) and shallow with densely vegetated margins (see sketch map, Appendix 2). At the time of sampling the water in this pond was neutral and fresh; the lowest conductivity for the surveyed waterbodies on the peninsula (1005 μS cm^{-1}).

Both Blue-tailed Damselflies *Ischnura elegans* and Common Blue Damselflies *Enallagma cyathigerum* were observed flying around this pond.

Pond P5 - sub-sample 1 (P5-1):

P5 supported approximately 5 % submerged Common Stonewort *Chara vulgaris* and Lesser Pondweed *Potamogeton pusillus* within the central section of open water; the substratum was principally bare mud. Occasional patches of submerged filamentous algae (including *Spirogyra*) were evident within these open sections. Sub-sample P5-1 was taken amongst these open water habitats.

Whilst surveying for aquatic macroinvertebrates two 9-spined Sticklebacks *Pungitus pungitus* and two unidentified fry were recorded.

Within this submerged vegetative habitat four species of conservation interest were recorded; the Nationally Scarce crawling water beetle *Peltodytes caesus*, and three species with a Local distribution, one dragonfly, one water beetle and one aquatic bug (Table 9).

Notably high abundances of aquatic bug nymphs (from the family Corixidae or water boatmen) were observed amongst this submerged vegetation.

Pond P5 - sub-sample 2 (P5-2):

Marginal vegetative habitats were dominated by emergent *Typha latifolia*, *Phragmites australis* and rush *Juncus* sp. Sub-sample P5-2 was taken amongst these typically densely vegetated margins (generally in excess of 80 % cover).

Whilst surveying for aquatic macroinvertebrates one 3-spined Stickleback *Gasterosteus aculeatus* and seven unidentified fry were recorded; as were two newt larvae *Lissotriton vulgaris / L. helveticus*.

A total of nine species of conservation interest were recorded within this marginal habitat; the Near Threatened Great Silver Diving Beetle *Hydrophilus piceus*, the Nationally Scarce water beetles *Peltodytes caesus, Helophorus alternans* and *Ochthebius viridus*, and five species with a Local distribution (one dragonfly, two water beetles, one aquatic bug and one soldierfly).

The faunal assemblage largely reflected the habitat structure available i.e. the Water Stick Insect *Ranatra linearis* and the Common Green Colonel soldierfly *Oplodontha viridula* (both Local species) both typically favouring to live amongst marginal emergent vegetation.

P5 – synopsis:

This pond supported a relatively rich water beetle and aquatic bug assemblage (17 and 12 species, respectively). In total, 50 species were recorded amongst approximately 3,000 individuals. Both the CCI index and the SRI categorised P5 as Very High conservation value.

PSYM analysis indicated this pond to be of Good ecological status, with and IBI of 83 %. Aquatic macroinvertebrate metrics exceeded those predicted; however wetland plant richness and rarity were notably lower than predicted, for a pristine site (Table 15).

This waterbody met more than one of the criteria necessary for it to be defined as a UK BAP Priority Pond (Table 5); with species richness of 50, the presence of sufficient species of high conservation value (this pond supported one Near Threatened and three Nationally Scarce species) and a PSYM IBI greater than 75 %.

5.2.3.3 Pond P6 – north

P6 was located within a wider area of reedbed. The pond supported dense marginal vegetation, principally *Phragmites* with *Bolboschoenus maritumus, Typha latifolia* and Common Spike-rush *Eleocharis*

palustris. Open water habitat comprised approximately 50 % cover submerged and floating *Potamogeton pusillus* with occasional *Chara vulgaris* and filamentous green algae (see sketch map, Appendix 2).

The substratum of the pond was largely soft clay and the water depth was between 35 -100 cm. At the time of sampling the water was fairly turbid, neutral and brackish (2140 μS cm^{-1}).

Whilst surveying for aquatic macroinvertebrates both smooth newt *Lissotriton vulgaris* and 3-spined Stickleback *Gasterosteus aculeatus* were observed in the pond.

Pond P6-N - sub-sample 1 (P6-N-1):

Sub-sample P6-N-1 was taken amongst the submerged vegetative habitats within the open water.

This habitat supported four species with a Local distribution within the UK; two water beetles and two aquatic bugs. These two water beetle species, *Berosus affinis* and *Berosus signaticollis*, both typically favour aquatic habitats with at least some exposed substratum amongst submerged vegetation, as observed here.

Pond P6-N - sub-sample 2 (P6-N-2):

Sub-sample P6-N-2 was taken amongst the marginal and emergent *Bolboschoenus maritimus*.

A total of 11 species of conservation interest were recorded amongst this marginal habitat; the Nationally Scarce crawling water beetle *Peltodytes caesus*, and 10 Local species, one dragonfly, one water beetle, seven aquatic bugs and one aquatic snail.

In addition to the above species, the Nationally Scarce ground beetle *Demetrias imperialis*, was recorded here (listed in the Essex Red Data List). This terrestrial species typically lives amongst riparian emergent vegetation.

Pond P6-N - sub-sample 3 (P6-N-3):

This sub-sample was taken amongst the marginal and emergent *Phragmites australis*.

This marginal habitat supported six species with a Local distribution; one mayfly, two water beetles and three aquatic bugs. The aquatic bugs were the most speciose order recorded in this habitat, with 11 species observed.

P6 – N – synopsis:

The aquatic bugs and water beetles were the most species rich orders recorded in P6 (18 and 17 species, respectively). This reflected the relative variability in vegetative habitats within the pond. In total 67 species were recorded, amongst approximately 4,500 individuals. No one species accounted for more than one quarter of this total.

Both the CCI index and the SRI categorised this pond as Very High conservation value. This waterbody met the criteria necessary for it to be defined as a UK BAP Priority Pond; as it was found to support in excess of 50 species.

PSYM analysis further supported P6-N status as a Priority Pond. P6-N was categorised as having Good ecological status with an IBI of 89 %. Nevertheless the species-richness of the aquatic and wetland plant assemblage was substantially less than predicted; all other metrics approximated or exceeded predicted values.

5.2.3.4 Pond P6 – south

Pond P6-S was a large elliptical pond (approximately 10,000 m^2) adjacent to the Channel Tunnel Rail Link compound, separated from P6-N principally by *Phragmites* and *Salix*.

Unlike P6-N however, the water at the time of sampling in P6-S was fresh (1042 µS cm^{-1}) and neutral.

The south-western margin of the pond was dominated by *Phragmites* with occasional *Typha latifolia*. The north-eastern margin was typically more diverse with patches of both *T. latifolia* and Lesser Reedmace *Typha angustifolia*, *Eleocharis palustris*, Water-plantain *Alisma plantago-aquatica*, Grey Club-rush *Schoenoplectus tabermaemontani*, Hard Rush *Juncus inflexus*, Jointed Rush *Juncus articulatus* and False Fox-sedge *Carex otrubae*.

The open water was dominated by Small Pondweed *Potamogeton berchtoldii*, with patches of Water Starwort *Callitriche* sp. and *Ranunculus baudotii,* particularly in the south-eastern section of the pond (see sketch map, Appendix 2).

Whilst surveying for aquatic macroinvertebrates smooth newt *Lissotriton vulgaris,* 3- and 9-spined Sticklebacks, *Gasterosteus aculeatus* and *Pungitius pungitius* and unidentified fry were observed in the pond.

Pond P6-S - sub-sample 1 (P6-S-1):

Sub-sample P6-S-1 was taken amongst the dense stands of *T. latifolia* and *T. angustifolia*.

These *Typha* stands supported four species of aquatic bug with a Local distribution; aquatic bugs were the most species-rich order in this habitat.

Pond P6-S - sub-sample 2 (P6-S-2):

This sub-sample was taken amongst the submerged *Potamogeton berchtoldii* at various locations within the open water.

A total of three species of conservation interest were recorded amongst this submerged vegetation; the Nationally Scarce water beetle *Helophorus alternans* and two Local species of aquatic bug. One of these species of aquatic bug, *Cymatia coleoptrata*, is known to favour open-structured submerged vegetation; comparable to *P. berchtoldii* structure.

Pond P6-S - sub-sample 3 (P6-S-3):

Sub-sample P6-S-3 was taken amongst the patches of mixed-species submerged and floating vegetative habitat; *Callitriche* sp., *Potamogeton berchtoldii* and *Ranunculus baudotii*.

Amongst this mixed-species vegetative habitat seven species of conservation interest were recorded; the Nationally Scarce water beetle *Helophorus alternans*, and six species with a Local distribution; one mayfly, two water beetles, two aquatic bugs and one aquatic snail.

Aquatic bugs were both the most abundant and speciose order recorded from this habitat.

Pond P6-S - sub-sample 4 (P6-S-4):

The fourth sub-sample from Pond P6-S was taken amongst various sections of the marginal and emergent stands of *Phragmites australis*.

These reed margins supported four species with a Local distribution; one dragonfly, one water beetle and two aquatic bugs. One of these species, the Hairy Dragonfly, *Brachytron pratense*, as a nymph, favours waterbodies supporting extensive fringing emergent vegetation as found here.

P6 – S – synopsis:

Within this pond a total of 65 species amongst in excess of 6,000 individuals were recorded; the most abundant taxon (the Chironomidae) accounted for just over one quarter of this total.

The waterbody supported one Nationally Scarce species and several with a Local distribution. The CCI index categorised P6-S as High conservation value; whilst the SRI indicated this pond to be Very High value.

PSYM analysis categorised P6-S as Good ecological status with an IBI of 83 %. As in the other surveyed ponds on the peninsula the wetland plant assemblage was however, notably less species-rich than predicted (less than half of that predicted).

This pond can be defined as a UK BAP Priority Pond on the basis of the presence of such a rich faunal assemblage and a PSYM IBI greater than 75 %.

5.2.4 Swanscombe Marsh – synopsis

Swanscombe Marsh aquatic and wetland habitats supported several species of conservation interest; one Vulnerable, two Near Threatened, eight Nationally Scarce and 39 species with a Local distribution.

The marsh included three ponds of the quality necessary for UK BAP Priority Pond status.

The water beetle assemblage was notably more species-rich than any other order, with 54 species in total. The Species Quality Index (representing the average Species Quality Score assigned to water-beetle species) for the marsh was 3.1 (greater than 2.0 indicates a *good* wetland site). Aquatic bugs were the second most speciose order with 25 species amongst all the surveyed sites in the marsh combined.

The richness in water beetle and aquatic bug assemblages is likely to at least in part reflect the variability in vegetative habitat structure across the waterbodies within the marsh. The spatial and temporal salinity gradient and variability in water quantity observed across the site is reflected in the range of habitat preferences observed within the faunal assemblages.

5.3 Wider Swanscombe area

5.3.1 Ebbsfleet Stream

The Ebbsfleet Stream issues from springs close to Springhead Nursery and flows northwards towards Ebbsfleet International Station. The surveyed section of the Ebbsfleet corridor comprises sections of wet woodland and reedswamp through which the channel/s flow.

The Ebbsfleet corridor within the proposed development site lies within the Ebbsfleet Marshes, Northfleet Local Wildlife Site.

5.3.1.1 Ebbsfleet Stream Site 1

The most downstream site surveyed on the Ebbsfleet Stream (ES1) comprised an area of *Phragmites australis* reedbed through which the stream spread and flowed northwards. The site was adjacent to a sewage treatment works. Occasional patches of *Callitriche* sp. were observed amongst the *Phragmites* stands.

The water was neutral (pH 7.4) with a conductivity of approximately 800 µS cm^{-1}.

Whilst surveying for aquatic macroinvertebrates 3-spined Stickleback *Gasterosteus aculeatus* were observed.

The faunal assemblage reflected the habitat here; dense emergent vegetation with a deep litter layer with very little flow. Several species recorded are more typical of ponds and ditches than streams, e.g., the diving beetle *Ilybius ater* typically found in pond edges or the caddisfly *Glyphotaelius pellucidus* favouring ditches supporting accumulations of leaf litter.

A total of 29 species amongst approximately 1,500 individuals were recorded, with the most abundant taxon (the detritivorous Water Hog Louse *Asellus aquaticus*) accounting for approximately one third of these.

This stretch of stream supported two species with a Local distribution; one mayfly and one aquatic bug. The CCI index categorised this site as Moderate conservation value.

Biotic scores indicated fauna to have a similar tolerance to organic enrichment as would be expected if the habitat were undegraded. There were, however, substantially fewer BMWP scoring families present than predicted (Table 17). RIVPACS however typically over-predicts diversity in headwater streams and was designed to assess riffle and not ponded habitats; these factors should be borne in mind when interpreting these metrics.

5.3.1.2 Ebbsfleet Stream Site 2

The stream at Site 2 (ES2) spread amongst an area of wet woodland (Crack Willow *Salix fragilis*). In-channel vegetation included Fool's Watercress *Apium nodiflorum*, Watercress *Rorippa nasturtium-aquaticum*, *Callitriche* sp., and *Lemna minor*. Marginal species included Great Willowherb *Epilobium hirsutum* and Water Figwort *Scrophularia auriculata*.

The channel here was deep; the water was neutral with a conductivity of approximately 700 µS cm^{-1}.

An Azure Damselfly *Coenagrion puella* was observed flying around the stream here. Whilst surveying for aquatic macroinvertebrates 3-spined Stickleback *Gasterosteus aculeatus* were observed.

As found downstream of here, the faunal assemblage included species more typically associated with sluggish or still waterbodies than streams; reflecting the slow flow amongst densely vegetated habitats.

A total of 30 species amongst approximately 1,500 individuals were recorded, with no single taxon accounting for greater than 15 % of these.

This stretch of stream supported three species with a Local distribution; one mayfly and two water beetles. The CCI index categorised this stretch of stream as Moderate conservation value.

Biotic indices indicated the fauna to be of similar biological water quality, in terms of organic enrichment, to that predicted. As found downstream of here however, the site supported far fewer BMWP scoring families than predicted (approximately three-quarters of those predicted).

5.3.1.3 Ebbsfleet Stream Site 3

The most upstream site surveyed on the Ebbsfleet Stream was ES3 (less than 1.5 km from the source). Here the stream spread widely amongst wet *Salix* woodland. A deep litter layer was evident on the substratum.

Marginal vegetation included *Epilobium hirsutum*, Yellow Flag *Iris pseudacorus*, Gypsywort *Lycopus europaeus* and *Solanum dolcamara*. In channel vegetation was principally *Rorippa nasturtium-aquaticum* with occasional *Callitriche* sp.. Bankside species included the invasive non-native Giant Hogweed *Heracleum mantagazzianum*.

The water here was neutral with a conductivity of approximately 800 µS cm^{-1}.

Whilst surveying for aquatic macroinvertebrates numerous tadpoles were observed in the shallow marginal areas; one 3-spined and 18 9-spined Stickleback, *Gasterosteus aculeatus* and *Pungitius pungitius,* and 29 unidentified fry were also recorded here.

This stretch of stream supported four species of conservation interest; the Nationally Scarce water beetle *Helophorus alternans*, and three species with a Local distribution, one aquatic bug, and two soldierflies. The water beetle *H.alternans* and one of these soldierflies (the Four-barred Major *Oxycera rara*) are both listed in the Essex Red Data List.

As found downstream, the faunal assemblage reflected the low flow and widespread densely vegetated margins. The soldierflies, the Four-barred Major *Oxycera rara* and the Delicate Soldier *Oxycera nigricornis*, are both typically associated with springs, pond margins and pools on either wet mud or lush vegetation, respectively; both habitats in abundance in this stretch of stream.

The CCI index categorised this site as High conservation value. A total of 40 species, the highest richness value for the surveyed stretches on the stream, amongst 2,700 individuals, were recorded here. The most abundant taxon, the Chironomidae, accounted for approximately 80 % of this total (Table 13).

As found elsewhere on the Ebbsfleet Stream, biotic indices indicated the fauna to be of similar biological water quality, in terms of organic enrichment, to that predicted. The number of BMWP scoring families were however less than predicted (approximately 80 % of those predicted).

5.3.1.4 Ebbsfleet Stream – synopsis

The Ebbsfleet stream corridor was typically well-vegetated with little or no flow; the faunal assemblage reflected this, with numerous species recorded more typical of ponds and ditches than flowing waterbodies.

A total of 64 species were recorded from the Ebbsfleet Stream sites; amongst these one was Nationally Scarce and six species had a Local distribution. Metrics indicated the sites to range between Moderate and High conservation value.

5.3.2 Wider Swanscombe area ponds

5.3.2.1 Bamber Pit Pond

Bamber Pit Pond is within a disused chalk pit; it is a large pond (approximately 18,000 m^2) with generally steep sides supporting little marginal and emergent vegetative habitat. Margins largely comprised overhanging amphibious *Salix*, Ivy *Hedera helix* and brambles *Rubus fruticosus* agg.; patches of emergent *Phragmites australis* and Water Mint *Mentha aquatica* provided valuable vegetative habitat. The open water was turbid at the time of sampling, with no visible submerged vegetation; occasional patches of White Water-lily *Nymphaea alba* provided floating habitat (see sketch map, Appendix 2).

The water was alkaline (pH 7.8) and fresh (983 $\mu S\ cm^{-1}$) at the time of surveying.

Large numbers of Common Blue Damselflies *Enallagma cyathigerum* were observed flying over the pond and its margins. Tadpoles were observed in this pond, as were unidentified fish fry and smooth newt *Lissotriton vulgaris*.

Bamber Pit Pond - sub-sample 1 (BPP-1):

Sub-sample BPP-1 was taken amongst the patches of floating *Nymphaea alba* in the south-west of the pond.

Tadpoles were observed in this part of the pond. Numerous *Enallagma cyathigerum* were observed 'in tandem' on and over the lily pads; this damselfly species is often found in large eutrophic lakes.

This floating vegetative habitat supported three species with a Local distribution; one caddisfly, and two aquatic snails.

Bamber Pit Pond - sub-sample 2 (BPP-2):

Sub-sample BPP-2 was taken amongst the overhanging and trailing amphibious vegetation (principally *Salix*).

A single species of conservation interest was recorded amongst this limited marginal habitat; an aquatic bug with a Local distribution. This species, *Micronecta scholtzi*, typically favours waterbodies with a bare mineral substratum as found in Bamber Pit Pond.

Bamber Pit Pond - sub-sample 3 (BPP-3):

This sub-sample was taken amongst the emergent *Phragmites australis* in the east of the pond.

These *Phragmites* margins supported two species with a Local distribution; one aquatic bug and one meniscus midge.

Bamber Pit Pond - sub-sample 4 (BPP-4):

The fourth sub-sample in the pond was taken amongst the marginal *Mentha aquatica*.

Within the *Mentha aquatica* habitat, four species with a Local distribution were recorded; one mayfly, two water beetles and one aquatic bug. This habitat supported the most species-rich assemblage of the surveyed habitats in BPP; 34 species as compared to 13-14 species within the other sub-sampled habitats. It is likely that this relative richness reflected the complex structure provided by this vegetative habitat in comparison to other available habitats, in addition to the variability in water depth and substratum within these patches.

Bamber Pit Pond – synopsis:

Bamber Pit Pond supported 45 species amongst approximately 2,600 individuals. The most abundant taxon (the aquatic bug *Micronecta*) accounted for approximately one quarter of this total.

A total of eight species with a Local distribution were recorded in BPP. The CCI index categorised BPP as Fairly High conservation value whilst the SRI categorised it as being Moderate value (or Low value on the basis of wetland plants).

PSYM analysis categorised BPP as Moderate ecological quality (IBI 50 %). The species richness and rarity of the aquatic and wetland plant assemblage were notably less than predicted by the model for pristine waterbodies; the faunal assemblages were more similar to those predicted.

5.3.2.2 Balancing Pond

The balancing pond is a deep pond with steep sides particularly beneath the water line; emergent and marginal vegetation was restricted to a relatively narrow strip. Marginal species included *Phragmites australis, Typha latifolia, Iris pseudacorus* and *Epilobium hirsutum*. Sections of margin supported little or no emergent vegetation.

At the time of sampling the water was turbid (largely a result of phytoplankton in the water column) with no visible submerged vegetative habitat. Floating vegetation was limited to an isolated patch of *Nymphaea alba* (see sketch map, Appendix 2).

At the time of sampling the water was both neutral and fresh (760 $\mu S\ cm^{-1}$).

Whilst surveying for aquatic macroinvertebrates 3-spined Stickleback *Gasterosteus aculeatus* were observed.

Balancing Pond - sub-sample 1 (BP-1):

Sub-sample BP-1 was taken amongst the relatively dense emergent and marginal *Phragmites australis* and *Typha latifolia.*

These emergent marginals supported three species of conservation interest; one Nationally Scarce diving beetle *Agabus conspersus* and two species with a Local distribution, one water beetle and one aquatic snail.

More than one species more typically associated with brackish water than fresh were recorded here; however this pond is geographically close to brackish waterbodies.

Balancing Pond - sub-sample 2 (BP-2):

This sub-sample was taken amongst the floating *Nymphaea alba.*

A total of five species with a Local distribution were found associated with these lilies; two water beetles, one aquatic bug, one aquatic snail and one leech.

Balancing Pond - sub-sample 3 (BP-3):

The third sub-sample in the balancing pond was taken within the less densely vegetated sections of margin amongst emergent *Iris pseudacorus* and grassy sections of bank.

These marginal habitats supported six species with a Local distribution; one caddisfly, two water beetles, two aquatic bugs and one aquatic snail.

Balancing Pond – synopsis:

The aquatic fauna recorded in the Balancing Pond included species generally associated with a range of environmental conditions; including species tolerant of poor water quality (e.g., the crawling water beetle *Haliplus immaculatus*) and species tolerant of diminishing water levels (the caddisflies *Limnephilus centralis* and *Limnephilus marmoratus*). The pond also supported species more typically associated with flowing waterbodies such as the mayfly *Ephemera danica*; this waterbody is however hydrologically linked to the neighbouring Ebbsfleet Stream.

It is likely that this habitat experiences temporal variability in water quantity and quality; fluctuating water depths will spatially alter the meso-habitats available to fauna.

A total of 71 species were recorded amongst approximately 6,500 individuals; where the most abundant taxon (Chironomidae) accounted for approximately one third of this total. This pond supported one Nationally Scarce and eight Local species amongst all the surveyed habitats.

The CCI index categorised BP to be High conservation value, the SRI as Very High value. PSYM analysis indicated this pond to be of Moderate ecological quality (IBI 61 %). The species richness and rarity of the aquatic and wetland plant assemblage was notably less than predicted by the model; the metrics relating to the faunal assemblage were however similar to or greater than those predicted.

This pond can be defined as a UK BAP Priority Pond on the basis of the presence of its rich faunal assemblage.

5.3.3 Wider Swanscombe area – Ebbsfleet corridor – synopsis

When compared to the many brackish waterbodies on the peninsula, the surveyed waterbodies within the Ebbsfleet corridor and wider Swanscombe area were freshwater; the aquatic fauna generally reflected this with less species tolerant of brackish conditions recorded. A number of taxa more typically associated with brackish conditions were however recorded in this area; typically as low abundances of mobile taxa, likely to have travelled from suitable neighbouring

sites via green or wetland corridors. The faunal assemblage largely reflected the variability of still or slow-flowing habitats available within the various waterbodies.

In total, the surveyed waterbodies within this area supported 20 species of conservation interest; two Nationally Scarce water beetles and 18 species with a Local distribution.

Surveyed waterbodies were between Moderate and High conservation value. One of the ponds, Balancing Pond, achieved the quality of UK BAP Priority Pond status.

5.4 Relative conservation importance of study area

There are no published criteria upon which to base an evaluation of the conservation importance of the faunal assemblages of Swanscombe peninsula and neighbouring aquatic habitats. Nevertheless, on the basis of the following metrics a tentative category of County/Regional importance has been assigned to the marshes of the peninsula (waterbodies in the wider area were not included as findings have been compared to data from grazing marsh habitats in this assessment):

1. The presence of a species with Vulnerable status.
2. The presence of three species with Near Threatened status.
3. A total of 10 Nationally Scarce and 42 Local species.
4. An exceptionally rich aquatic macroinvertebrate assemblage; a total of 186 species recorded from surveyed sites on the peninsula.
5. A total of four ponds with UK BAP Priority Pond status.
6. Approximately two thirds of sites to be of Very High conservation value (using CCI).
7. A total of 19 species faithful to brackish grazing marshes.
8. Water Beetle Species Quality Index of 2.9 with a total of 65 species of water beetle recorded. Drake (2004) identified grazing marshes with similar SQI's being between County or Regional status.

County importance is defined as being of candidate SSSI standard; Regional as outstanding for the region. Within the local area, wetlands of both Regional (e.g., Wennington and Aveley Marshes, in Essex) and County or Local value (e.g., Dartford and Crayford Marshes, in Kent) were identified in Drake, 2004.

6 Conclusions and recommendations

6.1 The Swanscombe Peninsula

The Swanscombe peninsula, historically coastal grazing marsh, consists of the eastern Botany Marsh and the western Swanscombe Marsh. The surveyed section of Botany Marsh was un-grazed with widespread scrub and reedbed and patchy surface water. This comprised a network of ditches, typically brackish and dominated by reeds. These ditches supported several species of conservation interest and were categorised as being between Fairly High and Very High conservation value. The newly created pond in the east of the marsh had a sufficiently rich faunal assemblage to be categorised as a UK BAP Priority Pond.

Within Botany Marsh a total of 80 species of aquatic macroinvertebrate were recorded, eight of which were Threatened or Nationally Scarce status (and several with a Local distribution).

Swanscombe Marsh comprised a series of wetland areas amongst a network of interconnected ditches to the west and an area of reedbed, ditches and ponds to the east. These ponds were created as mitigation for the Channel Tunnel Rail Link. These waterbodies were generally, though not entirely, brackish; water levels were typically higher than in Botany Marsh to the east. The surveyed ditches in Swanscombe Marsh typically contained several species of conservation interest and as such could be considered as relatively high conservation value. The two wetland areas supported notably rich faunal assemblages with several species of conservation concern; both wetlands were categorised as Very High conservation value. Of the surveyed ponds, three were of the quality necessary for UK BAP Priority Pond status.

A total of 154 species of aquatic macroinvertebrate were recorded amongst Swanscombe Marsh waterbodies, 11 of which were Threatened or Nationally Scarce status (and numerous with a Local distribution).

Within the surveyed waterbodies on the peninsula the water beetle assemblage was typically the most species-rich order. The aquatic bugs were generally the second most speciose order. Both Botany Marsh and Swanscombe Marsh, on the basis of their water beetle assemblages, when compounding data from all surveyed waterbodies within each marsh, can be categorised as being Good wetland sites.

Despite a superficial uniformity in habitat structure available across the marshes (a dominance of reedbeds generally exhibiting limited structural complexity or 'tangledness' that is frequently associated with faunal richness), the composition and richness of the faunal assemblages typically reflected the spatial variability in vegetative habitat structure across the waterbodies within the peninsula, in addition to the spatial and temporal salinity gradient and variability in water quantity observed.

Aquatic species richness typically varies with seral[1] stage of a waterbody, with the open early and vegetation-choked latest stages generally having fewer species than mid stages. Nevertheless, uncommon species may be associated with any seral stage; wetland species replace open water species in swamp conditions of late stage waterbodies. Waterbodies in the peninsula, though often choked late seral stage (little evidence of grazing and or active management on the peninsula), exhibited a range of successional stages.

Surveyed ponds (excluding P3) typically supported substantially more species than National Pond Survey Ponds (ponds located in semi-natural areas). Many individual ditches however, were not

[1] A seral stage is a phase in the development of a climax community.

especially species rich; many with notably less species than the average for similar waterbodies within England and Wales. When considering each marsh in its entirety however, the species tally was exceptionally high.

Each wetland supported on average approximately one third of the total number of species recorded for all surveyed sites, individual ponds (excluding P3) an average of 29 %, while individual ditches an average 14 % of species. These differences largely reflected the differences in habitat variability amongst the waterbody types.

Water levels and salinities varied throughout the peninsula and observations indicated the current hydrological conditions varied from those in the past (*CBA observations from historical surveys*). At least part of the faunal assemblage observed may represent relict populations reflecting historical environmental conditions.

Most aquatic species require permanent water; aquatic species richness typically declines when water depth is shallower than 15 cm in brackish waterbodies, 30 cm in freshwater (Drake, 2004). Faunal richness in several ditches, particularly in Botany Marsh, was likely to be limited by water depth. Ephemeral waterbodies (a substantial part of the ditch network on Botany Marsh is likely to be ephemeral) typically support less species than permanent waterbodies, nevertheless frequently include uncommon species (Nicolet, 2004) and those whose life cycle and habits are specifically adapted to the transient nature of their habitat.

At the other end of the spectrum, flooding, particularly in summer, can be detrimental to aquatic and wetland fauna as decaying vegetation can lead to deoxygenation of the waterbody. Decaying grass in the western flooded field in Black Duck Marsh is likely to be limiting species richness.

Naturally brackish ditches support coastal species, often scarce due to the limited availability of brackish habitats nationally. Several uncommon species recorded in the current study are tolerant of or confined to brackish habitats and or show a high fidelity to coastal grazing marsh habitats.

Diffuse pollution across sections of the central peninsula, a legacy of historical industrial activities, was evident within a number of waterbodies, pond P3 in particular.

6.2 Wider Swanscombe area

Surveyed waterbodies within the wider Swanscombe area comprised the Ebbsfleet corridor; the Ebbsfleet Stream and its riparian margins, and two nearby ponds, one balancing pond and one within a disused chalk pit.

These waterbodies were freshwater in contrast to those on the peninsula and this is reflected in the faunal assemblages. The Ebbsfleet Stream was categorised as between Moderate and High conservation value; the stream (when considering all sites combined) supported approximately one third of the total number of species recorded in all waterbodies. Within surveyed waterbodies in this area, two species with Nationally Scarce status (and several with a Local distribution) were recorded. Of the two surveyed ponds, one achieved the quality of UK BAP Priority Pond status.

These waterbodies and adjacent riparian zone provide a partial green corridor, albeit an interrupted corridor, between farmland to the south and the peninsula to the north (from which it is separated by Northfleet Industrial Estate). The Ebbsfleet corridor lies within Ebbsfleet Marshes Local Wildlife Site. Options for the planned access road for the proposed development largely follow this corridor (including both ponds), impacting to a greater or lesser extent on the upper reaches of the Ebbsfleet Stream and adjacent riparian habitats.

6.3 Value of sites

A total of 199 species of aquatic macroinvertebrate were recorded amongst approximately 70,000 individuals in the current study. Amongst these, several species of conservation concern were recorded; one Vulnerable, three Near Threatened, 11 Nationally Scarce and 51 with a Local distribution within the UK. Of the wetland and aquatic plants recorded in and around the waterbodies eight had a Local distribution. A total of five ponds were of the quality necessary for UK BAP Priority Pond status.

Historically several aquatic macroinvertebrate species of conservation interest have been recorded within the locality (Kent and Medway Biological Records Centre and Essex Field Club County Records data). Several species recorded in the current study were listed in the Kent Rare and Scarce Species Inventory and or the Essex Red Data List.

There are no established methods to assign a relative conservation importance to wetland and or aquatic macroinvertebrate assemblages. Nevertheless, by comparing a combination of metrics to those published for similar habitats within the UK, both Botany and Swanscombe Marshes combined could tentatively be categorised as being at least of County value, if not Regional.

The waterbodies associated with the Swanscombe Peninsula and Ebbsfleet Corridor lie over an area of Cretaceous chalk (Seaford and Newhaven chalk formations) overlain by superficial alluvium deposits. The area is within Natural England Greater Thames Estuary and North Kent Plain Natural Areas. The Swanscombe Peninsula and Ebbsfleet Corridor support a number of BAP habitats; including reedbeds, wet woodland, ponds and coastal and floodplain grazing marsh.

The north Kent marshes have typically high conservation value with regards the aquatic fauna in the ditch systems, with grazing marshes defined as both Regional and County value. Coastal and floodplain grazing marsh has been identified as being a UK BAP Priority Habitat; the objectives of this plan include maintaining the quality and extent of this habitat. The Kent coastal and floodplain grazing marsh Habitat Action Plan identifies the loss of grazing marsh habitat through industrialisation and development as a key threat, particularly in the Greater Thames Estuary.

In the current survey, four species of water beetle recorded can be described as being virtually restricted to grazing marshes, unlikely to sustain populations outside of this environment (Drake, 2004). Grazing marshes when found in coastal areas, such as this, provide the brackish conditions favoured by many of the more uncommon taxa observed here; a total of 19 of the recorded species are defined as having a strong association with brackish grazing marshes. Little evidence of grazing management was however, observed within the surveyed sections of the peninsula (this was evident however in the non-surveyed western section of Botany Marsh).

The survey area is in close proximity to a number of areas of designated conservation interest. The Thames Estuary and Marshes Special Protection Area (SPA) and RAMSAR site is approximately 6 km to the east of the site; this is based largely on its wader and wildfowl populations. Approximately 1 km to the north-west, on the north side of the River Thames, West Thurrock Lagoon and Marshes SSSI supports wintering wildfowl and waders populations, intertidal mudflats and reedbeds.

Part of the survey area lies within the Ebbsfleet Marshes Local Wildlife Site which includes the Ebbsfleet Stream and its riparian habitats. The stream and its riparian corridor enhance the aesthetic and amenity value of the local area, as well supporting a relatively diverse aquatic faunal assemblage.

The survey area is however, isolated from nearby wetland habitats (such as the County value Dartford and Crayford Marshes to the west) by both industrial and residential areas to the west, south and east and the tidal River Thames to the north. As such the faunal assemblages of this and neighbouring wetland habitats are somewhat fragmented.

Nevertheless, proximity to species-rich habitats will influence the diversity of the study waterbodies. Likewise the diversity of these waterbodies could potentially act as a colonisation source for sites beyond its boundaries.

Networks of ponds, such as found on the Swanscombe peninsula, are particularly important for biodiversity in increasing the connectivity of freshwater habitats at the landscape level (or 'pondscape'). Aquatic and wetland invertebrates, amphibians and mammals utilise these networks of habitats and some indeed depend upon them. These survey ponds lie within an area containing a variety of other waterbodies thus enhancing the gamma (regional) diversity in addition to their individual value.

6.4 Impacts and recommendations

At the time of writing the footprint of the proposed development is yet to be finalised. It is likely however that substantial areas of aquatic and wetland habitat and associated biodiversity, on the Swanscombe peninsula and along the Ebbsfleet corridor, will lie within this footprint. As outlined above, the current survey findings indicated the Swanscombe Peninsula and Ebbsfleet corridor supported both habitats and species of conservation value.

A number of these potentially impacted waterbodies were established as mitigation for the Channel Tunnel Rail Link and as such represent compensation for previous habitat losses and fragmentation in the locality.

Given the uncertainty regarding the project footprint, a detailed description of likely impacts to the various waterbodies and wetlands and associated fauna has not been included in this report. Similarly no discussion of potential mitigation measures relating to specific lost or impacted habitats has been provided. Such issues are however discussed without reference to specific areas.

Any reduction in the interconnectedness of the waterbodies in the area (i.e. between Black Duck Marsh-west and Botany Marsh in the east) will reduce biodiversity on a landscape scale i.e. leading to isolated populations and pockets of habitat, further stressing an already fragmented population. Loss of individual waterbodies will mean the loss of diversity hotspots within this landscape.

Aquatic faunal diversity, in areas not directly affected by the proposed development, may be influenced by disruption elsewhere in the catchment and or locality, as adult stages of many species travel amongst both aquatic and terrestrial habitats. In addition, the hydrological connectivity amongst waterbodies (surface water and the porosity of the underlying chalk) ensures potential detrimental impacts could have a knock-on effect elsewhere within the drainage system.

If the loss of ponds of UK BAP Priority Pond status is unavoidable then a suitable level of compensation is appropriate i.e. '*there should be no net loss of sites, and in fact where significant impacts are predicted there will be an expectation that compensation will provide an enhanced habitat (in terms of quality or area) as compared with that to be lost'* (Fairclough and Nicolet, 2008). Pond HAP target 4 requires 'enhancement' to be demonstrated beyond the compensation appropriate for the loss of a BAP priority habitat.

If replacement waterbodies in otherwise unaffected neighbouring areas are to be constructed to mitigate loss of habitat, these should be undertaken prior to the loss of any existing waterbodies. If given sufficient time, this would potentially allow a degree of colonisation of these new sites from the existing drainage system. The stage of succession of any waterbody will affect its potential to be recreated. New waterbodies cannot however replace those at later seral stages. Attempts can be made to artificially 'age' these waterbodies e.g., through the translocation of vegetation, pond substratum, or water, but such methods have limited success. Attempts should be made to recreate the specific conditions favoured by any species of conservation concern.

Where waterbodies are to remain, wherever possible, measures could be taken to enhance their biodiversity i.e. through improving water quality or habitat diversity and or complexity. New potentially species rich waterbodies, other than those designed to compensate for losses, should be incorporated into a design to enhance the landscape diversity.

Habitat complexity can be increased for example, through the conversion of simple trapezoidal cross-sectional ditches (such as typically observed on Botany Marsh) to a more complex profile by cattle poaching the margins, or through the creation of a step in the bank profile beneath the water level; this increases the availability of shallow water habitat beneficial to aquatic macroinvertebrates.

The interconnectedness of a ditch network can potentially allow reconstructed or altered channels to be re-colonised from remaining unaffected sections supporting similar fauna if suitable habitat is provided. Those individuals from disrupted or removed sections will however be lost.

Building on wetland areas will impact on the hydrology of the waterbodies in terms of the frequency and magnitude of flood events, salinity levels and general drainage of water into the waterbodies. Runoff from man-made surfaces will potentially contain pollutants. Mitigation measures would need to be put in place if the water quality of the remaining aquatic habitats is not to deteriorate.

A further survey, undertaken in early spring to provide a more comprehensive assessment of the conservation value of the site, is recommended. This would be particularly valuable given the number of taxa at an insufficient stage of development to be specifically identified, in the current survey. Similarly, surveys of neighbouring wetland habitats would provide a valuable local perspective.

Whatever mitigation measures are planned a monitoring programme evaluating the rate and success of establishment of any new pond, ditch or wetland, or potential detrimental impacts on pre-existing waterbodies, with reference to baseline data, should be undertaken, along with contingency plans.

7 Glossary of abbreviations and terms used in text

ASPT	Average Score Per Taxon
BAP	Biodiversity Action Plan
BMWP	Biological Monitoring Working Party
CBA	Chris Blandford Associates
CCI	Community Conservation Index
CoS	Community Score
CS	Conservation Score
EQI	Ecological Quality Index
FBA	Freshwater Biological Association
GQA	General Quality Assessment
HAP	Habitat Action Plan
IBI	Index of Biological Integrity
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LWS	Local Wildlife Site
NPS	National Pond Survey
PSYM	Predictive SYstem for Multimetrics
RAMSAR	Wetlands of international importance designated under the Ramsar Convention
RDB	Red Data Book
RIVPACS	River InVertebrate Prediction and Classification System
SAC	Special Area of Conservation
SRI	Species Rarity Index
SSSI	Site of Special Scientific Interest
SQI	Species Quality Index
TRS	Trophic Ranking Score
WHPT	Whalley Hawkes Paisley Trigg

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9 Appendices

Appendix 1: Photographs

Waterbodies & wetlands on the Swanscombe peninsula; Botany Marsh ditches:

Photograph 1 Botany Marsh ditch 1 (BM1) showing marginal *Phragmites*.

Photograph 2 Botany Marsh ditch 1 (BM1) showing *Phragmites* choked channel.

Photograph 3 Botany Marsh ditch 2 (BM2); marginal and in-channel *Phragmites*.

Photograph 4 Botany Marsh ditch 3 (BM3) showing section of open water.

Photograph 5 *Ranunculus baudotii* in Botany Marsh ditch 3 (BM3).

Photograph 6 Botany Marsh ditch 4 (BM4); channel largely bare sediment.

Waterbodies & wetlands on the Swanscombe peninsula; Swanscombe Marsh ditches:

Photograph 7 Swanscombe Marsh ditch 1 (SM1); *Phragmites australis* indicates line of ditch margin.

Photograph 8 Deep open water between marginal *Phragmites* in Swanscombe Marsh ditch 1 (SM1).

Photograph 9 Swanscombe Marsh ditch 2 (SM2) showing marginal *Phragmites*.

Photograph 10 Swanscombe Marsh ditch 3 (SM3); open water persisted between *Phragmites*.

Photograph 11 Swanscombe Marsh ditch 4 (SM4); deep open water channel, little or no marginal vegetation.

Photograph 12 Swanscombe Marsh ditch 5 (SM5); *Phragmites* choked channel, water shallow and patchy amongst plant debris.

Waterbodies & wetlands on the Swanscombe peninsula; Black Duck Marsh west:

Photograph 13 Black Duck Marsh showing evidence of variable water levels in flooded western field.

Photograph 14 Black Duck Marsh west sample site 1 (BDM-W-1); flooded western field amongst *Juncus* and *Phragmites*.

Photograph 15 Line of flooded Ditch 5 between western and eastern fields in Black Duck Marsh.

Photograph 16 *Phragmites* fringe to flooded eastern field on Black Duck Marsh west (sample site BDM-W-2).

Photograph 17 Emergent *Phragmites* at sample site BDM-W-2.

Photograph 18 Open water habitat with isolated *Juncus* clumps in eastern field of Black Duck Marsh west (sample site BDM-W-3).

Photograph 19 Southern end of Ditch D4. Black Duck Marsh west sampling site 4 (BDM-W-4). Small Pondweed *Potamogeton berchtoldii* providing submerged vegetative habitat.

Photograph 20 Black Duck Marsh west sampling site 5 (BDM-W-5). Flooded and floating grass alongside ditch D3 (beneath brambles on right of photograph).

Photograph 21 *Phragmites* fringed open water habitat of Ditch D4 (sample site BDM-W-6).

Waterbodies & wetlands on the Swanscombe peninsula; Black Duck Marsh north:

Photograph 22 Black Duck Marsh north sample site 1 (BDM-N-1). Emergent *Bolbschoenus maritimus* with submerged/floating *Lemna trisulca.*

Photograph 23 Ditch D8 facing south; sample site Black Duck Marsh north 2 (BDM-N-2).

Photograph 24 Flooded hedge alongside ditch D8 in extremely poor condition.

Photograph 25 Floating and submerged algae amongst marginal *Phragmites* stems in Ditch D8.

Photograph 26 Black Duck Marsh sample site BDM-N-3 (Ditch D9). Open water channel is blocked by brambles and scrub in centre of photograph (facing south).

Photograph 27 Northern end of ditch D9; flotsam and *Lemna minor* in margins and ditch end amongst overhanging and trailing amphibious scrub.

Waterbodies & wetlands on the Swanscombe peninsula; Pond in Botany Marsh:

Photograph 28 New Pond Botany Marshes; turbid open water with patches of *Ranunculus baudotii*.

Photograph 29 *Phragmites* fringe along old ditch line entering New Pond from south (sample habitat 1). Extensive patch of *Ranunculus baudotii* in foreground of photograph (sample habitat 2).

Photograph 30 Ditch outfall from New Pond.

Waterbodies & wetlands on the Swanscombe peninsula; Ponds in Swanscombe Marsh:

Photograph 31 Western margin of pond P3 showing patchy *Phragmites* fringe in poor condition. Note orange discolouration of water.

Photograph 32 Detail of remains of *Phragmites* fringe on western bank of pond P3 showing extensive precipitate on submerged stem fragments.

Photograph 33 Looking towards 'relatively healthy' eastern *Phragmites* fringe to pond P3. Note no submerged vegetation was evident in pond.

Photograph 34 Pond P5 showing extensive marginal vegetation habitats.

Photograph 35 Open water habitat supporting extensive submerged *Chara vulgaris* and *Potamogeton pusillis* in pond P6-N (sample habitat 1).

Photograph 36 Marginal vegetation in pond P6-N (sample habitat 2).

Photograph 37 *Phragmites* fringed south-west bank of pond P6-S. Extensive patches of submerged *Potamogeton berchtoldii* and submerged/floating *Callitriche* pondwards from margin.

Photograph 38 Flowering *Potamogeton berchtoldii* in pond P6-S.

Photograph 39 Marginal vegetative habitats in the north-western end of pond P6-S.

Waterbodies to the south of the Swanscombe peninsula; ponds:

Photograph 40 Bamber Pit Pond.

Photograph 41 Common Blue Damselfly *Enallagma cyathigerum* mating on waterlilies in Bamber Pit Pond.

Photograph 42 Amphibious overhanging marginal scrub provides limited marginal habitat in Bamber Pit Pond.

Waterbodies to the south of the Swanscombe peninsula; ponds and Ebbsfleet Stream:

Photograph 43 Balancing Pond (looking along the north-western margin). Note turbid water supporting no submerged vegetation.

Photograph 44 South-eastern margin of Balancing Pond.

Photograph 45 Ebbsfleet Stream Site 1; the stream flows through an extensive area of *Phragmites*.

Waterbodies to the south of the Swanscombe peninsula; Ebbsfleet Stream:

Photograph 46 Ebbsfleet Stream Site 2; deep turbid water amongst *Salix* scrub.

Photograph 47 Ebbsfleet Stream Site 3; the stream flows through a section of flooded woodland with extensive *Rorippa nasturtum-aquaticum* vegetative habitat.

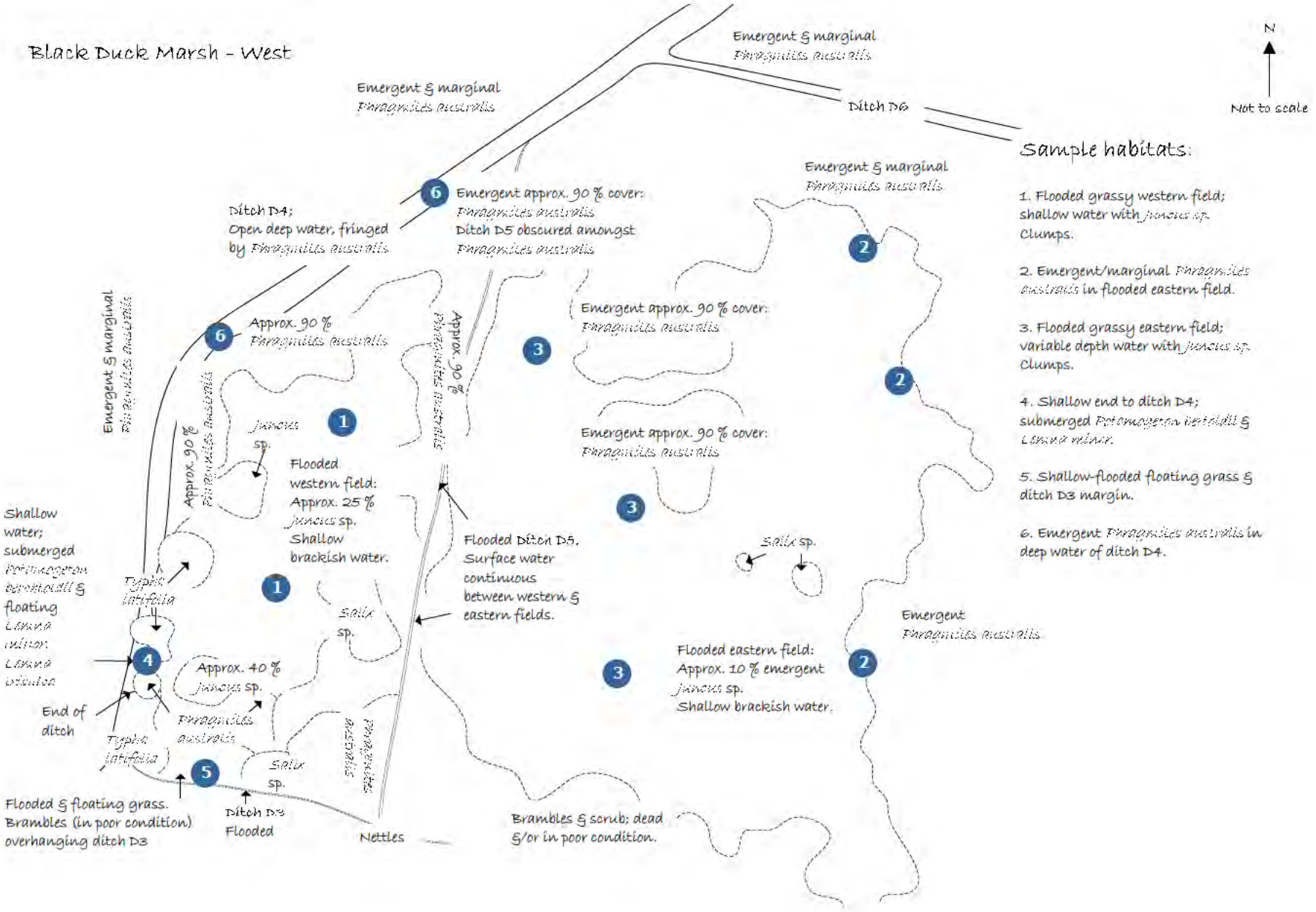
Photograph 48 Ebbsfleet Stream Site 3 showing sections of clear, shallow shaded, open water amongst extensive emergent vegetation.

Appendix 2: Sketch maps of wetlands and ponds

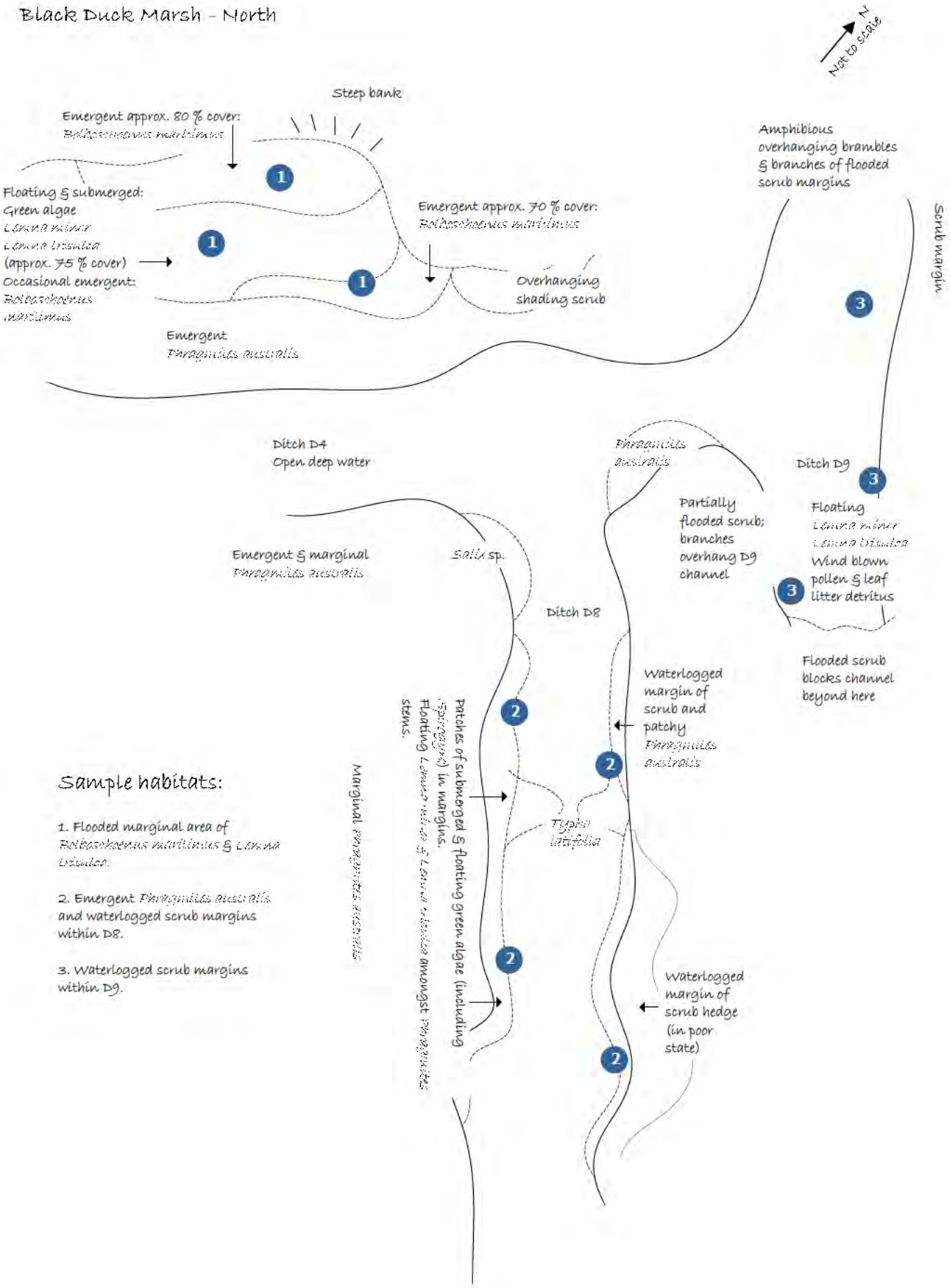
The following maps illustrate the approximate extent and distribution of vegetative habitats within the various wetlands and ponds surveyed.

Maps are not to scale.

Filled blue circles indicate approximate location of sample stations.


Black Duck Marsh - West
N
Not to scale
Emergent & marginal
Phragmites australis
Ditch D6
Sample habitats:
1. Flooded grassy western field; shallow water with Juncus sp. Clumps.
2. Emergent/marginal Phragmites australis in flooded eastern field.
3. Flooded grassy eastern field; variable depth water with Juncus sp. Clumps.
4. Shallow end to ditch D4; submerged Potamogeton berchtoldii & Lemna minor.
5. Shallow-flooded floating grass & ditch D3 margin.
6. Emergent Phragmites australis in deep water of ditch D4.
Ditch D4; Open deep water, fringed by Phragmites australis
Emergent approx. 90 % cover: Phragmites australis Ditch D5 obscured amongst Phragmites australis
Approx. 90 % Phragmites australis
Juncus sp.
Flooded western field: Approx. 25 % Juncus sp. Shallow brackish water.
Flooded Ditch D5. Surface water continuous between western & eastern fields.
Emergent approx. 90 % cover: Phragmites australis
Salix sp.
Shallow water; submerged Potamogeton berchtoldii & floating Lemna minor, Lemna trisulca
Typha latifolia
Salix sp.
Approx. 40 % Juncus sp.
End of ditch
Phragmites australis
Typha latifolia
Salix sp.
Flooded & floating grass. Brambles (in poor condition) overhanging ditch D3
Ditch D3 Flooded
Nettles
Brambles & scrub; dead &/or in poor condition.
Flooded eastern field: Approx. 10 % emergent Juncus sp. Shallow brackish water.
Emergent Phragmites australis

Black Duck Marsh - North



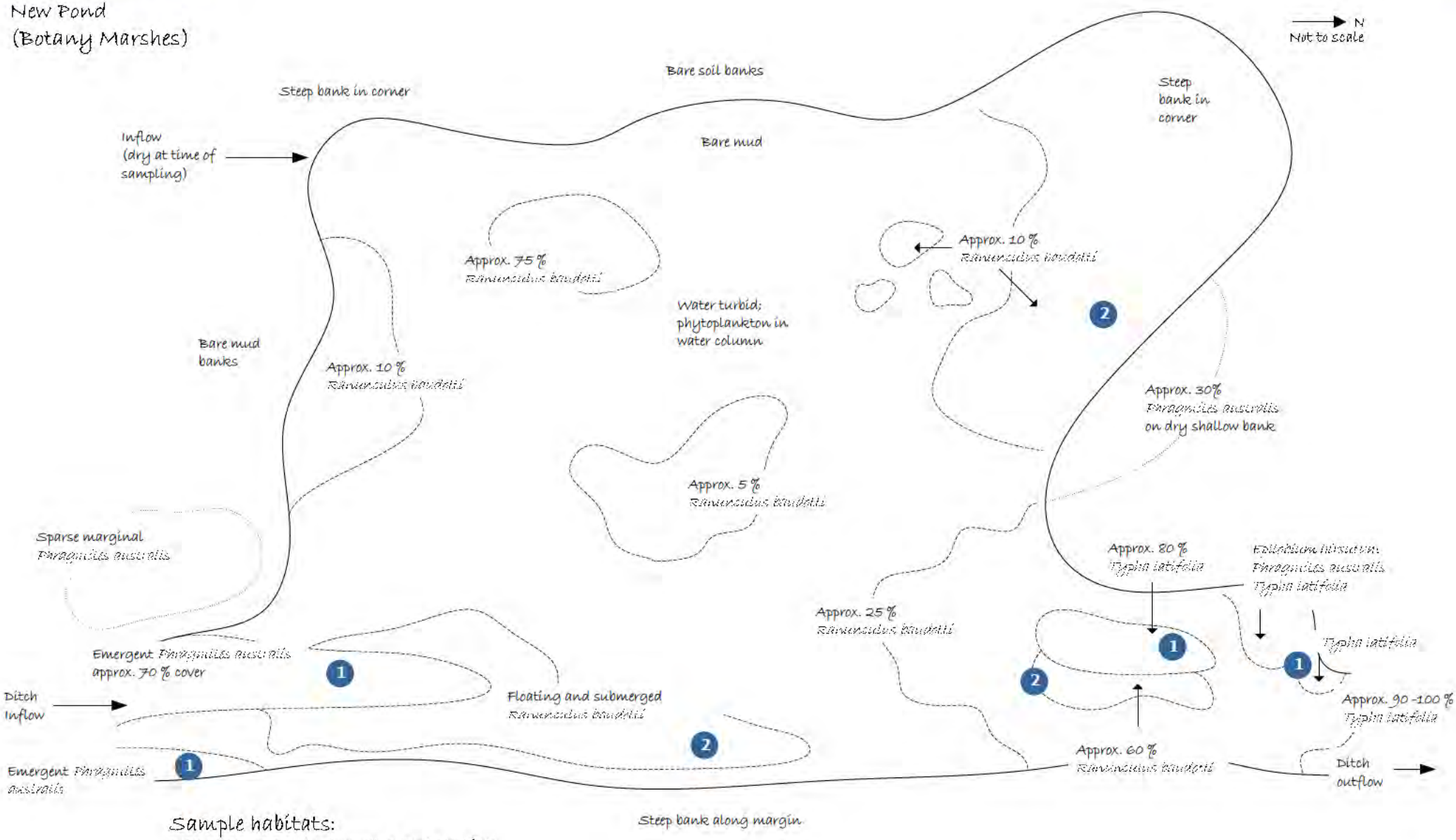
Sample habitats:

1. Flooded marginal area of *Bolboschoenus maritimus* & *Lemna trisulca*.

2. Emergent *Phragmites australis* and waterlogged scrub margins within D8.

3. Waterlogged scrub margins within D9.

New Pond
(Botany Marshes)

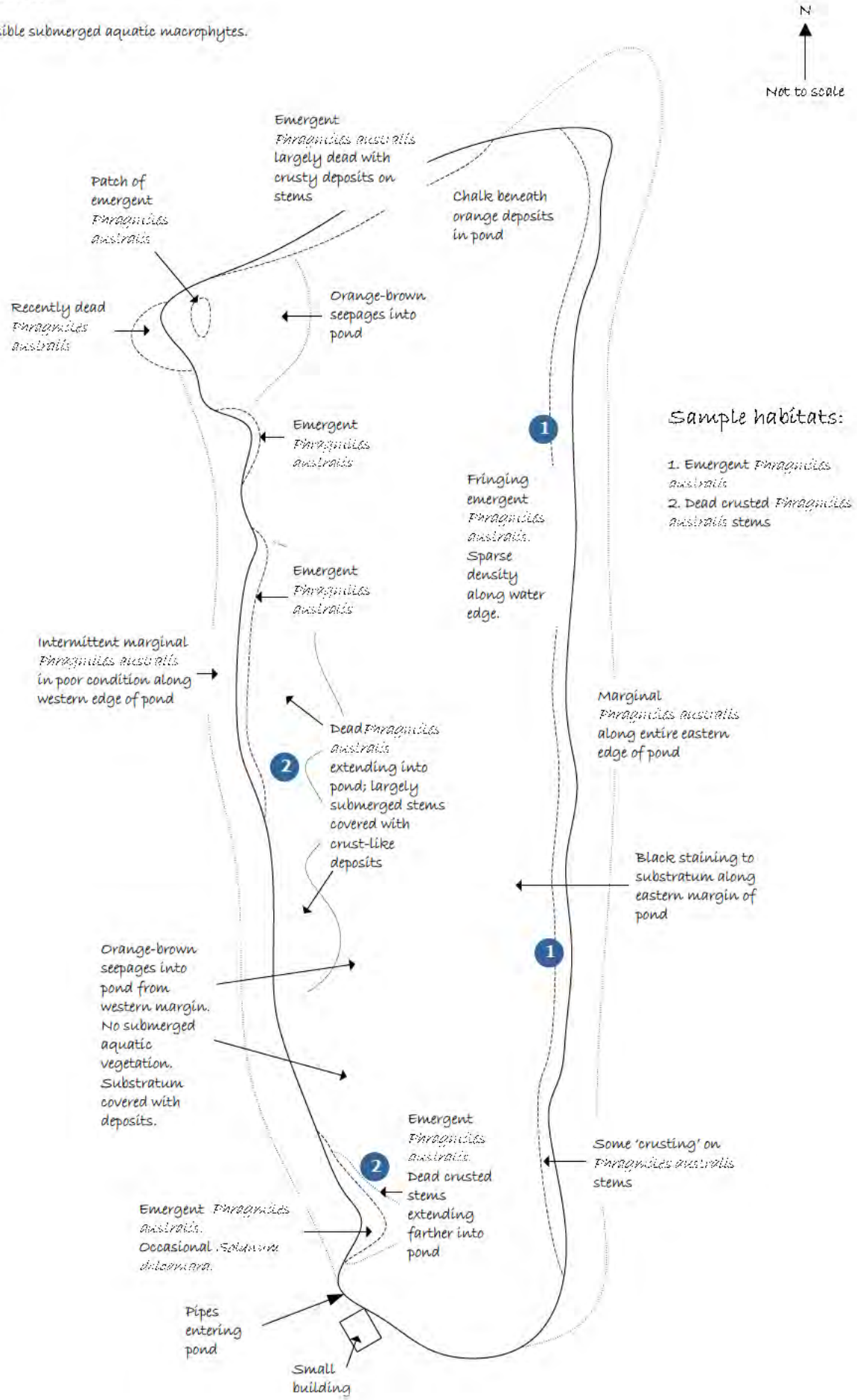


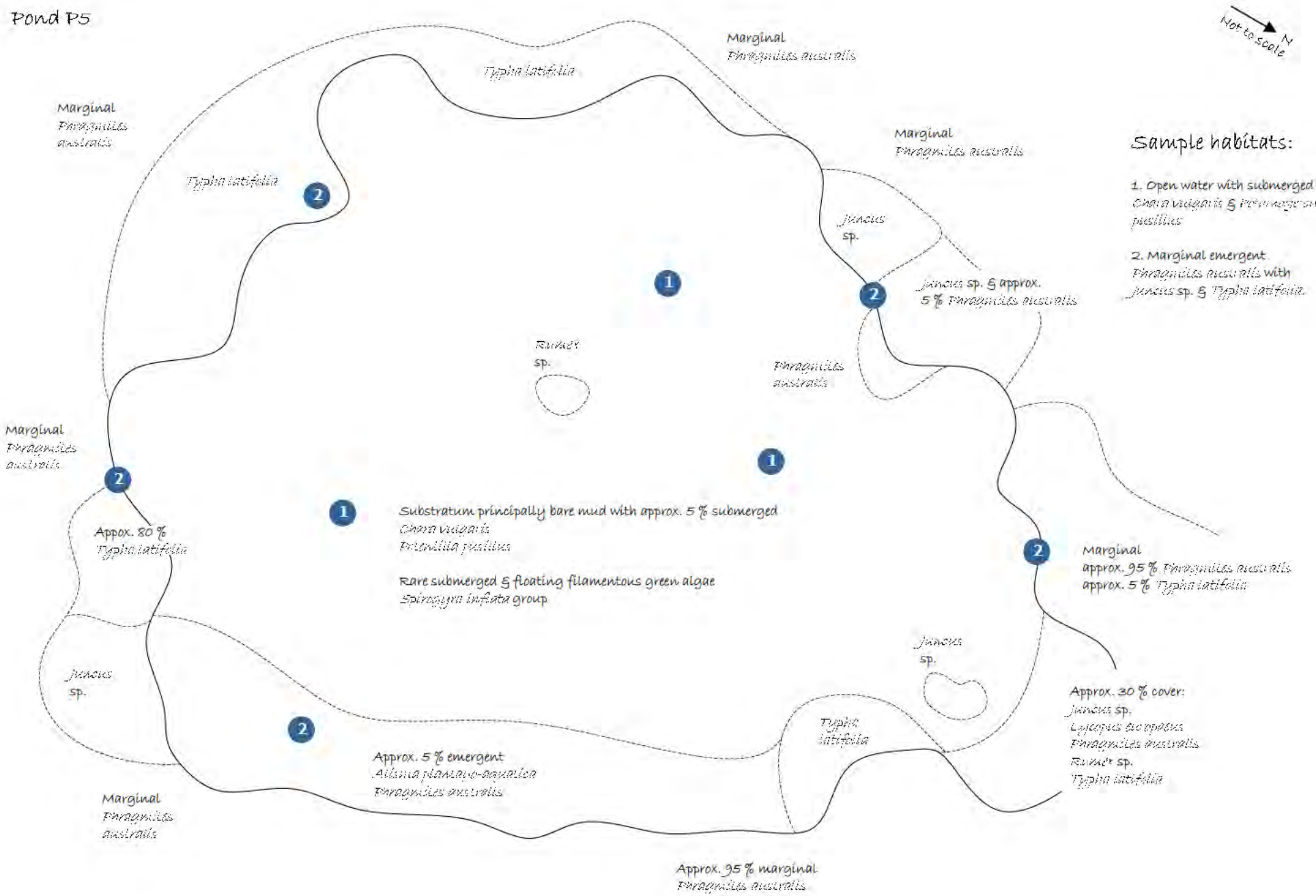
Sample habitats:

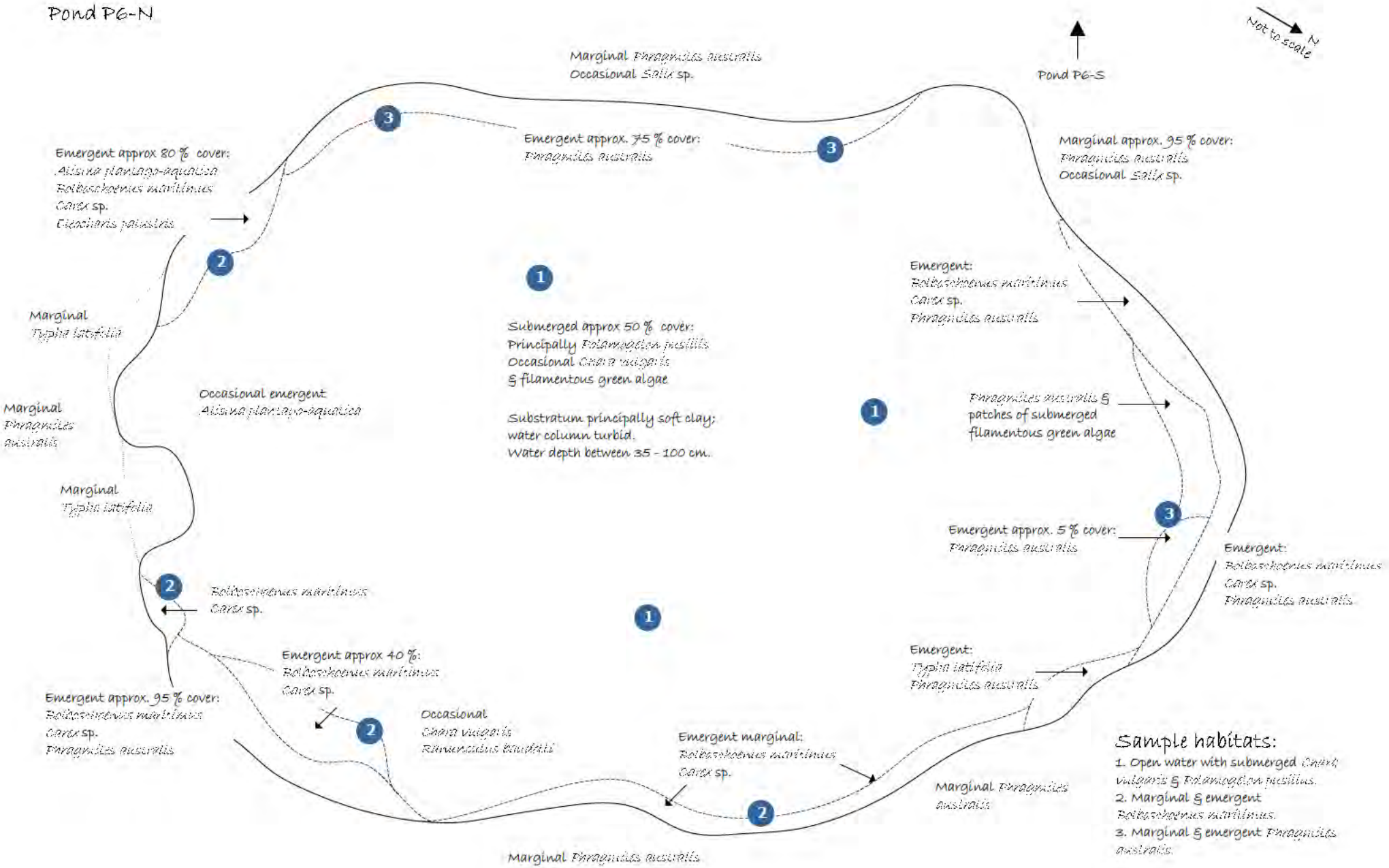
1. Emergent *Phragmites australis* & *Typha latifolia*
2. Floating and submerged *Ranunculus baudotii*

Pond P3

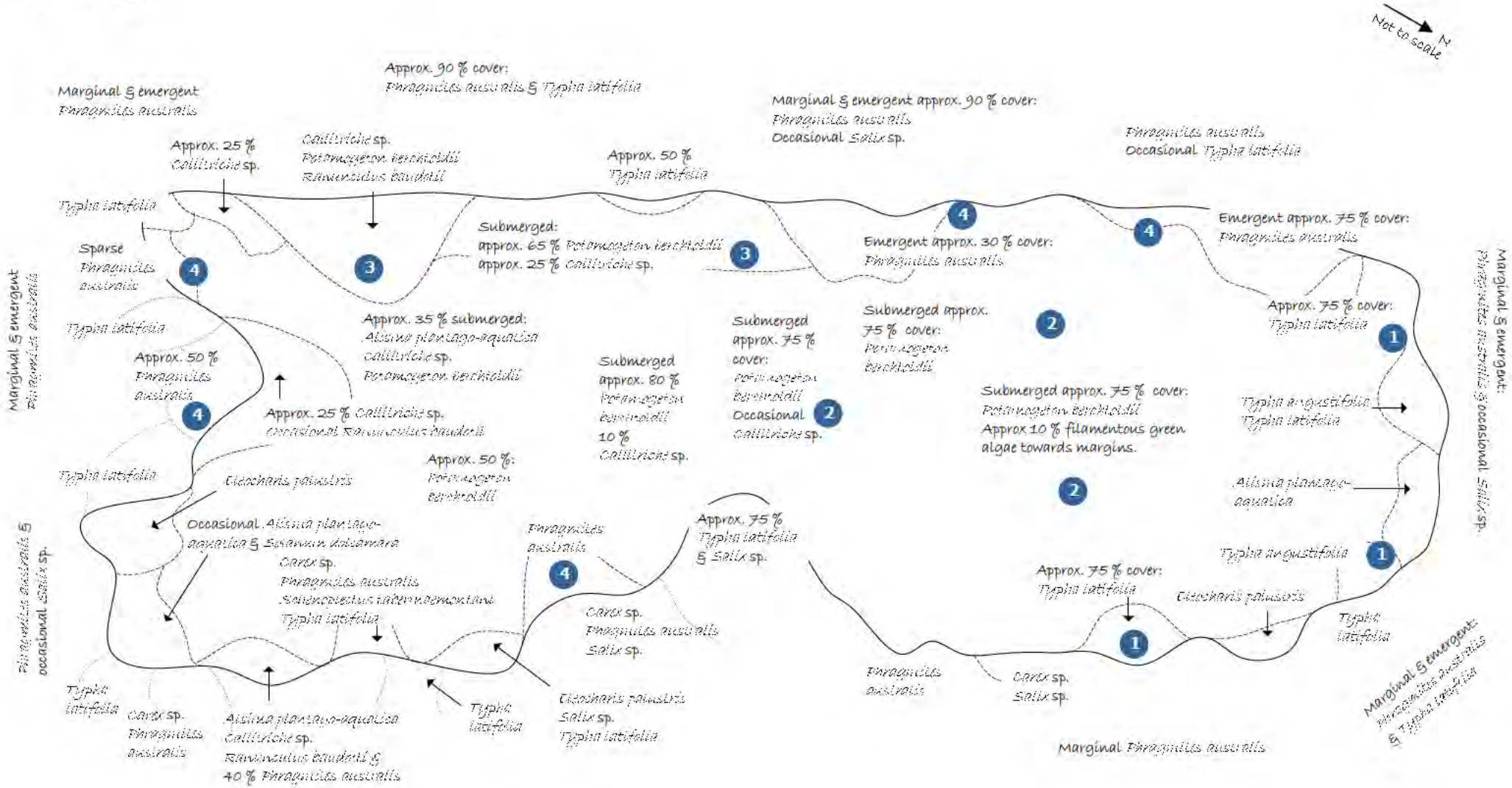
No visible submerged aquatic macrophytes.




Pond P5
Not to scale
N
Sample habitats:
1. Open water with submerged Chara vulgaris & Potamogeton pusillus
2. Marginal emergent Phragmites australis with Juncus sp. & Typha latifolia.
Marginal Phragmites australis
Typha latifolia
Marginal Phragmites australis
Marginal Phragmites australis
Typha latifolia
Juncus sp.
Juncus sp. & approx. 5 % Phragmites australis
Rumex sp.
Phragmites australis
Marginal Phragmites australis
Substratum principally bare mud with approx. 5 % submerged Chara vulgaris Potentilla pusilla
Rare submerged & floating filamentous green algae Spirogyra inflata group
Appox. 80 % Typha latifolia
Marginal approx. 95 % Phragmites australis approx. 5 % Typha latifolia
Juncus sp.
Juncus sp.
Approx. 30 % cover: Juncus sp. Lycopus europaeus Phragmites australis Rumex sp. Typha latifolia
Typha latifolia
Approx. 5 % emergent Alisma plantago-aquatica Phragmites australis
Marginal Phragmites australis
Approx. 95 % marginal Phragmites australis

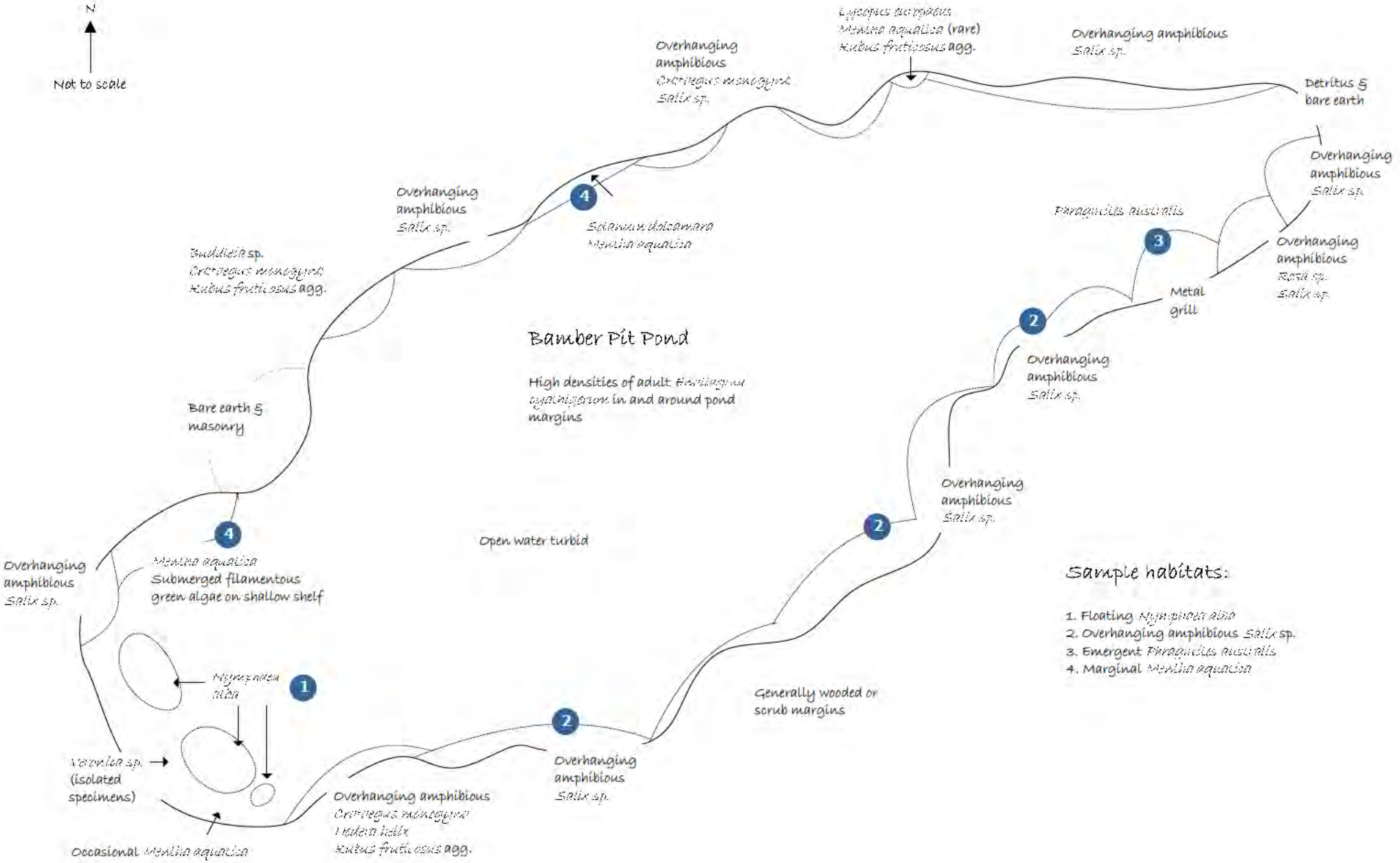

Pond P6-N
Not to scale
N
Pond P6-S
Marginal Phragmites australis
Occasional Salix sp.
Emergent approx 80 % cover:
Alisma plantago-aquatica
Bolboschoenus maritimus
Carex sp.
Eleocharis palustris
Emergent approx. 75 % cover:
Phragmites australis
Marginal approx. 95 % cover:
Phragmites australis
Occasional Salix sp.
Marginal
Typha latifolia
Submerged approx 50 % cover:
Principally Potamogeton pusillus
Occasional Chara vulgaris
& filamentous green algae
Substratum principally soft clay;
water column turbid.
Water depth between 35 - 100 cm.
Emergent:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Occasional emergent
Alisma plantago-aquatica
Marginal
Phragmites
australis
Phragmites australis &
patches of submerged
filamentous green algae
Marginal
Typha latifolia
Emergent approx. 5 % cover:
Phragmites australis
Emergent:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Bolboschoenus maritimus
Carex sp.
Emergent approx 40 %:
Bolboschoenus maritimus
Carex sp.
Emergent:
Typha latifolia
Phragmites australis
Emergent approx. 95 % cover:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Occasional
Chara vulgaris
Ranunculus baudotii
Emergent marginal:
Bolboschoenus maritimus
Carex sp.
Marginal Phragmites
australis
Marginal Phragmites australis
Sample habitats:
1. Open water with submerged Chara vulgaris & Potamogeton pusillus.
2. Marginal & emergent Bolboschoenus maritimus.
3. Marginal & emergent Phragmites australis.

Pond P6-S



Sample habitats:

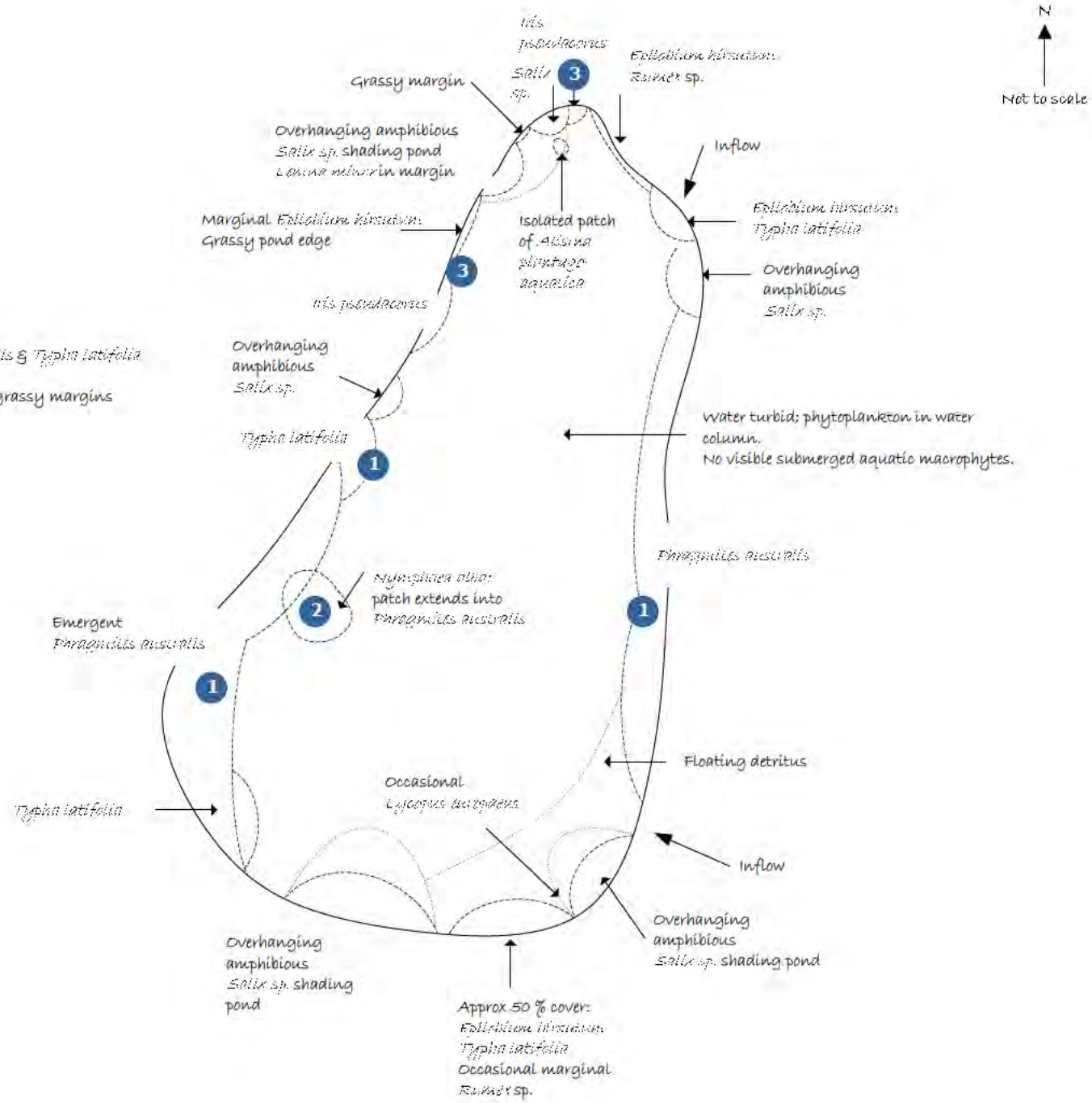
1. Emergent *Typha angustifolia* & *Typha latifolia*.
2. Submerged *Potamogeton berchtoldii*.
3. Submerged *Callitriche* sp., *Potamogeton berchtoldii* & *Ranunculus baudotii*.
4. Marginal & emergent *Phragmites australis*.


N
Not to scale
Lycopus europaeus
Mentha aquatica (rare)
Rubus fruticosus agg.
Overhanging amphibious
Salix sp.
Overhanging amphibious
Crataegus monogyna
Salix sp.
Detritus & bare earth
Overhanging amphibious
Salix sp.
Phragmites australis
Overhanging amphibious
Rosa sp.
Salix sp.
Metal grill
Overhanging amphibious
Salix sp.
Overhanging amphibious
Salix sp.
Solanum dulcamara
Mentha aquatica
Buddleja sp.
Crataegus monogyna
Rubus fruticosus agg.
Bamber Pit Pond
High densities of adult Enallagma cyathigerum in and around pond margins
Bare earth & masonry
Overhanging amphibious
Salix sp.
Mentha aquatica
Submerged filamentous green algae on shallow shelf
Open water turbid
Overhanging amphibious
Salix sp.
Myriophyllum alba
Veronica sp. (isolated specimens)
Occasional Mentha aquatica
Overhanging amphibious
Crataegus monogyna
Hedera helix
Rubus fruticosus agg.
Overhanging amphibious
Salix sp.
Generally wooded or scrub margins
Sample habitats:
1. Floating Myriophyllum alba
2. Overhanging amphibious Salix sp.
3. Emergent Phragmites australis
4. Marginal Mentha aquatica

Balancing Pond

Sample habitats:

1. Emergent *Paragmites australis* & *Typha latifolia*
2. Floating *Nymphaea alba*
3. Marginal *Iris pseudacorus* & grassy margins



Appendix 3 Survey data tables

Appendix 3 Table 1 Aquatic macroinvertebrate fauna recorded in the surveyed waterbodies.

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM -W- 1	BDM -W- 2	BDM -W- 3	BDM -W- 4	BDM -W- 5	BDM -W- 6	*BDM -W*
Cyrnus flavidus, McLachlan	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Holocentropus dubius (Rambur)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Polycentropodidae indet.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Polycentropodidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Tinodes waeneri (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Psychomyiidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agraylea multipunctata (Curtis)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hydroptila sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Oxyethira sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Hydroptilidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Athripsodes aterrimus (Stephens)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Leptocerus tineiformis, Curtis	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Mystacides longicornis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Oecetis furva (Rambur)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Triaenodes bicolor (Curtis)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Leptoceridae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Anabolia nervosa (Curtis)	0	0	0	0	0	0	*0*	0	0	1	0	0	0	0	0	0	0	0	*0*
Glyphotaelius pellucidus (Retzius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Limnephilus centralis, Curtis	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Limnephilus marmoratus, Curtis	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	1	0	*1*
Limnephilus lunatus, Curtis	0	3	1	1	1	0	*1*	6	0	0	3	0	0	0	0	0	1	0	*1*
Limnephilus rhombicus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Limnephilidae indet.	0	0	0	0	16	6	*22*	0	2	8	14	1	0	0	0	1	0	5	*6*
Total Limnephilidae	0	3	1	1	17	6	*23*	6	2	9	17	1	0	0	0	1	2	5	*8*
Molanna angustata, Curtis	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Molannidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Baetis rhodani (Pictet)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Cloeon dipterum (L.)	0	1	37	4	0	0	*0*	110	0	0	0	0	0	0	0	31	0	83	*114*
Total Baetidae	0	1	37	4	0	0	*0*	110	0	0	0	0	0	0	0	31	0	83	*114*
Caenis horaria (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Caenis luctuosa (Burmeister)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Caenis robusta, Eaton	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Caenidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Ephemera danica, Müller	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Ephemeridae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Aeshna cyanea (Müller)	0	0	0	0	0	0	*0*	0	0	0	1	0	0	0	0	0	0	0	*0*
Aeshna grandis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	1	0	0	*1*
Aeshna mixta (Latreille)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Aeshna sp.	0	0	0	0	0	0	*0*	0	0	0	18	0	0	0	0	0	0	0	*0*
Anax imperator, Leach	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Brachytron pratense (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Aeshnidae indet.	0	0	1	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Aeshnidae	0	0	1	0	0	0	*0*	0	0	0	19	0	0	0	0	1	0	0	*1*
Coenagrion puella (L.)	0	0	0	0	5	0	*5*	0	0	0	0	0	0	5	0	0	0	6	*11*
Enallagma cyathigerum (Charpentier)	0	0	0	0	3	0	*3*	0	3	0	0	0	0	0	0	0	0	0	*0*
Ischnura elegans (Vander Linden)	0	0	23	0	18	22	*40*	0	1	0	0	0	0	0	0	0	0	0	*0*
Coenagrionidae indet.	0	0	15	0	34	84	*118*	0	0	0	0	0	0	2	0	0	0	58	*60*
Total Coenagrionidae	0	0	38	0	60	106	*166*	0	4	0	0	0	0	7	0	0	0	64	*71*
Lestes sponsa (Hansemann)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	1	0	0	0	0	*1*
Lestes sp.	0	0	0	0	0	0	*0*	3	0	0	0	0	0	3	0	0	0	0	*3*
Total Lestidae	0	0	0	0	0	0	*0*	3	0	0	0	0	0	4	0	0	0	0	*4*
Libellula depressa, L.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sympetrum striolatum (Charpentier)	0	0	9	0	0	0	*0*	1	0	0	0	0	0	0	0	2	0	0	*2*
Sympetrum sp.	0	0	5	0	0	0	*0*	4	0	0	0	0	0	0	0	5	0	0	*5*
Total Libellulidae	0	0	14	0	0	0	*0*	5	0	0	0	0	0	0	0	7	0	0	*7*
Cataclysta lemnata (L.)	0	0	2	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Pyralidae	0	0	2	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sialis lutaria (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Sialidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Anisosticta novemdecimpunctata (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Coccinellidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dryops luridus (Erichson)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Dryopidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Acilius sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agabus bipustulatus (L.)	1	0	0	0	0	0	*0*	0	0	0	0	1	0	1	1	0	1	0	*3*
Agabus conspersus (Marsham)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agabus didymus (Olivier)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agabus nebulosus (Forster)	0	0	0	0	3	1	*4*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agabus sturmii (Gyllenhal)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Agabus/Ilybius larvae	1	16	33	6	0	0	*0*	89	66	5	0	50	3	11	0	79	0	0	*93*
Colymbetes fuscus (L.)	0	0	0	0	0	0	*0*	12	5	0	4	1	1	4	0	0	0	0	*5*
Colymbetinae group	0	2	2	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dytiscus sp.	0	0	13	0	6	4	*10*	9	0	0	7	0	0	1	0	3	0	0	*4*
Graphoderus sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	2	7	0	3	*12*
Graptodytes bilineatus (Sturm)	1	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Graptodytes pictus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	1	0	0	0	0	0	0	0	*0*
Hydroglyphus geminus (Fabricius)	0	0	0	0	0	4	*4*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hydroporus angustatus, Sturm	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	1	0	0	0	*1*
Hydroporus erythrocephalus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	1	0	0	0	0	0	0	*0*
Hydroporus incognitus, Sharp	0	0	0	0	0	0	*0*	0	2	0	0	0	0	0	0	0	0	0	*0*
Hydroporus palustris (L.)	0	0	2	0	1	0	*1*	0	1	0	1	1	0	0	0	0	0	0	*0*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Hydroporus planus (Fabricius)	18	10	0	2	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hydroporus sp.	9	20	71	13	0	0	*0*	0	0	0	19	13	5	0	0	1	32	0	*38*
Hygrotus impressopunctatus (Schaller)	1	0	0	0	0	0	*0*	0	1	0	0	1	0	0	0	0	1	0	*1*
Hygrotus inaequalis (Fabricius)	0	0	4	0	5	4	*9*	0	12	0	1	0	2	1	0	0	4	1	*8*
Hygrotus parallelogrammus (Ahrens)	0	0	0	0	0	1	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hygrotus versicolor (Schaller)	0	0	0	0	0	0	*0*	0	0	0	1	0	2	0	0	0	1	0	*3*
Hyphydrus ovatus (L.)	0	0	0	0	0	0	*0*	0	0	0	3	0	0	0	0	0	0	2	*2*
Ilybius ater (De Geer)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Ilybius fuliginosus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Laccophilus hyalinus (De Geer)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Laccophilus minutus (L.)	0	0	2	0	0	1	*1*	0	1	0	1	0	0	0	0	1	0	0	*1*
Laccophilus sp.	0	0	10	0	0	0	*0*	0	0	0	0	0	2	0	0	0	0	0	*2*
Rhantus frontalis (Marsham)	0	0	0	0	0	0	*0*	0	0	0	0	1	0	0	0	0	0	1	*1*
Rhantus suturalis (MacLeay)	0	0	1	0	0	0	*0*	0	0	0	0	0	1	0	0	0	0	0	*1*
Rhantus sp.	0	1	11	1	0	0	*0*	3	9	0	0	0	0	2	0	4	0	2	*8*
Total Dytiscidae	31	49	149	22	15	15	*30*	113	97	5	38	69	16	20	4	95	39	9	*183*
Oulimnius tuberculatus (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Elmidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Gyrinus caspius, Ménétriés	0	0	0	0	0	0	*0*	0	0	0	1	0	0	0	0	0	0	0	*0*
Gyrinus paykulli, Ochs	0	0	0	0	0	0	*0*	0	0	0	2	0	0	1	0	0	0	0	*1*
Gyrinus substriatus, Stephens	0	0	0	0	1	0	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Gyrinus sp.	0	0	0	0	0	0	*0*	2	0	0	4	0	0	0	0	0	0	0	*0*
Total Gyrinidae	0	0	0	0	1	0	*1*	2	0	0	7	0	0	1	0	0	0	0	*1*
Haliplus apicalis, Thomson	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	1	0	0	*1*
Haliplus immaculatus, Gerhardt	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Haliplus lineaticollis (Marsham)	0	0	8	0	1	1	*2*	0	0	2	1	0	0	0	0	0	0	0	*0*
Haliplus obliquus (Fabricius)	0	0	0	0	0	0	*0*	1	0	0	0	0	0	0	0	0	0	0	*0*
Haliplus ruficollis (DeGeer)	0	0	1	1	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Haliplus ruficollis group	0	0	0	0	0	0	*0*	0	0	0	0	0	0	1	0	0	0	0	*1*
Haliplus sibiricus, Motschulsky	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Haliplus sp.	0	0	10	0	0	0	*0*	0	0	0	0	0	3	0	0	0	8	0	*11*
Peltodytes caesus (Duftschmid)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	1	0	*1*
Total Haliplidae	0	0	19	1	1	1	*2*	1	0	2	1	0	3	1	0	1	9	0	*14*
Helophorus aequalis, Thomson	0	0	10	3	6	0	*6*	0	4	0	0	2	0	0	0	0	0	0	*0*
Helophorus alternans, Gené	2	0	5	1	5	2	*7*	0	4	0	0	0	0	0	0	0	0	0	*0*
Helophorus brevipalpis, Bedel	7	4	4	0	182	72	*254*	0	32	1	0	0	0	0	1	0	0	0	*1*
Helophorus grandis, Illiger	23	23	5	3	0	1	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Helophorus griseus, Herbst	0	0	0	0	16	7	*23*	0	0	0	0	2	0	0	0	0	0	0	*0*
Helophorus minutus, Fabricius	6	22	2	0	78	20	*98*	0	19	7	0	1	1	0	0	0	14	0	*15*
Helophorus obscurus, Mulsant	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Helophorus sp.	4	14	5	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Helophoridae	42	63	31	7	287	102	*389*	0	59	8	0	5	1	0	1	0	14	0	*16*
Heterocerus sp.	0	0	0	0	0	0	*0*	0	0	0	0	1	0	0	0	0	0	0	*0*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Total Heteroceridae	0	0	0	0	0	0	*0*	0	0	0	0	1	0	0	0	0	0	0	*0*
Ochthebius dilatatus, Stephens	3	2	0	0	0	0	*0*	0	6	0	0	0	0	0	0	0	0	0	*0*
Ochthebius minimus (Fabricius)	12	9	4	0	0	1	*1*	0	0	0	0	9	0	0	0	0	0	0	*0*
Ochthebius viridus, Peyron	0	1	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Hydraenidae	15	12	4	0	0	1	*1*	0	6	0	0	9	0	0	0	0	0	0	*0*
Hydrochus ignicollis (Motschulsky)	0	0	0	0	0	0	*0*	2	1	0	4	1	0	0	0	0	0	0	*0*
Total Hydrochidae	0	0	0	0	0	0	*0*	2	1	0	4	1	0	0	0	0	0	0	*0*
Anacaena bipustulata (Marsham)	0	0	0	0	0	0	*0*	7	0	0	0	4	0	0	0	0	0	0	*0*
Anacaena limbata (Fabricius)	60	45	3	1	0	0	*0*	0	42	63	21	19	0	0	0	0	0	0	*0*
Anacaena sp.	0	0	0	0	0	0	*0*	8	0	0	0	0	0	0	0	0	0	0	*0*
Berosus affinis (Brullé)	0	0	3	0	20	54	*74*	0	0	0	0	0	0	0	0	0	0	0	*0*
Berosus luridus (L.)	0	0	0	0	0	1	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Berosus signaticollis (Charpentier)	0	0	0	0	0	2	*2*	0	0	0	0	0	0	0	0	0	0	0	*0*
Berosus sp.	0	0	3	0	11	2	*13*	0	0	0	0	0	0	0	0	0	0	0	*0*
Cercyon sternalis (Sharp)	1	0	0	0	0	0	*0*	0	0	0	0	2	0	0	0	0	0	0	*0*
Cercyon tristis (Illiger)	1	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	1	*1*
Cymbiodyta marginellus (Fabricius)	1	0	0	0	0	0	*0*	1	1	0	1	1	0	0	0	0	0	0	*0*
Enochrus halophilus (Bedel)	0	0	1	0	0	0	*0*	0	2	0	0	0	0	0	0	0	0	0	*0*
Enochrus testaceus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Enochrus sp.	0	0	0	0	0	1	*1*	0	0	0	0	2	0	0	0	0	5	0	*5*
Helochares lividus (Forster)	0	0	0	0	0	1	*1*	1	0	0	0	0	0	0	0	0	0	0	*0*
Hydrobius fuscipes (L.)	1	0	1	0	0	0	*0*	6	4	1	1	8	0	0	0	0	6	0	*6*
Hydrophilus piceus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	17	0	*17*
Laccobius bipunctatus (Fabricius)	0	0	1	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Laccobius colon (Stephens)	0	0	0	0	0	1	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Laccobius minutus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Laccobius sp.	0	0	0	0	0	0	*0*	0	5	0	0	5	4	0	0	1	0	0	*5*
Megasternum concinnum (Marsham)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hydrophilidae indet.	10	25	37	0	2	0	*2*	6	0	0	0	0	0	0	0	0	0	0	*0*
Total Hydrophilidae	74	70	49	1	33	62	*95*	29	54	64	23	41	4	0	0	1	28	1	*34*
Noterus clavicornis, De Geer	0	0	0	0	0	0	*0*	0	3	0	0	0	0	0	0	0	0	0	*0*
Noterus sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Noteridae	0	0	0	0	0	0	*0*	0	3	0	0	0	0	0	0	0	0	0	*0*
Hygrobia hermanni (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Paelobiidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Cyphon sp.	21	1	0	1	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Elodes sp.	0	0	0	0	0	0	*0*	0	1	0	0	0	0	0	0	0	0	0	*0*
Hydrocyphon sp.	9	1	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Scirtes sp.	0	0	0	0	0	0	*0*	0	1	0	0	0	0	0	0	0	480	0	*480*
Total Scirtidae	30	2	0	1	0	0	*0*	0	2	0	0	0	0	0	0	0	480	0	*480*
Arctocorisa germari (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Callicorixa praeusta (Fieber)	0	0	0	0	0	18	*18*	15	0	0	0	0	62	63	11	1	0	9	*146*
Callicorixa sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	17	0	9	0	0	*26*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Corixa affinis/dentipes	0	0	0	0	0	0	*0*	0	0	3	0	0	0	0	0	0	0	22	*22*
Corixa affinis/panzeri	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Corixa punctata (Illiger)	0	0	0	0	1	0	*1*	0	0	0	0	0	0	1	0	0	0	0	*1*
Corixa punctata/iberica	0	0	0	0	0	0	*0*	32	0	0	0	0	28	13	13	0	0	38	*92*
Corixa sp.	0	0	1	2	34	12	*46*	19	0	0	4	0	34	0	8	17	3	0	*62*
Cymatia coleoptrata (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	2	*2*
Cymatia sp.	0	0	0	0	6	0	*6*	0	0	0	0	9	0	0	0	0	0	43	*43*
Hesperocorixa linnaei (Fieber)	0	0	2	0	0	0	*0*	0	4	0	0	0	0	0	0	0	0	0	*0*
Hesperocorixa moesta (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hesperocorixa sahlbergi (Fieber)	0	0	25	22	0	0	*0*	1	0	0	1	0	19	0	0	0	0	3	*22*
Hesperocorixa sp.	0	0	0	0	0	8	*8*	0	0	0	0	0	42	0	0	0	0	0	*42*
Miconecta scholtzi (Fieber)	0	0	0	0	0	0	*0*	0	0	0	1	0	0	0	0	1	0	0	*1*
Micronecta sp.	0	0	0	0	0	2	*2*	0	0	0	0	0	0	0	0	89	0	0	*89*
Paracorixa concinna (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	0	81	0	0	0	0	0	*81*
Sigara distincta/falleni/fallenoidea	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara dorsalis (Leach)	0	0	0	0	0	26	*26*	0	0	0	2	0	3	21	5	0	1	0	*30*
Sigara dorsalis/striata	0	0	2	1	0	9	*9*	1	0	0	0	0	0	16	4	0	0	13	*33*
Sigara falleni (Fieber)	0	0	0	0	0	0	*0*	0	0	2	0	0	0	0	0	0	0	0	*0*
Sigara falleni/iactans	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara fossarum (Leach)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara iactans, Jansson	0	0	0	0	0	2	*2*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara lateralis (Leach)	0	0	0	0	16	0	*16*	0	0	0	0	0	0	0	7	0	0	0	*7*
Sigara limitata (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara nigrolineata (Fieber)	0	0	0	0	0	4	*4*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara selecta (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Sigara sp.	0	0	0	0	110	58	*168*	108	0	10	0	0	182	222	12	77	0	0	*493*
Corixidae indet.	0	7	84	109	0	50	*50*	440	0	18	0	28	182	232	21	0	0	380	*815*
Total Corixidae	0	7	114	134	167	189	*356*	616	4	33	8	37	633	585	81	194	4	510	*2007*
Gerris lacustris (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	1	0	0	0	0	*1*
Gerris group	7	0	9	0	71	14	*85*	0	0	0	0	0	8	71	0	14	5	0	*98*
Total Gerridae	7	0	9	0	71	14	*85*	0	0	0	0	0	8	72	0	14	5	0	*99*
Hydrometra stagnorum (L.)	0	0	0	0	0	1	*1*	0	0	0	0	0	1	0	0	0	0	0	*1*
Total Hydrometridae	0	0	0	0	0	1	*1*	0	0	0	0	0	1	0	0	0	0	0	*1*
Ilyocoris cimicoides (L.)	0	0	0	0	0	0	*0*	0	0	0	2	0	0	17	0	21	11	0	*49*
Ilyocoris cimicoides /Naucoris maculatus	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Naucoridae	0	0	0	0	0	0	*0*	0	0	0	2	0	0	17	0	21	11	0	*49*
Renatra linearis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Nepidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Notonecta glauca, L.	0	0	0	0	0	0	*0*	1	1	0	1	0	0	0	0	0	0	0	*0*
Notonecta sp.	0	0	50	68	61	21	*82*	234	73	0	0	53	31	88	18	60	14	19	*230*
Total Notonectidae	0	0	50	68	61	21	*82*	235	74	0	1	53	31	88	18	60	14	19	*230*
Plea minutissima, Leach	0	0	0	0	0	44	*44*	66	0	0	31	0	0	8	1	85	0	109	*203*
Total Pleidae	0	0	0	0	0	44	*44*	66	0	0	31	0	0	8	1	85	0	109	*203*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Microvelia reticulata (Burmeister)	0	0	0	0	0	0	*0*	0	0	0	26	0	0	16	0	2	0	0	*18*
Microvelia sp.	0	0	0	0	0	0	*0*	0	0	0	14	0	0	5	0	0	0	0	*5*
Velia caprai, Tamanini	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Velia sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Veliidae	0	0	0	0	0	0	*0*	0	0	0	40	0	0	21	0	2	0	0	*23*
Saldula sp.	0	0	0	0	0	1	*1*	0	1	0	0	0	0	0	0	0	0	0	*0*
Total Saldidae	0	0	0	0	0	1	*1*	0	1	0	0	0	0	0	0	0	0	0	*0*
Asellus aquaticus (L.)	1311	601	72	538	92	140	*232*	340	0	24	0	0	98	278	0	238	128	170	*912*
Total Asellidae	1311	601	72	538	92	140	*232*	340	0	24	0	0	98	278	0	238	128	170	*912*
Total Cladocera [1]	0	0	1	93	0	1000	*1000*	0	0	0	1000	0	1000	650	1000	444	0	1000	*4094*
Total Copepoda	0	0	1	0	0	3	*3*	0	0	0	0	0	0	0	4	0	0	0	*4*
Crangonyx pseudogracilis, Bousfield	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	14	0	0	0	*14*
Total Crangonyctidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	14	0	0	0	*14*
Gammarus duebeni, Liljeborg	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Gammarus zaddachi, Sexton	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Gammarus sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Gammaridae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Ostracoda	0	0	0	0	0	7	*7*	15	0	0	4	0	1000	12	143	10	21	80	*1266*
Bithynia tentaculata (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Bithyniidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Potamopyrgus antipodarum (Gray)	0	0	1035	0	34	0	*34*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Hydrobiidae	0	0	1035	0	34	0	*34*	0	0	0	0	0	0	0	0	0	0	0	*0*
Galba truncatula (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	1	0	*1*
Lymnaea stagnalis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Radix balthica (L.)	42	30	157	0	88	178	*266*	230	17	34	0	0	0	0	110	0	0	0	*110*
Stagnicola fuscus agg. (Pfeiffer)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	1	0	0	*1*
Total Lymnaeidae	42	30	157	0	88	178	*266*	230	17	34	0	0	0	0	110	1	1	0	*112*
Physa group	504	0	1	0	63	0	*63*	98	0	31	0	0	97	83	51	118	183	0	*532*
Total Physidae	504	0	1	0	63	0	*63*	98	0	31	0	0	97	83	51	118	183	0	*532*
Anisus leucostoma (Millet)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Anisus vortex (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Planorbarius corneus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Planorbis planorbis (L.)	0	5	0	0	0	0	*0*	0	0	4	0	0	0	0	0	0	0	0	*0*
Planorbis sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Gyraulus albus (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	2	0	0	*2*
Gyraulus crista (L.)	0	0	0	0	0	13	*13*	92	0	0	0	0	66	210	0	0	98	12	*386*
Hippeutis complanatus (L.)	0	0	0	0	0	0	*0*	1	0	0	0	0	1	0	0	0	0	0	*1*
Planorbidae indet.	0	1	0	0	0	0	*0*	42	0	0	0	0	0	0	0	0	0	0	*0*
Total Planorbidae	0	6	0	0	0	13	*13*	135	0	4	0	0	67	210	0	2	98	12	*389*
Pisidium casertanum (Poli)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Pisidium spp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Musculium lacustre (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Sphaeriidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Oxyloma elegans (Rossmässler)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Oxyloma sp.	0	0	0	0	0	0	*0*	0	5	0	0	0	0	0	0	0	0	0	*0*
Total Succineidae	0	0	0	0	0	0	*0*	0	5	0	0	0	0	0	0	0	0	0	*0*
Valvata cristata, Müller	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	2	0	0	*2*
Total Valvatidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	2	0	0	*2*
Total Ceratopogonidae	0	0	0	0	0	0	*0*	0	0	0	1	0	0	0	0	0	0	0	*0*
Chaoborus crystallinus (DeGeer)	0	0	0	0	0	0	*0*	77	0	0	7	17	0	0	0	0	0	0	*0*
Chaoborus flavicans (Meigen)	0	0	0	0	0	0	*0*	81	0	0	27	0	0	0	0	2	0	1	*3*
Chaoborus sp.	0	0	0	21	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Chaoboridae	0	0	0	21	0	0	*0*	158	0	0	34	17	0	0	0	2	0	1	*3*
Total Chironomidae [1]	53	2101	322	623	740	198	*938*	1000	1000	290	560	730	429	740	470	210	375	1000	*3224*
Anopheles claviger (Meigen)	3	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Anopheles sp.	0	0	0	0	0	14	*14*	0	260	0	0	0	0	0	0	0	0	0	*0*
Culiseta alaskaensis/annulata	1	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Culiseta alaskaensis/annulata/subochrea	10	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Culisita sp.	1	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Culex pipiens, L	0	0	0	0	0	0	*0*	0	0	1	0	0	0	0	0	0	0	0	*0*
Culex sp.	0	0	0	0	0	0	*0*	0	90	19	0	0	0	0	0	0	0	0	*0*
Culicidae indet.	3	0	1	0	0	66	*66*	0	340	0	0	0	0	0	0	0	0	0	*0*
Total Culicidae	18	0	1	0	0	80	*80*	0	690	20	0	0	0	0	0	0	0	0	*0*
Dixa dilatata, Stobl	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dixa nebulosa, Meigen	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dixa sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dixella aestivalis (Meigen)	0	1	7	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dixella autumnalis (Meigen)	0	1	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Dixidae	0	2	7	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Dolichopodidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Ephydridae	0	0	28	0	0	1	*1*	0	0	0	0	0	0	0	0	1	4	0	*5*
Total Limoniidae	0	0	0	0	0	0	*0*	3	0	0	1	0	0	1	0	0	0	0	*1*
Total Muscidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Psychodidae	0	0	2	0	0	0	*0*	0	0	0	0	0	0	3	0	0	0	0	*3*
Total Ptychopteridae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	1	0	*1*
Total Sciomyzidae	0	0	0	0	0	0	*0*	6	0	0	0	0	0	0	0	0	7	0	*7*
Odontomyia sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	1	0	*1*
Oplodontha viridula (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Oxycera rara (Scopoli)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Oxycera nigricornis, Olivier	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Stratiomys singularior (Harris)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Stratiomys sp.	0	0	0	0	0	0	*0*	0	1	0	1	0	0	1	0	0	0	0	*1*
Stratiomyidae indet.	0	0	0	0	0	0	*0*	1	0	0	0	0	0	0	0	0	0	0	*0*
Total Stratiomyidae	0	0	0	0	0	0	*0*	1	1	0	1	0	0	1	0	0	1	0	*2*
Total Syrphidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	4	1	0	0	0	*5*
Total Tipulidae	0	0	8	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*

Taxon	BM1	BM2	BM3	BM4	NP1	NP2	*NP*	SM1	SM2	SM3	SM4	SM5	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*
Alboglossiphonia heteroclita (L.)	0	0	0	0	1	0	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Helobdella stagnalis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Hemiclepsis marginata (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Thermomyzon tessulatum (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Glossiphoniidae	0	0	0	0	1	0	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dendrocoelum lacteum (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Dendrocoelidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Dugesia polychroa group	0	0	0	0	0	0	*0*	0	18	0	0	0	0	0	0	0	0	0	*0*
Total Dugesiidae	0	0	0	0	0	0	*0*	0	18	0	0	0	0	0	0	0	0	0	*0*
Polycelis nigra group	0	0	0	0	0	0	*0*	0	0	18	0	0	0	0	0	0	0	0	*0*
Total Planariidae	0	0	0	0	0	0	*0*	0	0	18	0	0	0	0	0	0	0	0	*0*
Unidentified Tricladida	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Oligochaeta	1	5	0	1	0	1	*1*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Collembola	68	6	2	0	0	4	*4*	0	9	0	0	0	0	0	4	0	0	0	*4*
Total Hydracarina	0	1	1	0	0	0	*0*	204	0	0	0	0	0	0	0	11	19	71	*101*
Total Nematoda	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Hydrozoa	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Terrestrial species recorded:																			
Bembidion sp.	0	0	0	0	0	0	*0*	0	0	0	0	3	0	0	0	0	0	0	*0*
Demetrias imperialis, Germar	0	0	0	0	0	0	*0*	2	0	1	0	0	0	0	0	0	0	0	*0*
Odacantha melanura (L.)	0	0	0	0	0	0	*0*	0	0	0	0	1	0	0	0	0	0	0	*0*
Total Carabidae	0	0	0	0	0	0	*0*	2	0	1	0	4	0	0	0	0	0	0	*0*
Cassida viridis, L.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Galerucella sp.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Chrysomelidae indet.	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Chrysomelidae	0	0	0	0	0	0	*0*	0	0	0	0	0	0	0	0	0	0	0	*0*
Total Staphylinidae	0	0	0	0	3	0	*3*	1	2	0	0	2	0	0	0	0	0	0	*0*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Cyrnus flavidus, McLachlan	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Holocentropus dubius (Rambur)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Polycentropodidae indet.	4	2	1	*7*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Polycentropodidae	4	2	1	*7*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Tinodes waeneri (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Psychomyiidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agraylea multipunctata (Curtis)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroptila sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Oxyethira sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Hydroptilidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Athripsodes aterrimus (Stephens)	0	0	1	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Leptocerus tineiformis, Curtis	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Mystacides longicornis (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Oecetis furva (Rambur)	0	0	1	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Triaenodes bicolor (Curtis)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Total Leptoceridae	0	0	2	*2*	0	0	*0*	0	0	*0*	0	1	1	*2*	0	0	0	0	*0*
Anabolia nervosa (Curtis)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Glyphotaelius pellucidus (Retzius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilus centralis, Curtis	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Limnephilus marmoratus, Curtis	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilus lunatus, Curtis	0	0	1	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilus rhombicus (L.)	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilidae indet.	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	3	*3*	1	0	0	0	*1*
Total Limnephilidae	1	1	1	*3*	0	0	*0*	0	0	*0*	0	0	4	*4*	1	0	0	0	*1*
Molanna angustata, Curtis	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Molannidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Baetis rhodani (Pictet)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Cloeon dipterum (L.)	51	20	20	*91*	0	0	*0*	0	0	*0*	14	12	21	*47*	19	0	86	51	*156*
Total Baetidae	51	20	20	*91*	0	0	*0*	0	0	*0*	14	12	21	*47*	19	0	86	51	*156*
Caenis horaria (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	4	*4*
Caenis luctuosa (Burmeister)	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Caenis robusta, Eaton	2	2	0	*4*	0	0	*0*	0	0	*0*	0	0	4	*4*	0	0	2	0	*2*
Total Caenidae	3	2	0	*5*	0	0	*0*	0	0	*0*	0	0	4	*4*	0	0	2	4	*6*
Ephemera danica, Müller	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Ephemeridae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Aeshna cyanea (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Aeshna grandis (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Aeshna mixta (Latreille)	0	0	0	*0*	0	0	*0*	1	4	*5*	0	0	0	*0*	0	0	0	0	*0*
Aeshna sp.	6	2	0	*8*	4	0	*4*	0	0	*0*	1	11	14	*26*	2	**0**	0	7	*9*
Anax imperator, Leach	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	5	*6*	0	**0**	0	1	*1*
Brachytron pratense (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	1	*1*
Aeshnidae indet.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Aeshnidae	6	2	0	*8*	4	0	*4*	1	4	*5*	1	13	19	*33*	3	0	0	9	*12*
Coenagrion puella (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	13	3	*16*	0	0	0	4	*4*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Enallagma cyathigerum (Charpentier)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ischnura elegans (Vander Linden)	26	17	4	*47*	0	0	*0*	0	0	*0*	0	4	1	*5*	26	0	6	19	*51*
Coenagrionidae indet.	8	0	6	*14*	0	0	*0*	0	0	*0*	0	16	19	*35*	51	0	13	0	*64*
Total Coenagrionidae	34	17	10	*61*	0	0	*0*	0	0	*0*	0	33	23	*56*	77	0	19	23	*119*
Lestes sponsa (Hansemann)	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Lestes sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Lestidae	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Libellula depressa, L.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Sympetrum striolatum (Charpentier)	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	1	*1*	0	0	0	0	*0*
Sympetrum sp.	0	0	0	*0*	0	0	*0*	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Total Libellulidae	0	0	0	*0*	0	0	*0*	0	3	*3*	0	0	2	*2*	0	0	0	0	*0*
Cataclysta lemnata (L.)	3	0	0	*3*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Pyralidae	3	0	0	*3*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Sialis lutaria (L.)	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Sialidae	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Anisosticta novemdecimpunctata (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	3	1	*4*	0	0	0	0	*0*
Total Coccinellidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	3	1	*4*	0	0	0	0	*0*
Dryops luridus (Erichson)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Dryopidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Acilius sp.	4	2	0	*6*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus bipustulatus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus conspersus (Marsham)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus didymus (Olivier)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus nebulosus (Forster)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus sturmii (Gyllenhal)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus/Ilybius larvae	58	9	2	*69*	15	1	*16*	0	26	*26*	0	0	0	*0*	0	0	0	44	*44*
Colymbetes fuscus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	3	0	*3*	0	0	0	2	*2*
Colymbetinae group	2	0	0	*2*	8	0	*8*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dytiscus sp.	13	0	0	*13*	0	0	*0*	0	0	*0*	0	2	0	*2*	0	0	0	0	*0*
Graphoderus sp.	9	0	0	*9*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Graptodytes bilineatus (Sturm)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Graptodytes pictus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroglyphus geminus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus angustatus, Sturm	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus erythrocephalus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus incognitus, Sharp	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus palustris (L.)	0	0	0	*0*	2	0	*2*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus planus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus sp.	1	16	0	*17*	5	1	*6*	1	2	*3*	0	0	0	*0*	0	0	0	0	*0*
Hygrotus impressopunctatus (Schaller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	1	0	*1*
Hygrotus inaequalis (Fabricius)	1	0	6	*7*	1	0	*1*	0	1	*1*	0	1	0	*1*	0	0	1	0	*1*
Hygrotus parallelogrammus (Ahrens)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hygrotus versicolor (Schaller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hyphydrus ovatus (L.)	2	4	3	*9*	1	0	*1*	0	0	*0*	0	0	1	*1*	0	0	0	3	*3*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Ilybius ater (De Geer)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ilybius fuliginosus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Laccophilus hyalinus (De Geer)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Laccophilus minutus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	1	*1*	0	1	0	0	*1*
Laccophilus sp.	15	0	1	*16*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Rhantus frontalis (Marsham)	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Rhantus suturalis (MacLeay)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Rhantus sp.	16	2	0	*18*	0	0	*0*	0	6	*6*	0	1	0	*1*	0	0	0	0	*0*
Total Dytiscidae	121	34	12	*167*	32	2	*34*	1	36	*37*	0	7	2	*9*	0	1	2	49	*52*
Oulimnius tuberculatus (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Elmidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus caspius, Ménétriés	0	0	0	*0*	0	1	*1*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus paykulli, Ochs	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus substriatus, Stephens	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus sp.	9	11	0	*20*	6	1	*7*	0	0	*0*	0	8	3	*11*	0	0	0	0	*0*
Total Gyrinidae	9	12	0	*21*	6	2	*8*	0	0	*0*	0	8	3	*11*	0	0	0	0	*0*
Haliplus apicalis, Thomson	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Haliplus immaculatus, Gerhardt	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Haliplus lineaticollis (Marsham)	0	1	2	*3*	0	0	*0*	0	4	*4*	0	0	0	*0*	0	0	0	0	*0*
Haliplus obliquus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Haliplus ruficollis (DeGeer)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Haliplus ruficollis group	0	0	1	*1*	0	0	*0*	2	1	*3*	0	3	0	*3*	0	0	0	0	*0*
Haliplus sibiricus, Motschulsky	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Haliplus sp.	0	34	0	*34*	0	0	*0*	0	16	*16*	0	0	0	*0*	0	0	0	0	*0*
Peltodytes caesus (Duftschmid)	0	6	0	*6*	0	0	*0*	2	1	*3*	0	1	0	*1*	0	0	0	0	*0*
Total Haliplidae	0	41	3	*44*	0	0	*0*	4	23	*27*	0	4	0	*4*	0	0	0	1	*1*
Helophorus aequalis, Thomson	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Helophorus alternans, Gené	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	2	1	0	*3*
Helophorus brevipalpis, Bedel	8	0	0	*8*	1	0	*1*	0	9	*9*	0	0	63	*63*	18	0	14	1	*33*
Helophorus grandis, Illiger	0	0	0	*0*	0	0	*0*	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Helophorus griseus, Herbst	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	2	*2*	0	0	0	0	*0*
Helophorus minutus, Fabricius	1	0	0	*1*	0	0	*0*	0	3	*3*	0	5	0	*5*	0	6	11	6	*23*
Helophorus obscurus, Mulsant	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Helophorus sp.	1	1	1	*3*	2	0	*2*	1	12	*13*	0	0	0	*0*	0	0	19	0	*19*
Total Helophoridae	10	1	1	*12*	3	0	*3*	1	28	*29*	0	5	65	*70*	18	8	45	7	*78*
Heterocerus sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Heteroceridae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ochthebius dilatatus, Stephens	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ochthebius minimus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	4	*4*	0	0	0	0	*0*
Ochthebius viridus, Peyron	1	0	0	*1*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Hydraenidae	1	0	0	*1*	0	0	*0*	0	1	*1*	0	0	4	*4*	0	0	0	0	*0*
Hydrochus ignicollis (Motschulsky)	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Hydrochidae	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anacaena bipustulata (Marsham)	4	0	0	*4*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Anacaena limbata (Fabricius)	4	0	0	*4*	1	0	*1*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anacaena sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Berosus affinis (Brullé)	0	0	0	*0*	0	0	*0*	0	1	*1*	24	8	2	*34*	0	0	11	0	*11*
Berosus luridus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Berosus signaticollis (Charpentier)	0	0	0	*0*	0	0	*0*	0	0	*0*	2	0	0	*2*	0	0	0	0	*0*
Berosus sp.	3	0	0	*3*	0	2	*2*	2	2	*4*	7	0	0	*7*	0	0	0	0	*0*
Cercyon sternalis (Sharp)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Cercyon tristis (Illiger)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Cymbiodyta marginellus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Enochrus halophilus (Bedel)	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Enochrus testaceus (Fabricius)	0	1	0	*1*	1	0	*1*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Enochrus sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Helochares lividus (Forster)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydrobius fuscipes (L.)	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Hydrophilus piceus (L.)	0	0	0	*0*	0	0	*0*	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Laccobius bipunctatus (Fabricius)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Laccobius colon (Stephens)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Laccobius minutus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	1	0	0	*1*
Laccobius sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Megasternum concinnum (Marsham)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydrophilidae indet.	34	1	1	*36*	4	1	*5*	0	14	*14*	0	0	0	*0*	0	4	0	0	*4*
Total Hydrophilidae	47	2	1	*50*	6	3	*9*	2	19	*21*	33	8	2	*43*	1	5	11	1	*18*
Noterus clavicornis, De Geer	2	0	0	*2*	0	0	*0*	0	2	*2*	0	3	5	*8*	0	0	1	1	*2*
Noterus sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	**0**	0	0	*0*
Total Noteridae	2	0	0	*2*	0	0	*0*	0	2	*2*	0	3	5	*8*	0	0	1	1	*2*
Hygrobia hermanni (Fabricius)	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Paelobiidae	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Cyphon sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Elodes sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydrocyphon sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Scirtes sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Scirtidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Arctocorisa germari (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	3	*4*	0	**0**	0	0	*0*
Callicorixa praeusta (Fieber)	4	5	4	*13*	8	1	*9*	12	0	*12*	0	9	2	*11*	0	2	0	0	*2*
Callicorixa sp.	0	2	5	*7*	17	0	*17*	0	0	*0*	0	2	0	*2*	0	7	0	0	*7*
Corixa affinis/dentipes	0	0	0	*0*	0	0	*0*	0	0	*0*	0	9	0	*9*	1	0	0	2	*3*
Corixa affinis/panzeri	0	0	0	*0*	0	0	*0*	6	1	*7*	0	0	0	*0*	0	0	0	0	*0*
Corixa punctata (Illiger)	0	1	1	*2*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	19	0	*19*
Corixa punctata/iberica	1	0	0	*1*	0	0	*0*	18	6	*24*	3	28	0	*31*	40	0	14	9	*63*
Corixa sp.	0	1	0	*1*	1	1	*2*	0	8	*8*	19	41	18	*78*	0	8	83	5	*96*
Cymatia coleoptrata (Fabricius)	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	1	2	0	*3*
Cymatia sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	14	12	0	*26*
Hesperocorixa linnaei (Fieber)	0	9	0	*9*	0	0	*0*	9	2	*11*	7	0	0	*7*	0	0	0	0	*0*
Hesperocorixa moesta (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Hesperocorixa sahlbergi (Fieber)	0	3	0	*3*	0	2	*2*	3	3	*6*	0	0	0	*0*	0	0	4	0	*4*
Hesperocorixa sp.	0	0	0	*0*	4	1	*5*	0	27	*27*	21	18	0	*39*	0	0	0	0	*0*
Miconecta scholtzi (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	23	0	0	0	*23*
Micronecta sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	63	0	0	0	*63*
Paracorixa concinna (Fieber)	0	0	1	*1*	0	0	*0*	0	0	*0*	81	4	0	*85*	0	0	0	0	*0*
Sigara distincta/falleni/fallenoidea	0	0	0	*0*	0	0	*0*	10	2	*12*	0	0	0	*0*	0	0	0	0	*0*
Sigara dorsalis (Leach)	0	0	0	*0*	0	0	*0*	2	0	*2*	19	16	4	*39*	0	0	9	0	*9*
Sigara dorsalis/striata	0	0	0	*0*	1	1	*2*	38	2	*40*	0	0	18	*18*	0	18	3	0	*21*
Sigara falleni (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	6	2	0	0	*8*
Sigara falleni/iactans	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	8	0	0	*8*
Sigara fossarum (Leach)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	3	0	0	0	*3*
Sigara iactans, Jansson	0	0	0	*0*	0	0	*0*	0	0	*0*	12	5	2	*19*	0	3	0	0	*3*
Sigara lateralis (Leach)	0	0	0	*0*	3	6	*9*	36	0	*36*	49	0	14	*63*	0	0	0	0	*0*
Sigara limitata (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	9	0	*9*	0	0	0	0	*0*
Sigara nigrolineata (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	12	0	*12*	0	0	0	0	*0*
Sigara selecta (Fieber)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Sigara sp.	2	0	0	*2*	2	0	*2*	0	0	*0*	144	103	0	*247*	92	15	130	86	*323*
Corixidae indet.	312	69	26	*407*	63	60	*123*	536	129	*665*	180	92	58	*330*	0	13	104	61	*178*
Total Corixidae	319	90	37	*446*	99	72	*171*	671	180	*851*	535	349	119	*1003*	229	91	380	163	*863*
Gerris lacustris (L.)	0	0	0	*0*	0	0	*0*	0	3	*3*	0	3	0	*3*	0	0	0	3	*3*
Gerris group	4	2	0	*6*	0	0	*0*	1	123	*124*	0	71	55	*126*	11	2	3	27	*43*
Total Gerridae	4	2	0	*6*	0	0	*0*	1	126	*127*	0	74	55	*129*	11	2	3	30	*46*
Hydrometra stagnorum (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Hydrometridae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ilyocoris cimicoides (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	61	69	*130*	0	0	21	9	*30*
Ilyocoris cimicoides /Naucoris maculatus	54	3	2	*59*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Naucoridae	54	3	2	*59*	0	0	*0*	0	0	*0*	0	61	69	*130*	0	0	21	9	*30*
Renatra linearis (L.)	0	0	0	*0*	0	0	*0*	0	2	*2*	0	1	0	*1*	0	0	0	0	*0*
Total Nepidae	0	0	0	*0*	0	0	*0*	0	2	*2*	0	1	0	*1*	0	0	0	0	*0*
Notonecta glauca, L.	0	1	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Notonecta sp.	52	25	10	*87*	20	2	*22*	5	27	*32*	91	81	125	*297*	97	58	9	95	*259*
Total Notonectidae	52	26	10	*88*	20	2	*22*	5	27	*32*	91	81	125	*297*	97	58	9	95	*259*
Plea minutissima, Leach	209	25	128	*362*	7	2	*9*	5	6	*11*	62	137	70	*269*	9	32	98	17	*156*
Total Pleidae	209	25	128	*362*	7	2	*9*	5	6	*11*	62	137	70	*269*	9	32	98	17	*156*
Microvelia reticulata (Burmeister)	11	0	1	*12*	8	2	*10*	0	0	*0*	0	30	18	*48*	8	0	34	2	*44*
Microvelia sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	43	91	*134*	2	0	52	0	*54*
Velia caprai, Tamanini	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Velia sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Veliidae	11	0	1	*12*	8	2	*10*	0	0	*0*	0	73	109	*182*	10	0	86	2	*98*
Saldula sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Total Saldidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Asellus aquaticus (L.)	44	68	76	*188*	0	0	*0*	0	6	*6*	13	71	42	*126*	380	0	82	126	*588*
Total Asellidae	44	68	76	*188*	0	0	*0*	0	6	*6*	13	71	42	*126*	380	0	82	126	*588*
Total Cladocera [1]	25	23	42	*90*	2000	28	*2028*	0	1	*1*	1000	0	0	*1000*	0	0	1500	0	*1500*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Copepoda	7	1	2	*10*	0	0	*0*	1	0	*1*	0	137	0	*137*	0	0	0	163	*163*
Crangonyx pseudogracilis, Bousfield	0	0	0	*0*	0	0	*0*	0	3	*3*	0	3	0	*3*	41	0	18	6	*65*
Total Crangonyctidae	0	0	0	*0*	0	0	*0*	0	3	*3*	0	3	0	*3*	41	0	18	6	*65*
Gammarus duebeni, Liljeborg	0	0	0	*0*	0	0	*0*	0	0	*0*	176	13	0	*189*	19	8	137	0	*164*
Gammarus zaddachi, Sexton	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	4	0	0	0	*4*
Gammarus sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	82	51	132	*265*	9	10	222	3	*244*
Total Gammaridae	0	0	0	*0*	0	0	*0*	0	0	*0*	258	64	132	*454*	32	18	359	3	*412*
Total Ostracoda	35	5	1	*41*	0	0	*0*	20	24	*44*	21	42	23	*86*	0	0	19	19	*38*
Bithynia tentaculata (L.)	0	0	0	*0*	0	0	*0*	0	14	*14*	5	5	10	*20*	47	0	7	0	*54*
Total Bithyniidae	0	0	0	*0*	0	0	*0*	0	14	*14*	5	5	10	*20*	47	0	7	0	*54*
Potamopyrgus antipodarum (Gray)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	18	*18*	82	0	0	11	*93*
Total Hydrobiidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	18	*18*	82	0	0	11	*93*
Galba truncatula (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Lymnaea stagnalis (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	**0**	0	0	*0*
Radix balthica (L.)	3219	1492	85	*4796*	0	0	*0*	44	1180	*1224*	80	125	108	*313*	228	66	108	177	*579*
Stagnicola fuscus agg. (Pfeiffer)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Lymnaeidae	3219	1492	85	*4796*	0	0	*0*	44	1180	*1224*	80	125	108	*313*	228	66	108	177	*579*
Physa group	113	140	29	*282*	0	0	*0*	7	27	*34*	0	75	66	*141*	4	4	72	17	*97*
Total Physidae	113	140	29	*282*	0	0	*0*	7	27	*34*	0	75	66	*141*	4	4	72	17	*97*
Anisus leucostoma (Millet)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anisus vortex (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Planorbarius corneus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	12	*12*
Planorbis planorbis (L.)	0	0	0	*0*	0	0	*0*	0	35	*35*	0	6	3	*9*	93	0	0	0	*93*
Planorbis sp.	0	0	0	*0*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Gyraulus albus (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	4	0	*4*
Gyraulus crista (L.)	416	191	23	*630*	0	0	*0*	1	0	*1*	0	0	0	*0*	0	0	183	0	*183*
Hippeutis complanatus (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	8	0	*8*	0	0	0	0	*0*
Planorbidae indet.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	12	*12*	0	**0**	0	0	*0*
Total Planorbidae	416	191	23	*630*	0	0	*0*	2	35	*37*	0	14	15	*29*	93	0	187	12	*292*
Pisidium casertanum (Poli)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Pisidium spp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	**0**	8	0	*8*
Musculium lacustre (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	3	**0**	0	0	*3*
Total Sphaeriidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	3	0	8	0	*11*
Oxyloma elegans (Rossmässler)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Oxyloma sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Succineidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Valvata cristata, Müller	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Valvatidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Ceratopogonidae	0	1	0	*1*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	1	0	*1*
Chaoborus crystallinus (DeGeer)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Chaoborus flavicans (Meigen)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Chaoborus sp.	40	86	98	*224*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	**0**	0	0	*0*
Total Chaoboridae	40	86	98	*224*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Chironomidae [1]	790	279	928	*1997*	79	2019	*2098*	70	669	*739*	1000	83	31	*1114*	490	340	380	430	*1640*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Anopheles claviger (Meigen)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anopheles sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culiseta alaskaensis/annulata	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culiseta alaskaensis/annulata/subochrea	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culisita sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culex pipiens, L	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culex sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culicidae indet.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Culicidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dixa dilatata, Stobl	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dixa nebulosa, Meigen	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dixa sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dixella aestivalis (Meigen)	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	2	*2*	0	0	0	1	*1*
Dixella autumnalis (Meigen)	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Dixidae	1	0	0	*1*	0	0	*0*	0	1	*1*	0	0	2	*2*	0	0	0	1	*1*
Total Dolichopodidae	0	0	0	*0*	3	0	*3*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Ephydridae	2	0	0	*2*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Limoniidae	2	1	0	*3*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Muscidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Psychodidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Total Ptychopteridae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Sciomyzidae	2	1	0	*3*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Odontomyia sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Oplodontha viridula (Fabricius)	1	0	0	*1*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Oxycera rara (Scopoli)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Oxycera nigricornis, Olivier	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Stratiomys singularior (Harris)	1	0	0	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Stratiomys sp.	2	0	0	*2*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Stratiomyidae indet.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Stratiomyidae	4	0	0	*4*	0	0	*0*	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Syrphidae	0	0	1	*1*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Tipulidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Alboglossiphonia heteroclita (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Helobdella stagnalis (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	18	1	0	0	*19*
Hemiclepsis marginata (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Thermomyzon tessulatum (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Glossiphoniidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	18	1	0	0	*19*
Dendrocoelum lacteum (Müller)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Total Dendrocoelidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Dugesia polychroa group	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	3	*3*	70	0	45	19	*134*
Total Dugesiidae	0	0	0	*0*	0	0	*0*	0	1	*1*	0	0	3	*3*	70	0	45	19	*134*
Polycelis nigra group	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	183	0	0	0	*183*
Total Planariidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	183	0	0	0	*183*
Unidentified Tricladida	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*

Taxon	BDM -N-1	BDM -N-2	BDM -N-3	*BDM -N*	P3-1	P3-2	*P3*	P5a	P5b	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Oligochaeta	0	0	0	*0*	0	0	*0*	6	5	*11*	0	0	0	*0*	0	1	15	0	*16*
Total Collembola	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Hydracarina	80	6	33	*119*	0	3	*3*	2	2	*4*	0	18	0	*18*	0	75	15	4	*94*
Total Nematoda	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	2	*2*	0	3	0	0	*3*
Total Hydrozoa	0	0	0	*0*	0	0	*0*	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Terrestrial species recorded:																			
Bembidion sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Demetrias imperialis, Germar	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	4	*4*
Odacantha melanura (L.)	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Carabidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	1	0	*1*	0	0	0	4	*4*
Cassida viridis, L.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Galerucella sp.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Chrysomelidae indet.	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Total Chrysomelidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Total Staphylinidae	0	0	0	*0*	0	0	*0*	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Cyrnus flavidus, McLachlan	0	0	0	0	0	1	*1*	1	0	0	0	*1*
Holocentropus dubius (Rambur)	0	0	0	0	3	0	*3*	0	0	0	0	*0*
Polycentropodidae indet.	0	0	0	1	12	3	*16*	0	0	0	1	*1*
Total Polycentropodidae	0	0	0	1	15	4	*20*	1	0	0	1	*2*
Tinodes waeneri (L.)	0	0	0	0	0	1	*1*	0	0	1	1	*2*
Total Psychomyiidae	0	0	0	0	0	1	*1*	0	0	1	1	*2*
Agraylea multipunctata (Curtis)	0	0	0	0	0	0	*0*	0	0	0	3	*3*
Hydroptila sp.	4	0	0	0	0	0	*0*	0	0	0	0	*0*
Oxyethira sp.	0	0	0	0	8	0	*8*	0	0	0	0	*0*
Total Hydroptilidae	4	0	0	0	8	0	*8*	0	0	0	3	*3*
Athripsodes aterrimus (Stephens)	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Leptocerus tineiformis, Curtis	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Mystacides longicornis (L.)	0	0	0	0	3	5	*8*	0	0	0	0	*0*
Oecetis furva (Rambur)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Triaenodes bicolor (Curtis)	0	0	0	0	0	0	*0*	0	0	0	1	*1*
Total Leptoceridae	0	0	1	0	4	5	*9*	0	0	0	1	*1*
Anabolia nervosa (Curtis)	5	0	0	0	0	0	*0*	0	0	0	0	*0*
Glyphotaelius pellucidus (Retzius)	17	0	0	0	5	0	*5*	0	0	0	0	*0*
Limnephilus centralis, Curtis	0	0	0	0	2	3	*5*	0	0	0	3	*3*
Limnephilus marmoratus, Curtis	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Limnephilus lunatus, Curtis	58	21	106	1	5	17	*23*	0	0	0	2	*2*
Limnephilus rhombicus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Limnephilidae indet.	138	163	11	14	10	58	*82*	0	2	0	0	*2*
Total Limnephilidae	218	184	117	15	22	79	*116*	0	2	0	5	*7*
Molanna angustata, Curtis	0	0	0	0	0	0	*0*	0	0	0	1	*1*
Total Molannidae	0	0	0	0	0	0	*0*	0	0	0	1	*1*
Baetis rhodani (Pictet)	3	0	0	0	0	0	*0*	0	0	0	0	*0*
Cloeon dipterum (L.)	72	230	1	38	121	183	*342*	13	320	24	150	*507*
Total Baetidae	75	230	1	38	121	183	*342*	13	320	24	150	*507*
Caenis horaria (L.)	0	0	0	6	4	1	*11*	4	1	9	58	*72*
Caenis luctuosa (Burmeister)	5	2	0	0	0	0	*0*	0	0	0	2	*2*
Caenis robusta, Eaton	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Caenidae	5	2	0	6	4	1	*11*	4	1	9	60	*74*
Ephemera danica, Müller	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Total Ephemeridae	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Aeshna cyanea (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Aeshna grandis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Aeshna mixta (Latreille)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Aeshna sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Anax imperator, Leach	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Brachytron pratense (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Aeshnidae indet.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Aeshnidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Coenagrion puella (L.)	0	0	0	18	4	3	*25*	0	0	7	17	*24*
Enallagma cyathigerum (Charpentier)	0	0	0	0	2	1	*3*	0	0	0	14	*14*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Ischnura elegans (Vander Linden)	0	0	0	31	12	1	*44*	3	0	21	6	*30*
Coenagrionidae indet.	0	0	0	76	62	31	*169*	21	14	13	110	*158*
Total Coenagrionidae	0	0	0	125	80	36	*241*	24	14	41	147	*226*
Lestes sponsa (Hansemann)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Lestes sp.	0	0	0	0	0	0	*0*	0	1	0	0	*1*
Total Lestidae	0	0	0	0	0	0	*0*	0	1	0	0	*1*
Libellula depressa, L.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sympetrum striolatum (Charpentier)	0	2	0	0	0	1	*1*	0	0	0	0	*0*
Sympetrum sp.	0	7	1	0	0	0	*0*	0	0	0	0	*0*
Total Libellulidae	0	9	1	0	0	1	*1*	0	0	0	0	*0*
Cataclysta lemnata (L.)	2	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Pyralidae	2	0	0	0	0	0	*0*	0	0	0	0	*0*
Sialis lutaria (L.)	0	0	10	0	0	5	*5*	0	0	0	0	*0*
Total Sialidae	0	0	10	0	0	5	*5*	0	0	0	0	*0*
Anisosticta novemdecimpunctata (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Coccinellidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Dryops luridus (Erichson)	0	0	0	0	1	3	*4*	0	0	0	0	*0*
Total Dryopidae	0	0	0	0	1	3	*4*	0	0	0	0	*0*
Acilius sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Agabus bipustulatus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Agabus conspersus (Marsham)	0	0	0	1	0	0	*1*	0	0	0	0	*0*
Agabus didymus (Olivier)	0	1	0	0	0	0	*0*	0	0	0	0	*0*
Agabus nebulosus (Forster)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Agabus sturmii (Gyllenhal)	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Agabus/Ilybius larvae	0	18	13	0	0	0	*0*	0	3	0	0	*3*
Colymbetes fuscus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Colymbetinae group	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Dytiscus sp.	0	0	1	0	0	6	*6*	0	0	0	0	*0*
Graphoderus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Graptodytes bilineatus (Sturm)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Graptodytes pictus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	2	*2*
Hydroglyphus geminus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydroporus angustatus, Sturm	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydroporus erythrocephalus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydroporus incognitus, Sharp	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydroporus palustris (L.)	0	11	1	0	0	0	*0*	0	0	0	0	*0*
Hydroporus planus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydroporus sp.	0	0	6	0	0	0	*0*	0	0	0	0	*0*
Hygrotus impressopunctatus (Schaller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hygrotus inaequalis (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hygrotus parallelogrammus (Ahrens)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hygrotus versicolor (Schaller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hyphydrus ovatus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Ilybius ater (De Geer)	1	0	0	0	0	0	*0*	0	0	0	0	*0*
Ilybius fuliginosus (Fabricius)	0	6	0	0	0	1	*1*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Laccophilus hyalinus (De Geer)	0	0	0	0	0	0	*0*	0	0	0	1	*1*
Laccophilus minutus (L.)	0	0	1	0	4	3	*7*	0	0	0	0	*0*
Laccophilus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Rhantus frontalis (Marsham)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Rhantus suturalis (MacLeay)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Rhantus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Dytiscidae	1	36	23	1	4	10	*15*	0	3	0	3	*6*
Oulimnius tuberculatus (Müller)	1	0	**0**	0	0	0	*0*	0	0	0	0	*0*
Total Elmidae	1	0	0	0	0	0	*0*	0	0	0	0	*0*
Gyrinus caspius, Ménétriés	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Gyrinus paykulli, Ochs	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Gyrinus substriatus, Stephens	0	1	0	0	0	0	*0*	0	0	0	0	*0*
Gyrinus sp.	0	6	1	0	0	0	*0*	0	0	0	0	*0*
Total Gyrinidae	0	7	1	0	0	0	*0*	0	0	0	0	*0*
Haliplus apicalis, Thomson	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Haliplus immaculatus, Gerhardt	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Haliplus lineaticollis (Marsham)	0	1	0	0	0	0	*0*	0	0	0	0	*0*
Haliplus obliquus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Haliplus ruficollis (DeGeer)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Haliplus ruficollis group	0	0	1	1	0	0	*1*	0	0	0	0	*0*
Haliplus sibiricus, Motschulsky	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Haliplus sp.	0	4	0	0	0	0	*0*	0	0	0	0	*0*
Peltodytes caesus (Duftschmid)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Haliplidae	0	5	1	1	1	0	*2*	0	0	0	0	*0*
Helophorus aequalis, Thomson	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Helophorus alternans, Gené	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Helophorus brevipalpis, Bedel	0	0	4	0	16	14	*30*	0	0	0	0	*0*
Helophorus grandis, Illiger	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Helophorus griseus, Herbst	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Helophorus minutus, Fabricius	0	1	0	1	0	0	*1*	2	0	1	0	*3*
Helophorus obscurus, Mulsant	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Helophorus sp.	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Total Helophoridae	0	1	7	1	16	15	*32*	2	0	1	0	*3*
Heterocerus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Heteroceridae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Ochthebius dilatatus, Stephens	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Ochthebius minimus (Fabricius)	0	0	0	1	2	0	*3*	0	0	0	0	*0*
Ochthebius viridus, Peyron	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Hydraenidae	0	0	0	1	2	0	*3*	0	0	0	0	*0*
Hydrochus ignicollis (Motschulsky)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Hydrochidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Anacaena bipustulata (Marsham)	0	1	0	0	0	4	*4*	0	0	0	0	*0*
Anacaena limbata (Fabricius)	3	5	13	1	0	3	*4*	0	0	0	2	*2*
Anacaena sp.	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Berosus affinis (Brullé)	0	0	0	0	0	0	*0*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Berosus luridus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Berosus signaticollis (Charpentier)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Berosus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Cercyon sternalis (Sharp)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Cercyon tristis (Illiger)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Cymbiodyta marginellus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Enochrus halophilus (Bedel)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Enochrus testaceus (Fabricius)	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Enochrus sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Helochares lividus (Forster)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydrobius fuscipes (L.)	1	0	1	1	1	0	*2*	0	0	0	0	*0*
Hydrophilus piceus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Laccobius bipunctatus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Laccobius colon (Stephens)	0	0	0	6	2	5	*13*	0	0	0	0	*0*
Laccobius minutus (L.)	0	0	0	0	0	2	*2*	0	0	0	0	*0*
Laccobius sp.	0	0	0	6	0	0	*6*	0	0	0	0	*0*
Megasternum concinnum (Marsham)	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Hydrophilidae indet.	0	12	25	0	0	0	*0*	0	0	0	0	*0*
Total Hydrophilidae	4	18	39	14	5	15	*34*	0	0	0	2	*2*
Noterus clavicornis, De Geer	0	0	**0**	0	0	0	*0*	0	0	0	0	*0*
Noterus sp.	0	0	**0**	2	0	0	*2*	0	0	0	0	*0*
Total Noteridae	0	0	0	2	0	0	*2*	0	0	0	0	*0*
Hygrobia hermanni (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Paelobiidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Cyphon sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Elodes sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hydrocyphon sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Scirtes sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Scirtidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Arctocorisa germari (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Callicorixa praeusta (Fieber)	0	0	0	2	0	0	*2*	0	0	0	4	*4*
Callicorixa sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Corixa affinis/dentipes	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Corixa affinis/panzeri	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Corixa punctata (Illiger)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Corixa punctata/iberica	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Corixa sp.	0	16	0	0	0	0	*0*	0	0	0	15	*15*
Cymatia coleoptrata (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Cymatia sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hesperocorixa linnaei (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hesperocorixa moesta (Fieber)	1	0	0	0	0	0	*0*	0	0	0	0	*0*
Hesperocorixa sahlbergi (Fieber)	0	0	0	0	0	0	*0*	0	2	0	0	*2*
Hesperocorixa sp.	0	0	0	0	0	0	*0*	0	0	0	81	*81*
Miconecta scholtzi (Fieber)	0	0	0	0	0	3	*3*	0	71	41	73	*185*
Micronecta sp.	0	0	0	0	0	0	*0*	0	98	83	320	*501*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Paracorixa concinna (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara distincta/falleni/fallenoidea	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara dorsalis (Leach)	0	0	0	0	0	0	*0*	0	0	0	18	*18*
Sigara dorsalis/striata	0	0	0	0	0	0	*0*	1	0	0	7	*8*
Sigara falleni (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara falleni/iactans	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara fossarum (Leach)	0	0	0	0	0	0	*0*	0	0	0	5	*5*
Sigara iactans, Jansson	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara lateralis (Leach)	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Sigara limitata (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara nigrolineata (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara selecta (Fieber)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Sigara sp.	0	14	0	5	0	0	*5*	0	8	0	72	*80*
Corixidae indet.	0	0	0	0	0	0	*0*	0	10	0	0	*10*
Total Corixidae	1	30	0	7	1	3	*11*	1	189	124	595	*909*
Gerris lacustris (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Gerris group	0	0	2	0	19	0	*19*	0	0	0	0	*0*
Total Gerridae	0	0	2	0	19	0	*19*	0	0	0	0	*0*
Hydrometra stagnorum (L.)	0	1	1	0	0	0	*0*	0	0	0	0	*0*
Total Hydrometridae	0	1	1	0	0	0	*0*	0	0	0	0	*0*
Ilyocoris cimicoides (L.)	0	0	0	0	32	68	*100*	0	0	0	23	*23*
Ilyocoris cimicoides /Naucoris maculatus	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Naucoridae	0	0	0	0	32	68	*100*	0	0	0	23	*23*
Renatra linearis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Nepidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Notonecta glauca, L.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Notonecta sp.	34	0	0	7	0	21	*28*	0	0	44	28	*72*
Total Notonectidae	34	0	0	7	0	21	*28*	0	0	44	28	*72*
Plea minutissima, Leach	0	0	0	0	0	79	*79*	1	0	55	53	*109*
Total Pleidae	0	0	0	0	0	79	*79*	1	0	55	53	*109*
Microvelia reticulata (Burmeister)	0	0	1	0	72	2	*74*	0	0	0	0	*0*
Microvelia sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Velia caprai, Tamanini	0	12	0	0	0	0	*0*	0	0	0	0	*0*
Velia sp.	0	8	6	0	0	0	*0*	0	0	0	0	*0*
Total Veliidae	0	20	7	0	72	2	*74*	0	0	0	0	*0*
Saldula sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Saldidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Asellus aquaticus (L.)	482	166	71	230	91	86	*407*	0	0	0	0	*0*
Total Asellidae	482	166	71	230	91	86	*407*	0	0	0	0	*0*
Total Cladocera [1]	0	0	0	0	1000	1000	*2000*	0	0	111	0	*111*
Total Copepoda	0	0	0	0	440	0	*440*	0	0	21	0	*21*
Crangonyx pseudogracilis, Bousfield	63	0	1	0	4	51	*55*	0	0	0	0	*0*
Total Crangonyctidae	63	0	1	0	4	51	*55*	0	0	0	0	*0*
Gammarus duebeni, Liljeborg	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Gammarus zaddachi, Sexton	0	0	0	0	0	0	*0*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Gammarus sp.	0	0	0	0	10	0	*10*	0	0	0	0	*0*
Total Gammaridae	0	0	0	0	10	0	*10*	0	0	0	0	*0*
Total Ostracoda	0	0	4	0	0	0	*0*	0	0	0	0	*0*
Bithynia tentaculata (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Bithyniidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Potamopyrgus antipodarum (Gray)	0	0	0	0	0	12	*12*	0	0	0	0	*0*
Total Hydrobiidae	0	0	0	0	0	12	*12*	0	0	0	0	*0*
Galba truncatula (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Lymnaea stagnalis (L.)	0	0	0	4	58	8	*70*	0	0	0	0	*0*
Radix balthica (L.)	188	196	24	4	220	73	*297*	0	0	0	52	*52*
Stagnicola fuscus agg. (Pfeiffer)	0	0	3	0	0	0	*0*	0	0	0	0	*0*
Total Lymnaeidae	188	196	27	8	278	81	*367*	0	0	0	52	*52*
Physa group	0	82	20	0	86	61	*147*	10	6	13	109	*138*
Total Physidae	0	82	20	0	86	61	*147*	10	6	13	109	*138*
Anisus leucostoma (Millet)	0	0	0	0	0	0	*0*	1	0	0	0	*1*
Anisus vortex (L.)	0	0	0	0	0	0	*0*	0	0	0	1	*1*
Planorbarius corneus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Planorbis planorbis (L.)	19	73	0	0	0	58	*58*	0	0	0	0	*0*
Planorbis sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Gyraulus albus (Müller)	0	0	0	18	116	171	*305*	0	0	0	0	*0*
Gyraulus crista (L.)	0	0	0	120	146	80	*346*	0	0	0	0	*0*
Hippeutis complanatus (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Planorbidae indet.	15	6	0	0	0	0	*0*	0	0	0	0	*0*
Total Planorbidae	34	79	0	138	262	309	*709*	1	0	0	1	*2*
Pisidium casertanum (Poli)	0	0	7	0	0	0	*0*	0	0	0	0	*0*
Pisidium spp.	0	5	1	0	0	4	*4*	0	0	0	0	*0*
Musculium lacustre (Müller)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Sphaeriidae	0	5	8	0	0	4	*4*	0	0	0	0	*0*
Oxyloma elegans (Rossmässler)	0	0	2	0	0	0	*0*	0	0	0	0	*0*
Oxyloma sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Succineidae	0	0	2	0	0	0	*0*	0	0	0	0	*0*
Valvata cristata, Müller	0	0	0	0	0	0	*0*	1	0	0	0	*1*
Total Valvatidae	0	0	0	0	0	0	*0*	1	0	0	0	*1*
Total Ceratopogonidae	3	0	2	5	0	2	*7*	0	0	0	0	*0*
Chaoborus crystallinus (DeGeer)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Chaoborus flavicans (Meigen)	0	0	0	18	0	0	*18*	23	0	9	0	*32*
Chaoborus sp.	0	0	0	0	0	0	*0*	14	0	0	0	*14*
Total Chaoboridae	0	0	0	18	0	0	*18*	37	0	9	0	*46*
Total Chironomidae [1]	286	168	2200	1000	1000	186	*2186*	18	52	51	54	*175*
Anopheles claviger (Meigen)	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Anopheles sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Culiseta alaskaensis/annulata	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Culiseta alaskaensis/annulata/subochrea	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Culisita sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Culex pipiens, L	0	0	0	0	0	0	*0*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Culex sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Culicidae indet.	0	0	0	0	0	9	*9*	0	12	0	0	*12*
Total Culicidae	0	0	1	0	0	9	*9*	0	12	0	0	*12*
Dixa dilatata, Stobl	0	0	0	0	0	0	*0*	0	0	1	0	*1*
Dixa nebulosa, Meigen	0	0	4	0	0	0	*0*	0	0	0	0	*0*
Dixa sp.	1	0	0	0	0	1	*1*	0	0	0	0	*0*
Dixella aestivalis (Meigen)	0	0	0	2	0	0	*2*	0	5	0	0	*5*
Dixella autumnalis (Meigen)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Dixidae	1	0	4	2	0	1	*3*	0	5	1	0	*6*
Total Dolichopodidae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Ephydridae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Limoniidae	0	0	0	0	0	1	*1*	0	0	0	0	*0*
Total Muscidae	1	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Psychodidae	8	0	1	12	0	0	*12*	0	0	0	0	*0*
Total Ptychopteridae	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Sciomyzidae	5	3	0	0	0	1	*1*	0	0	0	1	*1*
Odontomyia sp.	0	1	0	0	0	0	*0*	0	0	0	0	*0*
Oplodontha viridula (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Oxycera rara (Scopoli)	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Oxycera nigricornis, Olivier	0	0	1	0	0	0	*0*	0	0	0	0	*0*
Stratiomys singularior (Harris)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Stratiomys sp.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Stratiomyidae indet.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Stratiomyidae	0	1	2	0	0	0	*0*	0	0	0	0	*0*
Total Syrphidae	0	0	4	0	0	0	*0*	0	0	0	0	*0*
Total Tipulidae	0	0	0	0	0	3	*3*	0	1	0	0	*1*
Alboglossiphonia heteroclita (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Helobdella stagnalis (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Hemiclepsis marginata (Müller)	0	0	0	0	1	0	*1*	0	0	0	0	*0*
Thermomyzon tessulatum (Müller)	1	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Glossiphoniidae	1	0	0	0	1	0	*1*	0	0	0	0	*0*
Dendrocoelum lacteum (Müller)	4	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Dendrocoelidae	4	0	0	0	0	0	*0*	0	0	0	0	*0*
Dugesia polychroa group	87	17	1	11	17	380	*408*	0	0	0	80	*80*
Total Dugesiidae	87	17	1	11	17	380	*408*	0	0	0	80	*80*
Polycelis nigra group	42	80	42	0	41	540	*581*	0	0	0	130	*130*
Total Planariidae	42	80	42	0	41	540	*581*	0	0	0	130	*130*
Unidentified Tricladida	0	0	4	0	0	0	*0*	0	0	0	0	*0*
Total Oligochaeta	16	51	9	0	5	4	*9*	1	0	0	15	*16*
Total Collembola	0	0	33	0	74	0	*74*	0	0	0	0	*0*
Total Hydracarina	0	34	57	71	72	92	*235*	0	0	0	41	*41*
Total Nematoda	0	72	0	0	0	0	*0*	0	0	0	0	*0*
Total Hydrozoa	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Terrestrial species recorded:												
Bembidion sp.	0	0	0	1	0	0	*1*	0	0	0	0	*0*

Taxon	ES1	ES2	ES3	BP1	BP2	BP3	*BP*	BPP1	BPP2	BPP3	BPP4	*BPP*
Demetrias imperialis, Germar	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Odacantha melanura (L.)	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Carabidae	0	0	0	1	0	0	*1*	0	0	0	0	*0*
Cassida viridis, L.	0	1	0	0	0	0	*0*	0	0	0	0	*0*
Galerucella sp.	0	0	0	0	0	0	*0*	2	0	0	0	*2*
Chrysomelidae indet.	0	0	0	0	0	0	*0*	0	0	0	0	*0*
Total Chrysomelidae	0	1	0	0	0	0	*0*	2	0	0	0	*2*
Total Staphylinidae	0	3	0	0	0	0	*0*	1	0	0	0	*1*

Note: Abundances are provided for each sub-sample, where applicable; data for compounded samples (representing entire waterbody) are provided in italics.

[1] An abundance of 1000 indicates an abundance of >1000.
Where appropriate, abundances of certain taxa (Mollusc species and Chironomidae) have been estimated from a sub-sample.

Appendix 3 Table 2: Adult dragonflies and damselflies recorded during the aquatic macroinvertebrate surveys.

Common Name	**Taxon**	**Sites**
Azure Damselfly	*Coenagrion puella*	BM3, SM1, ES2
Blue-tailed Damselfly	*Ischnura elegans*	NP, BDM-N-1, P5
Common Blue Damselfly	*Enallagma cyathigerum*	P5, BPP
Broad-bodied Chaser	*Libellula depressa*	BM3, NP
Brown Hawker	*Aeshna grandis*	BDM-W-4
Hairy Dragonfly	*Brachytron pratense*	P6-N, P6-S

Appendix 3 Table 3: Incidental records of fish and amphibians whilst surveying for aquatic macroinvertebrates. P indicates present in sample (no abundance data) otherwise numbers refer to abundances recorded in a sample.

Site	*Gasterosteus aculeatus* 3-spined Stickleback	*Pungitius pungitius* 9-spined Stickleback	Fish fry	*Lissotriton vulgaris/ L. helveticus* larvae Smooth/ Palmate newt	*Lissotriton vulgaris/ L. helveticus* eggs Smooth/ Palmate newt	Frog tadpoles
BM1						
BM2		1				
BM3	15	31	36	15		
BM4				23		
NP1	P					
NP2	P		P	P [1]		
SM1				P [1]		
SM2				P [1]		
SM3	P					
SM4						
SM5	P		P			
BDM-W-1						
BDM-W-2						
BDM-W-3						
BDM-W-4	P			P [1]		
BDM-W-5						
BDM-W-6				P [1]		
BDM-N-1				22	56	
BDM-N-2				54	11	
BDM-N-3				1		
P3-1						
P3-2						
P5a		2	2			
P5b	1		7	2		
P6-N-1	P					
P6-N-2				P [1]		
P6-N-3						
P6-S-1			P			
P6-S-2	P	P				
P6-S-3	P		P	P [1]		
P6-S-4		P	P			
ES1	P					
ES2	P					
ES3	1	18	29	P		P
BP1	P					
BP2						
BP3						
BPP1				P [1]		P
BPP2						
BPP3						
BPP4			P	P [1]		

[1] Indicates larvae identified as *Lissotriton vulgaris*

Appendix 3 Table 4: Aquatic and wetland macrophytes found in and around the various waterbodies. P indicates present within the waterbody.

Part 1 – Ditch sites on Swanscombe peninsula.

Growth habit	Taxa	Common name	BM1	BM2	BM3	BM4	SM1	SM2	SM3	SM4	SM5
Emergent	*Alisma plantago-aquatica*	Water-plantain									
	Apium nodiflorum	Fool's Watercress									
	Bolboschoenus maritimus	Sea Club-rush									
	Carex otrubae	False Fox Sedge									
	Carex sp.	Sedge			P						
	Eleocharis palustris	Common Spike-rush									
	Epilobium hirsutum	Great Willowherb									
	Epilobium sp.	Willowherb					P			P	
	Heracleum mantegazzianum	Giant Hogweed									
	Iris pseudacorus	Yellow Flag Iris									
	Juncus articulatus	Jointed Rush									
	Juncus inflexus	Hard Rush									
	Juncus sp.	Rush									
	Lycopus europaeus	Gipsywort									
	Mentha aquatica	Water Mint									
	Oenanthe crocata	Hemlock Water Dropwort									
	Phragmites australis	Common Reed	P	P			P	P	P	P	P
	Rorippa nasturtium-aquaticum	Watercress									
	Rubus fruticosus agg.	Brambles		P	P					P	
	Rumex sp.	Dock									
	Salix sp.	Willow					P				
	Schoenoplectus tabermaemontani	Grey Club-rush									
	Scrophularia auriculata	Water Figwort									
	Solanum dolcamara	Bittersweet		P							
	Typha angustifolia	Lesser Reedmace									
	Typha latifolia	Common Reedmace									
	Veronica catenata	Pink Water-speedwell									
	Veronica sp.	Water Speedwell									
Floating	*Lemna minor*	Common Duckweed			P		P				
	Lemna trisulca	Ivy-leaved Duckweed					P				
	Nymphaea alba	White Water-lily									
Submerged	*Callitiche* sp.	Water Starwort									
	Chara vulgaris	Common Stonewort									
	Potamogeton berchtoldii	Small Pondweed									

Growth habit	Taxa	Common name	BM1	BM2	BM3	BM4	SM1	SM2	SM3	SM4	SM5
Submerged	*Potamogeton pusillus*	Lesser Pondweed									
	Ranunculus baudotii	Brackish Water-crowfoot			P						
Algae		Filamentous green algae		P	P	P	P	P			
		Phytoplankton									
	Spirogyra	Filamentous green algae									

Part 2 – Ponds and Ebbsfleet Stream.

Growth habit	Taxa	Common name	NP	BDM -W	BDM -N	P3	P5	P6-N	P6-S	BPP	BP	ES1	ES2	ES3
Emergent	*Alisma plantago-aquatica*	Water-plantain					P	P	P		P			
	Apium nodiflorum	Fool's Watercress											P	
	Bolboschoenus maritimus	Sea Club-rush		P	P			P						
	Carex otrubae	False Fox Sedge							P					
	Carex sp.	Sedge			P			P	P					
	Eleocharis palustris	Common Spike-rush						P	P					
	Epilobium hirsutum	Great Willowherb	P			P				P	P		P	P
	Epilobium sp.	Willowherb												
	Heracleum mantegazzianum	Giant Hogweed												P
	Iris pseudacorus	Yellow Flag Iris									P			P
	Juncus articulatus	Jointed Rush							P					
	Juncus inflexus	Hard Rush					P		P					
	Juncus sp.	Rush		P			P							
	Lycopus europaeus	Gipsywort					P			P	P			P
	Mentha aquatica	Water Mint								P				
	Oenanthe crocata	Hemlock Water Dropwort				P								
	Phragmites australis	Common Reed	P	P	P	P	P	P	P	P	P	P		P
	Rorippa nasturtium-aquaticum	Watercress											P	P
	Rubus fruticosus agg.	Brambles		P	P					P				P
	Rumex sp.	Dock					P				P			
	Salix sp.	Willow		P	P			P	P		P		P	P
	Schoenoplectus tabermaemontani	Grey Club-rush							P					
	Scrophularia auriculata	Water Figwort											P	
	Solanum dolcamara	Bittersweet				P			P	P				P
	Typha angustifolia	Lesser Reedmace							P					
	Typha latifolia	Common Reedmace	P	P			P	P	P		P			
	Veronica catenata	Pink Water-speedwell							P					

Growth habit	Taxa	Common name	NP	BDM-W	BDM-N	P3	P5	P6-N	P6-S	BPP	BP	ES1	ES2	ES3
Emergent	*Veronica* sp.	Water Speedwell								P				
Floating	*Lemna minor*	Common Duckweed		P	P								P	
	Lemna trisulca	Ivy-leaved Duckweed		P	P									
	Nymphaea alba	White Water-lily								P	P			
Submerged	*Callitiche* sp.	Water Starwort							P			P	P	P
	Chara vulgaris	Common Stonewort					P	P						
	Potamogeton berchtoldii	Small Pondweed		P					P					
	Potamogeton pusillus	Lesser Pondweed					P	P						
	Ranunculus baudotii	Brackish Water-crowfoot	P					P	P					
Algae		Filamentous green algae		P	P		P	P	P	P			P	P
		Phytoplankton	P											
	Spirogyra	Filamentous green algae			P		P							

Annex EDP 31
A targeted ecological survey of selected waterbodies and wetlands on the Swanscombe peninsula, Kent (Aseda, 2016)

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Aseda

Aquatic Surveying and
Environmental Data Analyses

A targeted ecological survey of selected waterbodies and wetlands on the Swanscombe peninsula, Kent

A report on behalf of Chris Blandford Associates

Issue 1
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Aseda 2016

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1 Introduction

1.1 General

An aquatic macroinvertebrate survey of waterbodies and wetlands on and around the Swanscombe peninsula was undertaken by Aseda on behalf of CBA between May and June 2015. Several taxonomic groups were under-represented in findings from these surveys; a result of the timing of the surveys in relation to the life cycle of the taxa. A targeted survey was undertaken in April 2016 from selected waterbodies on the peninsula. The aim of this further survey was to compile a more comprehensive species list of water beetles, aquatic bugs and dragonflies from selected waterbodies. This report details the methodology, results and evaluation of this survey; it is an adjunct to the original report and findings should be considered in conjunction with those from the 2015 survey.

1.2 Scope of the survey

The scope of the survey encompassed the following;

- to compile a more comprehensive taxonomic list of selected sections of the faunal assemblage from the most species-rich waterbodies on the peninsula;
- to evaluate the conservation value of the aquatic faunal assemblage using 2015 and 2016 survey data combined.

1.3 Survey limitations

The current survey draws its conclusions extrapolated from findings from a limited selection of the waterbodies within the area; sampling alternative waterbodies or sections of waterbody would inevitably yield different findings.

The targeted taxa are largely highly mobile species and as such readily evade capture; thus any taxonomic list, collated from only two surveys, is likely to represent a fraction of the true assemblage.

1.4 Summary & key findings

1. The Swanscombe peninsula consists of the eastern Botany Marsh and the western Swanscombe Marsh; the current survey focused on selected wetlands and waterbodies within Swanscombe Marsh. The two areas of wetland and associated ditch network in the west of the marsh (Black Duck Marsh – west and north) and a series of three ponds to the east, created as mitigation for the Channel Tunnel Rail Link, were re-investigated in the current survey.

2. The previous survey indicated the aquatic and wetland habitats on the peninsula to be of high conservation value. Findings from the current survey added to the previous list of species recorded both for the marsh as a whole and for individual waterbodies. A total of 212 species of aquatic macroinvertebrate were recorded in the two surveys combined. Amongst these, several species of conservation concern were recorded; one Vulnerable, three Near Threatened, 14 Nationally Scarce and 56 with a Local distribution within the UK.

3. The wetland and aquatic habitats of Black Duck Marsh supported 47 species of conservation interest; one Vulnerable, two Near Threatened, 10 Nationally Scarce and 34 Local. The three ponds supported one Near Threatened, eight Nationally Scarce and 32 Local species.

4. Water beetles were the most species-rich taxonomic order with a total of 84 species recorded from all surveyed sites. Water beetle assemblages typically represented up to one half of the species in a given waterbody; when considering the species of conservation interest, these accounted for up to three quarters of the species present. Aquatic bugs were the second most speciose order.
5. Swanscombe Marsh, on the basis of its water beetle assemblage, when compounding data from all surveyed waterbodies in both surveys, can be categorised as being a Good wetland site. Several uncommon species recorded show a high fidelity to coastal grazing marsh habitats.
6. Notable between-year variation in the abiotic and biotic habitats in both the wetlands and ponds were observed. These were reflected in substantial differences in the faunal assemblages of the selected waterbodies between the two surveys. Wetland and aquatic habitats in Black Duck Marsh typically supported a far more species-rich water beetle fauna in the current survey, relative to that recorded in the previous survey. A number of species found in the current survey were previously unrecorded from any of the surveyed sites; several were previously unrecorded within the particular habitat or waterbody, though found elsewhere on the peninsula. Of the three re-surveyed ponds, two ponds supported notably greater freshwater algal biomass than previously observed. The composition of the faunal assemblages in these two ponds were markedly different between the two surveys.
7. Abiotic and biotic habitat variability, both spatially and temporally, within this network of wetland and aquatic habitats across the peninsula provides an environment able to support a particularly species-rich macroinvertebrate assemblage. The interconnectedness of the various wetlands, ditches and ponds, physically and or hydrologically, is particularly important for this biodiversity. Individual waterbodies can be seen to enhance the regional diversity in addition to providing their own value.
8. Findings from the previous survey tentatively categorised Swanscombe and Botany Marshes as being at least of County value, if not Regional. The current survey supported this assessment.

2 Field sampling programme

2.1 Ponds survey

Pond survey methodology undertaken during the 2015 survey followed Freshwater Habitats Trust PSYM guidelines. Here the wetland and aquatic plant and aquatic macroinvertebrate assemblages are surveyed, along with the collection of selected environmental parameters. The aim of the current survey was, however, to target specific taxonomic groups only. The survey methodology was therefore adapted from these established protocols, as appropriate.

For each of the three ponds, a sample was collected where time was divided amongst each mesohabitat identified during the previous survey (examples of typical mesohabitats are stands of emergent *Carex* or flooded marginal grasses). Mesohabitats were sweep netted, hard surfaces lightly 'kick sampled'. Accessibility, soft sediments and waterbody size meant two of the three ponds were accessed by Canadian canoe. An additional search, for otherwise missed animals, was carried out; such as from the water surface.

Where appropriate, sweep nets, from individual mesohabitats, were washed into a bucket and gross plant material washed within the sample and then discarded; this process was then repeated

until the mesohabitat was thoroughly sampled. Samples were fixed in the field for laboratory sorting and identification.

Where appropriate and access permitted, however, individual sweep net hauls were bank sorted on a white polythene sheet. Here the contents from each net haul were spread out into a thin layer and the mobile targeted taxa were then collected. This process was repeated multiple times until the mesohabitat was thoroughly sampled. Bank sorting of material from selected mesohabitats meant that a larger area of habitat could be practically sampled, thus increasing the chances of individuals being captured. Bank sorting such as this is typically only suitable for collecting mobile taxa amongst large quantities of plant material. These sorted samples were fixed in the field for laboratory identification.

Sampling was carried out on the 20th and 21st April 2016; during the spring season as defined by Environment Agency guidelines.

2.2 Wetlands survey

As in the 2015 survey, aquatic habitats within Black Duck Marsh on the Swanscombe peninsula were treated as two areas of wetland, one in the west (BDM-W) and one in the north (BDM-N). The western section comprised a series of ditches and two flooded fields. At the time of sampling, some sections of ditch were identifiable as discrete waterbodies; others were contiguous with the flooded fields. The northern section comprised two principal interlinked stretches of ditch and a small adjacent area of wetland.

Within the wetland areas between three and six wetland mesohabitats were identified and netted, as described for the ponds. A Canadian canoe was used to access the various wetland habitats. Were possible netting was by wading and sweep netting or lightly kicking the substratum amongst the various mesohabitats; otherwise sampling was by sweep netting vegetative habitats from the canoe.

Multiple net hauls from each of the mesohabitats were either collected and fixed in the field for laboratory sorting and identification, or bank sorted and individuals fixed for laboratory identification, as described above for ponds.

Each of the sub-samples from the various mesohabitats were collected and analysed separately, then as a whole for each of the two wetland areas.

In addition to the sweep netting, bottle traps were set at several locations around the two wetlands, in an attempt to trap the large aquatic diving beetles which typically evade capture by netting. Bottle traps are clear plastic bottles with the upper third cut-off and inverted into the bottle. The traps are weighted as to float just beneath the water surface. These were positioned amongst marginal or submerged vegetation having first been baited with tinned fish. Traps were set early in the day and collected several hours later.

Sampling was carried out on the 20th April 2016; during the spring season as defined by Environment Agency guidelines.

Selected environmental and habitat variables were recorded for each wetland.

3 Site location

Surveyed waterbodies and wetlands were all located on the Swanscombe peninsula. The five survey waterbodies were chosen on the basis of being the most species-rich in the 2015 survey; they had the potential to yield maximum findings for a given survey effort.

The location of the sampling sites is provided in Table 1, Figure 1. Photographs of the sampling sites are provided in Appendix 1.

Table 1 Location of the survey sites.

Date	**Macroinvertebrate sample site** [1]	**Site code**	**NGR**[2]
20/04/16	Black Duck Marsh - West 1	BDM-W-1	TQ 59589 75374
20/04/16	Black Duck Marsh - West 2	BDM-W-2	TQ 59743 75469
20/04/16	Black Duck Marsh - West 3	BDM-W-3	TQ 59680 75389
20/04/16	Black Duck Marsh - West 4 (ditch D4)	BDM-W-4	TQ 59578 75354
20/04/16	Black Duck Marsh - West 5 (ditch D3)	BDM-W-5	TQ 59574 75331
20/04/16	Black Duck Marsh - West 6 (ditch D4)	BDM-W-6	TQ 59636 75480
20/04/16	Black Duck Marsh - North 1	BDM-N-1	TQ 59995 75700
20/04/16	Black Duck Marsh - North 2 (ditch D8)	BDM-N-2	TQ 60080 75541
20/04/16	Black Duck Marsh - North 3 (ditch D9)	BDM-N-3	TQ 60052 75721
21/04/16	Pond P5	P5	TQ 60503 75352
20/04/16	Pond P6 - North	P6-N	TQ 60618 75481
20/04/16	Pond P6 - South	P6-S	TQ 60563 75431

Notes:

[1] Original CBA ditch labelling is provided in parenthesis.

[2] NGR's refer to a single point within the sample site; the sample will have been taken over a wider area in the vicinity of this point.

NGR's have been provided for sub-sample locations within Black Duck Marsh as these cover a wide geographical area; a single NGR has been provided to represent each pond including the various sub-sample locations.

Waterbodies within the study area exhibited varying degrees of brackish influence, a consequence of their varying proximity to and hydrological connectivity with the neighbouring estuarine environment (Table 2). The level of brackish influence varied between the two surveys.

Table 2 Selected environmental variables for survey sites.

Site code	**Altitude** (m)	**pH**	**Conductivity** (µS cm^{-1}) Spring 2016	***Conductivity*** *(µS cm^{-1})* *Summer 2015*
BDM-W-1	3	7.8	2930	*3556*
BDM-W-2	1	8.2	3540	*3537*
BDM-W-3	2	7.7	3270	*3530*
BDM-W-4	5	7.5	4300	*3876*
BDM-W-5	6	7.5	1540	*3542*
BDM-W-6	1	7.6	4200	*3604*
BDM-N-1	2	7.9	4490	*3360*
BDM-N-2	2	7.8	4385	*3615*
BDM-N-3	2	7.8	4385	*3369*
P5	1	7.6	1266	*1005*
P6-N	0	8.1	2077	*2140*
P6-S	1	7.9	2076	*1042*

Notes:

Chemical parameters refer to values at time of sampling only.

Where conductivity is greater than 2000 µS cm^{-1} a waterbody is considered brackish.

Conductivity values for the summer 2015 survey have been provided in italics, for reference.

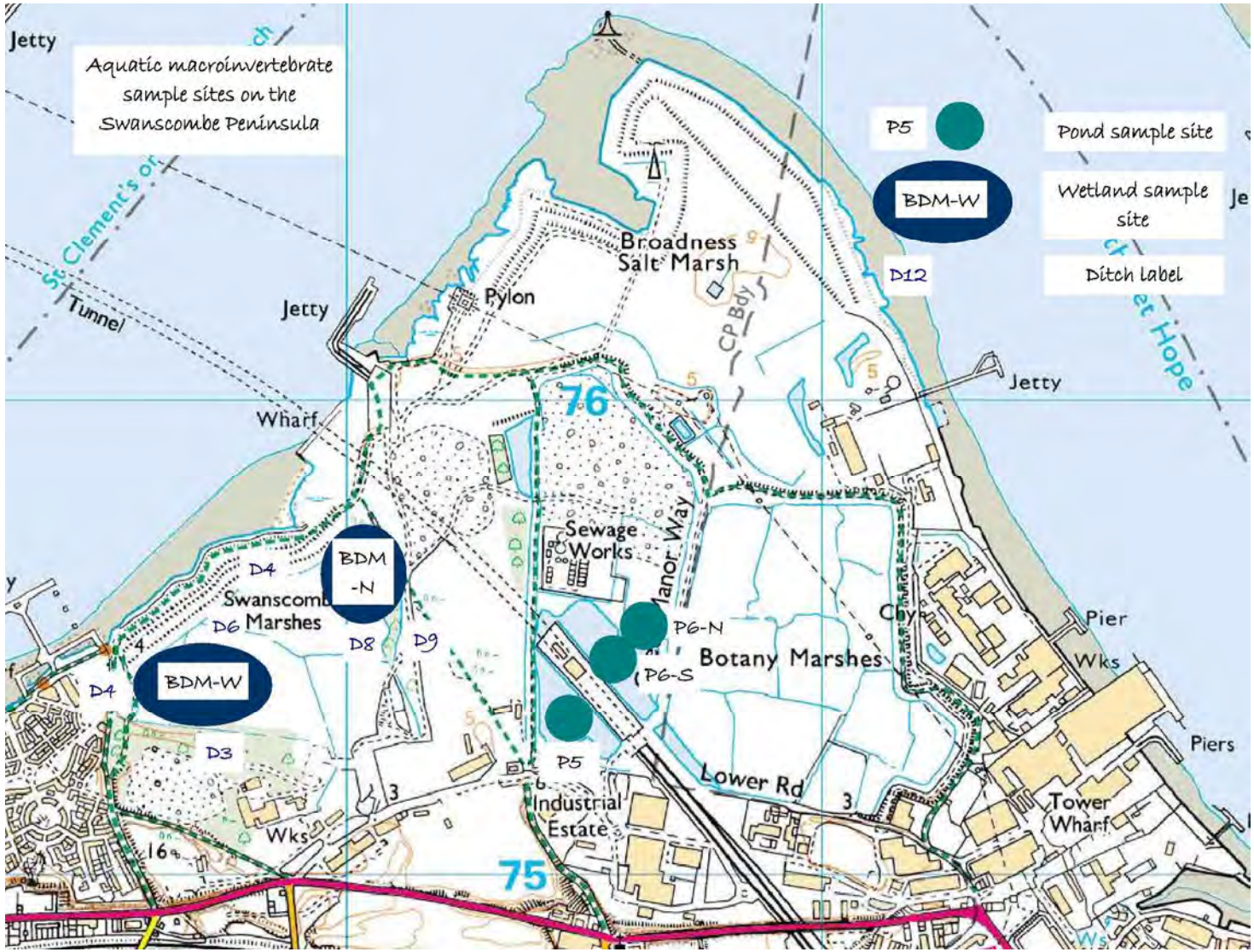

Figure 1 Location of aquatic macroinvertebrate sample sites (2016 survey)

Base map source: CBA

4 Analyses

4.1 Laboratory analyses

Macroinvertebrate samples were initially fixed in the field using 4% formaldehyde. Samples were analysed in the laboratory by both Aseda and GJ Robinson (GJ Robinson, Haltwhistle). Where un-sorted in the field, macroinvertebrates were laboratory sorted from plant material and detritus, by placing small amounts of sample in a white tray, immersing in water and removing and counting all invertebrate taxa. This was repeated until the entire sample had been sorted. Sorted specimens were preserved in 70 % industrial methylated spirits.

Targeted taxonomic groups (water beetles, aquatic bugs, damselflies and dragonflies) were identified to the highest taxonomic level practical. A lack of taxonomic information renders specific identification of a number of taxa unfeasible; for example, the larvae of aquatic bugs, dragonflies and damselflies, and the larvae and females of some water beetles. These taxa were therefore identified as far as reliably attainable. Other taxonomic groups were identified to genus or family. Identification keys and atlases used are provided in the reference section.

Where invertebrates were present as incomplete specimens, only the portions, which had a head and a thorax or a thorax and abdomen, were included in the relative abundances (Environment Agency and Institute of Freshwater Ecology, 1997).

4.2 Data analysis

Macroinvertebrate abundance data were investigated in terms of conservation assessment and taxonomic richness.

4.2.1 Conservation assessment

The conservation value of a species is described according to its perceived vulnerability and geographical distribution within the U.K.

Revised definitions and criteria (IUCN, 2001) for assigning the conservation status to a species are based on qualifying thresholds within a set of six criteria (rapid decline; small, fragmented, declining or fluctuating range; small or declining population; very small population; very small area of occupancy; and quantifiable probability of extinction).

Revised categories are adapted from the Red Data List system initiated by the IUCN in 1966. New categories include *Extinct in the Wild* and *Critically Endangered*; whilst *Endangered* and *Vulnerable* are maintained albeit defined differently; those defined as *Rare* in the old system are typically assigned to the new category *Near Threatened*. *Nationally Scarce* is a status particular to the UK.

The conservation status assigned to a species is typically based on data from a collection of published lists, reviews and atlases. Analyses using status values to assign a value to a site, such as that used by Chadd and Extence (2004), generally use the original IUCN categories in assigning a species conservation score (e.g., those published in Shirt, 1987). Recently published lists and reviews using the revised IUCN guidelines include a review of scarce and threatened water beetles (Foster, 2010) and Odonata (Daguet *et al*, 2008). In the following discussion of conservation value, where a species status has been revised, its status score has been adjusted accordingly.

Rarity, threat and protected status categories used for invertebrates (both original and revised) are as follows:

HD	Listed in Annexes IIa and /or IVa of the EC Habitats Directive (and/or Appendix II of the Bern Convention) and covered by the Conservation of Habitats and Species Regulations 2010
Sch5	Included in Schedule 5 of the Wildlife and Countryside Act, 1981
EX	Extinct
EW	Extinct in the Wild
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
LC	Least Concern
DD	Data Deficient – insufficient information to ascertain Red List status
NE	Not Evaluated
E	British Red List: Endangered (RDB 1)
V	British Red List: Vulnerable (RDB 2)
R	British Red List: Rare (RDB 3)
K	British Red List: Insufficiently known but may qualify for red list status (RDB K)
GVU	Vulnerable on the IUCN Global Red List
GNT	Globally Near Threatened (IUCN)
BAP	UK Biodiversity Action Plan priority species
NS	Restricted Range: Nationally Scarce – occurring as native in 16 to 100 x 10 km squares in Britain (a replacement for Na and Nb)
Na	Restricted Range: Notable a – occurring in 16 to 30 10 x 10 km squares in Britain
Nb	Restricted Range: Notable b – occurring in 31 to 100 10 x 10 km squares in Britain
Local	Confined to a particular habitat or geographic area, or too widespread to warrant Nationally Scarce status but infrequently encountered.
Common	Species not listed in any of the above categories.

Findings from the 2015 survey categorised each of the waterbodies, re-surveyed in the current survey, as being of High or Very High conservation value, using the Community Conservation Index (Chadd and Extence, 2004). This index assesses the overall conservation value of the macroinvertebrate assemblages on the basis of both rarity and richness of taxa (methodology described fully in Aseda, 2016a). Given the targeted nature of the current survey, it was neither appropriate nor necessary to repeat these analyses.

Each of the three ponds surveyed in the current survey attained at least one of the criteria required for Priority Pond Status; a pond only needs to meet one of these criteria to be classified as a Priority Pond (Fairclough and Nicolet, 2008; methodology described fully in Aseda, 2016a). The ponds were not re-assessed using the current survey data.

4.2.2 Taxonomic richness

In the following discussion, the surveyed habitats are described in terms of the species richness of the entire aquatic assemblage and the targeted taxonomic groups.

Where appropriate richness values for targeted groups has been compared to findings from the previous survey. Values for the two surveys have then been combined to provide a compounded richness value for the habitat or waterbody.

4.2.3 Determination of site importance

There are no published criteria upon which to base an evaluation of the conservation importance of the macroinvertebrate faunal assemblages of aquatic habitats.

Nevertheless, on the basis of findings from the previous survey, a tentative conservation value was assigned to the wetland and aquatic habitats within the survey area; this was based on a combination of species richness and rarity metrics, selected from published material (Aseda, 2016a).

This original assessment was reviewed in the light of new data from the current survey.

5 Ecological quality of the waterbodies in the survey area

Photographs of the survey sites are provided in Appendix 1. Sketch maps of the waterbodies illustrating the various mesohabitats and the principal areas of wetland and aquatic flora are provided in Appendix 2. A full list of the aquatic macroinvertebrates recorded in both the previous and current surveys, for the five re-surveyed waterbodies, is provided in Appendix 3.

Within the following discussion the fauna recorded in the various wetlands and ponds has been described for each of the sub-sampling stations separately, representing the various mesohabitats within the waterbodies. The objective of this approach was to more fully understand the relationship between the fauna and habitat. This approach is directly comparable to that described for the previous survey (Aseda, 2016a).

The overall species-richness and conservation value of each waterbody has then been assessed using data from each of these mesohabitats combined. This approach allows a direct comparison amongst the different waterbodies.

Table 3 Species of conservation interest recorded from the survey sites; 2015 and 2016 data combined.

Species recorded in the current survey, unrecorded in any of the surveyed habitats in 2015 are highlighted in blue, for clarity. Where a species has been found in a habitat where it was previously unrecorded it has been added in blue text in a separate column.

Species	Common name	Status	Site/s 2015 or 2015 & 2016	New sites in 2016
Graphoderus sp. [1]	Diving Beetle	VU	BDM-W, BDM-N	
Hydrochus ignicollis	Water Beetle	NT	SM1, SM2, SM4, SM5, BDM-N	
Berosus luridus	Water Beetle	NT	NP	
Hydrophilus piceus	Great Silver Diving Beetle	NT	BDM-W, P5	
Agabus conspersus	Diving Beetle	NS	BP	
Graptodytes bilineatus	Diving Beetle	NS	BM1	BDM-W, P5
Hydrovatus cuspidatus	Water Beetle	NS		BDM-W
Hygrotus parallelogrammus	Diving Beetle	NS	NP	
Rhantus frontalis	Diving Beetle	NS	SM5, BDM-W, BDM-N	P5
Gyrinus paykulli	Whirligig Beetle	NS	SM4, BDM-W, BDM-N	P5
Haliplus apicalis	Crawling Water Beetle	NS	BDM-W	P5
Peltodytes caesus	Crawling Water Beetle	NS	BDM-W, BDM-N, P5, P6-N	
Helophorus alternans	Water Beetle	NS	BM1, BM3, BM4, NP, SM2, P5, P6-S, ES3	
Helophorus nanus	Water Beetle	NS		P6-N
Ochthebius viridus	Water Beetle	NS	BM2, BDM-N, P5	BDM-W
Enochrus bicolor	Water Beetle	NS		BDM-W
Enochrus halophilus	Water Beetle	NS	BM3, SM2, BDM-N	BDM-W
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N	
Cyrnus flavidus	Caddisfly	Local	BP, BPP	
Oecetis furva	Caddisfly	Local	BDM-N	
Caenis luctuosa	Mayfly	Local	BDM-N, ES1, ES2	
Caenis robusta	Mayfly	Local	BDM-N, P6-N, P6-S	
Aeshna mixta	Migrant Hawker - Dragonfly	Local	P5	
Brachytron pratense	Hairy Dragonfly	Local	P6-N, P6-S	
Acilius sp. [2]	Lesser Diving Beetle	Local	BDM-N	
Agabus didymus	Diving Beetle	Local	ES2	
Dytiscus circumflexus	Diving Beetle; The Wasp	Local		BDM-N

Species	Common name	Status	Site/s	New sites in 2016
Graptodytes pictus	Diving Beetle	Local	SM4	
Hydroglyphus geminus	Diving Beetle	Local	NP	
Hygrotus impressopunctatus	Diving Beetle	Local	BM1, SM2, SM5, BDM-W, P6-S	P5
Hygrotus versicolor	Diving Beetle	Local	SM4, BDM-W	
Laccophilus hyalinus	Diving Beetle	Local	BPP	BDM-W, P5
Liopterus haemorrhoidalis	Diving Beetle; The Piles Beetle	Local		BDM-W, P5
Rhantus suturalis	Diving Beetle	Local	BM3, BDM-W	BDM-N, P5, P6-S
Gyrinus caspius	Whirligig Beetle	Local	SM4, P3	BDM-W
Haliplus obliquus	Crawling Water Beetle	Local	SM1	
Helophorus griseus	Water Beetle	Local	NP, SM5, P5, P6-N	
Hydraena testacea	Water Beetle	Local		P6-N
Ochthebius dilatatus	Water Beetle	Local	BM1, BM2, SM2	
Ochthebius marinus	Water Beetle	Local		BDM-W
Anacaena bipustulata	Water Beetle	Local	SM1, SM5, BDM-N, ES2	
Berosus affinis	Water Beetle	Local	BM3, NP, P5, P6-N, P6-S	BDM-W, BDM-N
Berosus signaticollis	Water Beetle	Local	NP, P6-N	BDM-W, P5, P6-S
Cercyon sternalis	Water Beetle	Local	BM1, SM5	BDM-N, P6-N
Cercyon tristis	Water Beetle	Local	BM1, BDM-W, P6-S	
Cymbiodyta marginellus	Water Beetle	Local	BM1, SM1, SM2, SM4, SM5	BDM-W, P5
Enochrus testaceus	Water Beetle	Local	BDM-N, P3	BDM-W, P5
Helochares lividus	Water Beetle	Local	NP, SM1	BDM-N, P5
Laccobius colon	Water Beetle	Local	NP	BDM-N, P5
Hygrobia hermanni	The Squeak Beetle	Local	P5	BDM-N
Anisosticta novemdecimpunctata	The Water Ladybird	Local	P6-N	BDM-N
Arctocorisa germari	Aquatic Bug	Local	P6-N	
Corixa affinis	Aquatic Bug	Local	SM3[3], BDM-W[3], P6-N[3], P6-S[3]	P6-N, P6-S
Cymatia coleoptrata	Aquatic Bug	Local	BDM-W, P5, P6-S	
Hesperocorixa moesta	Aquatic Bug	Local	ES1	
Micronecta scholtzi	Aquatic Bug	Local	SM4, P6-S	
Paracorixa concinna	Aquatic Bug	Local	BDM-W, BDM-N, P6-N	P6-S
Sigara iactans	Aquatic Bug	Local	NP, P6-N, P6-S	
Sigara limitata	Aquatic Bug	Local	P6-N	

Species	Common name	Status	Site/s	New sites in 2016
Sigara selecta	Aquatic Bug	Local	P6-S	
Renatra linearis	Water Stick Insect	Local	P5, P6-N	
Microvelia reticulata	Aquatic Bug	Local	SM4, BDM-W, BDM-N, P3, P6-N, P6-S	P5
Anisus leucostoma	White-lipped Ram's-horn Snail	Local	BPP	
Gyraulus albus	White Ram's-horn Snail	Local	BDM-W, P6-S, BP	
Hippeutis complanatus	Flat Ram's-horn Snail	Local	SM1, BDM-W, P6-N	BDM-N
Valvata cristata	Flat Valve Snail	Local	BDM-W, BPP	
Chaoborus crystallinus	Phantom Midge	Local	SM1, SM4, SM5	BDM-N
Dixa dilatata	Meniscus Midge	Local	BPP	
Dixella autumnalis	Meniscus Midge	Local	BM2, BDM-N	
Oplodontha viridula	Common Green Colonel – Soldierfly	Local	BDM-N, P5	
Oxycera rara	Four-barred Major - Soldierfly	Local	ES3	
Oxycera nigricornis	Delicate Soldier - Soldierfly	Local	ES3	
Alboglossiphonia heteroclita	Leech	Local	NP	
Hemiclepsis marginata	Leech	Local	BP	

[1] *Graphoderus* sp. larvae; larvae unidentifiable to species. Only likely to be *Graphoderus cinereus* (L.); *G. bilineatus* is Regionally Extinct and *G. zonatus* is only known from Woolmer Forest, Hampshire within the UK (CR). Therefore, specimens have been given the status for *G. cinereus*.

[2] A*cilius* sp. larvae; larvae unidentifiable to species; listed as Local – the most abundant status of species in the genera.

[3] *Corixa affinis /Corixa dentipes* nymphs; unidentifiable to species; both species have Local status within the UK. *Corixa affinis* was recorded from P6-N and P6-S in the current survey.

Table 4 Species recorded in the 2015 & 2016 surveys listed on the Kent Rare and Scarce Species Inventory (Kent and Medway Biological Records Centre data) and the Essex Red Data List (Essex Field Club County Records data).

Taxon	**Common name**	**Status**	**Sites recorded (2015 & 2016 combined)**
Kent Rare and Scarce Species Inventory			
Hygrotus parallelogrammus	Diving Beetle	NS	NP
Rhantus frontalis	Diving Beetle	NS	SM5, BDM-W, BDM-N, P5
Enochrus halophilus	Water Beetle	NS	BM3, SM2, BDM-W, BDM-N
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N
Essex Red Data List			
Agabus conspersus	Diving Beetle	NS	BP
Hydroglyphus geminus	Diving Beetle	Local	NP
Hygrotus parallellogrammus	Diving Beetle	NS	NP
Cercyon sternalis	Water Beetle	Local	BM1, SM5, BDM-N, P6-N
Cercyon tristis	Water Beetle	Local	BM1, BDM-W, P6-S
Helochares lividus	Water Beetle	Local	NP, SM1, BDM-N, P5
Helophorus alternans	Water Beetle	NS	BM1, BM3, BM4, NP, SM2, P5, P6-S, ES3
Ochthebius marinus	Water Beetle	Local	BDM-W
Ochthebius viridus	Water Beetle	NS	BM2, BDM-W, BDM-N, P5
Oxycera rara	Four-barred Major - Soldierfly	Local	ES3
Stratiomys singularior	Flecked General - Soldierfly	NS	BDM-N
Demetrias imperialis [1]	Ground Beetle	NS	SM1, SM3, P6-N, P6-S

[1] This species though not aquatic was recorded in the listed samples.

Table 5 Number of species within targeted taxonomic groups.

	BDM-W	BDM-N	P5	P6-N	P6-S	All sites[1]
No. taxa	102	91	90	75	79	212
No. water beetle species	50	38	39	21	22	84
No. aquatic bug species	16	11	16	18	18	28
No. dragonfly species	4	3	5	7	5	11
No. caddisfly species	3	10	3	5	3	19

Note:

Data is from 2015 and 2016 surveys combined.

1 'All sites' indicates data from all surveyed sites in the 2015 and 2016 surveys combined (Swanscombe peninsula and Ebbsfleet corridor).

Table 6 Number of species of conservation interest recorded.

	BDM-W	BDM-N	P5	P6-N	P6-S	All sites[1]
No. Vulnerable taxa	1	1	0	0	0	1
No. Near Threatened taxa	1	1	1	0	0	3
No. Nationally Scarce taxa	10	7	7	2	1	14
No. Local taxa	20	20	18	17	17	56

Note:

Data is from 2015 and 2016 surveys combined.

[1] 'All sites' indicates data from all surveyed sites in the 2015 and 2016 surveys combined (Swanscombe peninsula and Ebbsfleet corridor).

5.1 Swanscombe Marsh

Black Duck Marsh (both west and north) contained a mosaic of reedbed and open water, bisected by a network of ditches, within the western section of the Swanscombe peninsula. The wetland habitats created in recent years by rising water levels flooding grazing fields were typically brackish, with variable water depths, in both the 2015 and 2016 surveys.

The sections of principally anoxic sediments associated with flooded grasses evident in 2015 were notably absent in the current survey. Observations by CBA staff indicated the western section of Black Duck Marsh had not been completely flooded over the preceding winter period, as compared to the previous year (no hydrological data for the area was available to the author at the time of writing).

The three ponds located in central section of the peninsula, created as mitigation for the impact of the construction of the Channel Tunnel Rail Link (CTRL), were included in the current survey as were the amongst the most species-rich of those surveyed in 2015.

The network of ditches in the central or eastern sections of the peninsula were not re-surveyed in 2016.

5.1.1 Swanscombe Marsh wetlands

5.1.1.1 Black Duck Marsh – west (BDM-W)

The network of *Phragmites*-lined ditches amongst flooded grassland and reedbeds within BDM-W exhibited variable conductivity levels though largely indicative of brackish conditions (between 1540 – 4300 µS cm^{-1}). Ditch D3 in the south-west of the area (BDM-W-5) was the only mesohabitat sampled not brackish during the current survey. The water was typically neutral or slightly alkaline (pH7.5 – 8.2).

Survey effort within the marsh was equally divided amongst the six mesohabitats surveyed during the 2015 summer survey (see sketch map, Appendix 2); these reflected the habitat variability within the marsh. Each mesohabitat was sweep netted or lightly kick sampled multiple times.

Black Duck Marsh – west - sub-sample 1 (BDM-W-1):

This sub-sample represented an area of flooded grassland in the western field among clumps of rush *Juncus* and *Salix* spp. scrub. Floating algae was evident throughout the shallower sections and amongst stems of emergent vegetation. The water was both neutral and brackish (2930 µS cm^{-1}).

Multiple sweep net hauls were field sorted, with specimens preserved in the field for laboratory identification. This allowed a far wider area to be sampled, due to the quantities of vegetative and algal material collected in each net haul.

This flooded grassland supported 11 species of water beetle; four species of conservation interest; three Nationally Scarce and one Local.

The Local *Hygrotus impressopunctatus* was previously recorded within Black Duck Marsh, though from a different mesohabitat. The Nationally Scarce *Ochthebius viridus* and *Enochrus halophilus* were previously recorded on the peninsula, though not from this marsh area (these two species are listed on the Essex Red Data List and the Kent Rare and Scarce Species Inventory, respectively). The Nationally Scarce *Enochrus bicolor* was not recorded from any surveyed habitat in the 2015

survey. This species is generally associated with coastal ponds and slow-flowing ditches; it has been previously recorded locally from Dartford Marshes (NBN Gateway[1] data).

These three Nationally Scarce water beetles typically favour coastal grazing marsh systems, though are associated with other wetland habitats.

The abundant and relatively species-rich aquatic bug fauna associated with this mesohabitat during the summer 2015 survey, was largely absent in the current survey.

Black Duck Marsh – west - sub-sample 2 (BDM-W-2):

BDM–W-2 represented an area of fringing reedbed along the eastern margin of the flooded eastern field. The water reasonably deep and brackish (3540 µS cm^{-1}). The sample from this mesohabitat was fixed in the field and laboratory sorted.

This marginal mesohabitat supported eight species of conservation interest in the current survey; seven of those from the targeted taxonomic groups and one other taxon.

A total of four Nationally Scarce water beetles was recorded; *Graptodytes bilineatus, Haliplus apicalis, Ochthebius viridus* and *Enochrus halophilus*. All of these species were recorded within the surveyed habitats in the 2015 survey, though none from this particular area of marsh. The latter two species are associated with, though not confined to, coastal grazing marsh habitats.

Though not amongst the targeted taxonomic groups of the current survey, a soldierfly with at least a Nationally Scarce distribution was found from this mesohabitat. The Flecked General *Stratiomys singularior*/Long-horned General *Stratiomys longicornis*, indistinguishable in immature larval specimens, is either Nationally Scarce or Vulnerable, respectively. *S. singularior* was recorded in Black Duck Marsh – north in the previous survey.

Species recorded with a Local distribution, were the water beetles *Cymbiodyta marginellus*, previously recorded from neighbouring ditch habitats, and *Ochthebius marinus*, not recorded in any of the 2015 surveyed habitats. This latter species has been locally recorded in Dartford Marshes (NBN Gateway data), and is cited in the Essex Red Data List. The Local aquatic bug *Microvelia reticulata* was recorded from this mesohabitat in both the 2015 and 2016 survey.

Relative to the 2015 summer survey, this mesohabitat supported a far more species-rich water beetle fauna; collectively 16 water beetle species have been recorded from this mesohabitat.

Black Duck Marsh – west - sub-sample 3 (BDM-W-3):

This sub-sample represented an area of open flooded grassland (the eastern field). The water levels were typically deeper here than in the neighbouring western field, and similarly brackish (3270 µS cm^{-1}). Floating algae was widely distributed amongst shallower sections of the field.

This area was sampled by multiple sweep net hauls sorted in the field.

This area of flooded grasses and rushes supported 13 water beetle species in the current survey; 17 species when combined with the summer 2015 survey findings. None of the water beetle species recorded were common to both surveys.

A total of five species of conservation interest were recorded in the current survey; the Local aquatic bug *Microvelia reticulata* and four water beetles, two Nationally Scarce (*Rhantus frontalis* and

[1] The National Biodiversity Network (NBN) is a collaborative partnership created to exchange biodiversity information; the NBN Gateway is an interactive online database of biological records.

Haliplus apicalis) and two Local (*Hygrotus impressopunctatus* and *Liopterus haemorrhoidalis*). *R. frontalis* is cited in the Kent Rare and Scarce Species Inventory.

Though none of these water beetle species were previously recorded from this mesohabitat, the former three species were recorded elsewhere on Black Duck Marsh in the 2015 survey. *L. haemorrhoidalis* (the Piles Beetle) was not, however, recorded in any of the surveyed habitats in the previous survey. This species is typically associated with richly vegetated lowland waterbodies; locally this species has been recorded from the Dartford Marshes (NBN Gateway data).

Black Duck Marsh – west - sub-sample 4 (BDM-W-4):

Sub-sample 4 represented an end-of-ditch area of shallow water amongst submerged algae, flooded grasses and marginal *Typha latifolia*; providing relatively complex vegetative habitat. The water here was notably brackish (4300 µS cm^{-1}).

This mesohabitat was sweep netted and the sample field sorted. Two bottle traps were set in and around this area in an attempt to capture mobile water beetle specimens; none were collected.

Whilst surveying for aquatic macroinvertebrates five smooth newts *Lissotriton vulgaris* were observed.

This mesohabitat supported a notably more species-rich water beetle fauna in the current survey than in 2015 (25 species as compared to eight).

In total, 13 species of conservation interest were recorded in this submerged vegetative habitat; 11 water beetle species, six of which are Nationally Scarce and five Local, one Local aquatic bug and the Nationally Scarce/Vulnerable soldierfly, the Flecked General *Stratiomys singularior*/Long-horned General *Stratiomys longicornis* (see note above re identification of immature larval specimens).

Only one of these seven water beetle species (the Nationally Scarce *Haliplus apicalis*) was recorded from this habitat in the previous survey. The Nationally Scarce *Graptodytes bilineatus* and *Ochthebius viridus*, the Local *Laccophilus hyalinus*, *Berosus signaticollis* and *Enochrus testaceus* were not previously recorded in any surveyed sites on Black Duck Marsh – west. The Nationally Scarce *Hydrovatus cuspidatus* and the Local *Liopterus haemorrhoidalis* were not recorded at any of the surveyed sites in 2015.

The former of these two previously unrecorded species, *Hydrovatus cuspidatus*, is associated with thinly vegetated marginal drainage ditch habitats; this species has been locally recorded from Romney Marsh (NBN Gateway data).

A further water beetle species previously unrecorded from surveyed sites on the peninsula, *Hydroporus nigrita*, was recorded from this mesohabitat. This species favours shallow waterbodies typically with mud and grasses; it is widespread in the UK, though less common in the south-east.

Black Duck Marsh – west - sub-sample 5 (BDM-W-5):

This sub-sample represented an area of floating and flooded grass with isolated sections of shallow surface water running alongside the southern-most ditch. The conductivity of the water here was notably less than elsewhere (1540 µS cm^{-1}).

This area was sampled by multiple sweep net hauls; these were bank sorted. Two bottle traps were set in and around this area. An adult diving beetle *Colymbetes fuscus* and larval *Dytiscus* sp. were captured in one trap set amongst the flooded grass. These taxa were also found whilst sweep netting the habitat.

Whilst surveying for aquatic macroinvertebrates a smooth newt *Lissotriton vulgaris* was observed.

This floating grass habitat supported eight species of conservation interest; six water beetle species, three Nationally Scarce and three with a Local distribution, one Local aquatic bug and the Nationally Scarce/Vulnerable soldierfly *Stratiomys* (see note above).

Of these eight species, seven were newly recorded from this mesohabitat and four were new records for Black Duck Marsh - west; all, however, were recorded elsewhere on the peninsula in the 2015 survey.

As found elsewhere in this area of marsh, the water beetle fauna was notably more species-rich in the current than the previous survey.

Black Duck Marsh – west - sub-sample 6 (BDM-W-6):

BDM-W-6 was taken from the main ditch running along the northern margin of the marsh. Marginal vegetation was dominated by *Phragmites* and their stems and debris provided the principal vegetative habitat for aquatic fauna, along with submerged algae. The water here was notably brackish (4200 μS cm^{-1}).

As found in the summer 2015 survey, dense zooplankton assemblages (principally Daphniidae) were observed in the water column at the time of sampling.

This habitat was sampled by sweep netting from the canoe; the sample was fixed in the field for laboratory sorting.

A single species of conservation interest was recorded within this section of ditch; the Local whirligig beetle *Gyrinus caspius*. This species was previously recorded on the peninsula, though not from this ditch habitat.

Black Duck Marsh – west – synopsis:

Black Duck Marsh – west supported a species-rich water beetle assemblage; 50 species when considering the 2015 and 2016 surveys combined (Table 5). This represented approximately one half of the total number of species recorded in this area.

A notably richer water beetle fauna was evident in the current survey, relative to the previous year (41 and 24 species for 2015 and 2016, respectively).

A total of 32 species of conservation interest were recorded in this area of marsh over the two surveys; 1 Vulnerable, 1 Near Threatened, 10 Nationally Scarce and 20 Local (Table 6). Water beetles represented 72 % of these species.

The two surveys yielded similar numbers of species of conservation interest to one another (19 and 20 species, for 2015 and 2016, respectively). The proportion of these species represented by water beetles was, however, higher in the current survey (85 % in 2016 as compared to 53 % in 2015).

5.1.1.2 Black Duck Marsh – north

BDM-N comprised a series of interconnected ditches and a small area of wetland separated by flooded *Phragmites* (see sketch map, Appendix 2). At the time of sampling the water was similarly brackish across the various waterbodies and notably more brackish than in the summer 2015 survey (4385 – 4490 μS cm^{-1}, as compared to 3360– 3315 μS cm^{-1}) and largely neutral.

Black Duck Marsh – north - sub-sample 1 (BDM-N-1):

BDM-N-1 was taken from an area of open water with emergent and marginal Sea Club-rush *Bolboschoenus maritimus* to the north of the northern peripheral ditch (ditch D4); separated from the ditch by an area of emergent *Phragmites*.

This area was sampled by multiple sweep net hauls; the material was bank sorted allowing a thorough survey of extensive quantities of vegetative material. A total of three bottle traps was set amongst the emergent vegetation in this area. No water beetles were captured in any of these traps.

Whilst surveying for aquatic macroinvertebrates a smooth newt *Lissotriton vulgaris* was observed.

In the current survey, a total of four species of water beetle with a Local distribution within the UK were recorded in this mesohabitat. Of these, three were recorded elsewhere on the peninsula in 2015, though not in this area of marsh.

The fourth species, the diving beetle *Dytiscus circumflexus*, The Wasp, was recorded amongst marginal emergent vegetation within this area of marsh (one female and one male specimen). This species is most typically, though not exclusively, associated with brackish coastal pools and ditches. *D. circumflexus* was not found in any of the surveyed habitats in 2015.

None of the water beetle species of conservation interest recorded in this mesohabitat were common to both surveys.

This patch of open marsh supported 24 species of water beetle when combining the findings from the two surveys.

Black Duck Marsh – north - sub-sample 2 (BDM-N-2):

Sub-sample BDM-N-2 was taken from various sections of marginal *Phragmites* habitat along the northern two-thirds of ditch D8 (until scrub encroachment prevented further southerly travel along the ditch by canoe, as in the summer 2015 survey). Floating green algae was evident amongst marginal stems.

This mesohabitat was sampled by multiple sweep net hauls from the canoe; the sample was fixed in the field for laboratory sorting.

This marginal ditch habitat supported nine species of conservation interest; the Near Threatened water beetle *Hydrochus ignicollis*, the Nationally Scarce crawling water beetle *Peltodytes caesus*, in addition to seven species with a Local distribution (four water beetles, two aquatic bugs and one aquatic snail).

The four Local water beetle species were new records for this area of marsh, however, all of these nine species of conservation interest were recorded elsewhere on the peninsula in the previous survey.

When considering findings from the two surveys combined, a total of 20 species of water beetle were recorded from this section of ditch.

Black Duck Marsh – north - sub-sample 3 (BDM-N-3):

This sub-sample was taken amongst the marginal and submerged vegetative habitats of the northerly section of ditch D9 (scrub encroachment prevented canoe travel along a large part of this ditch, as in the summer 2015 survey). Margins were dominated by overhanging brambles and branches from bankside scrub. In-channel vegetation was dominated by extensive submerged mats of filamentous algae.

This section of ditch was sampled by multiple sweep net hauls from the canoe; the sample was fixed in the field for laboratory sorting.

This section of ditch supported seven species of conservation interest; the Nationally Scarce crawling water beetle *Peltodytes caesus*, and six species of Local distribution (four water beetles, one aquatic bug and one phantom midge). Of these species, only the aquatic bug *Paracorixa concinna*,

was common to both surveys; all, however, were found elsewhere on the peninsula in the previous survey.

When considering findings from the two surveys combined, a total of 17 species of water beetle were recorded from this section of ditch.

Black Duck Marsh – north – synopsis:

When considering findings from the two surveys combined, this section of marsh supported 38 species of water beetle; this represented in excess of 60 % of the total number of species recorded here (Table 5). The water beetle assemblage was more species-rich in the current than in the previous survey.

BDM-N supported 28 species of conservation interest (2015 and 2016 surveys combined); 1 Vulnerable, 1 Near Threatened, 6 Nationally Scarce and 20 Local (Table 6). Water beetles represented 64 % of these species. A number of these are listed in the Kent Rare and Scarce Species Inventory.

As found in BDM-W, the aquatic bug assemblage was less species-rich in the current than the previous survey; nevertheless, supported a number of species of conservation interest.

5.1.2 Swanscombe Marsh ponds

5.1.2.1 Pond P5

Pond P5 is located within the central peninsula; this pond, along with P6-N and P6-S, were created as mitigation for the impact of the construction of the Channel Tunnel Rail Link.

This pond is relatively small (approximately 900 m^2) and shallow with densely vegetated margins (see sketch map, Appendix 2).

At the time of sampling the water in this pond was neutral and notably fresh (conductivity 1266 $\mu S\ cm^{-1}$).

Pond P5 - sub-sample 1 (P5-1):

P5 supported submerged patches of Common Stonewort *Chara vulgaris* and widespread submerged algae within the central section of open water. Sub-sample P5-1 was taken amongst these open water habitats.

This mesohabitat was sampled by sweep netting submerged vegetation and the substratum surface multiple times; netted material was fixed in the field for laboratory sorting.

In the current survey, this submerged vegetative habitat supported 19 species of water beetle and 10 species of aquatic bug.

A total of 14 species of conservation interest were recorded in the current survey; the Nationally Scarce water beetles *Graptodytes bilineatus*, *Rhantus frontalis* and *Haliplus apicalis*, and 11 species with a Local distribution, nine water beetles and two aquatic bugs. Of these, two were previously recorded in this pond; eight were previously recorded elsewhere on the peninsula; and one species *Liopterus haemorrhoidalis*, The Piles Beetle, was not found in any of the surveyed sites in the 2015 survey.

Pond P5 - sub-sample 2 (P5-2):

Marginal vegetative habitats were dominated by emergent *Typha latifolia*, *Phragmites australis* and rush *Juncus* sp. Patches of submerged *Chara vulgaris* and submerged algae were evident amongst the marginal flooded reedbeds. More open sections of the pond margin supported shallow

flooded grasses and *Chara vulgaris*. Sub-sample P5-2 was taken amongst the relatively complex vegetative structure of the pond margins.

Multiple sweep net hauls from these marginal areas were bank sorted with sorted specimens fixed for laboratory identification.

At the time of sampling surface water, of reasonable depth, was evident amongst the marginal reedbed and *Juncus* some distance from, and contiguous with, the pond itself.

In the current survey, this marginal habitat supported 26 species of water beetle and eight species of aquatic bug.

A total of 12 species of conservation interest were recorded; the Nationally Scarce water beetle *Graptodytes bilineatus*, the whirligig beetle *Gyrinus paykulli*, the crawling water beetles *Haliplus apicalis* and *Peltodytes caesus*, and the scavenger water beetle *Helophorus alternans*, and 7 species with a Local distribution (five water beetles and two aquatic bugs). All of these species were previously recorded on the peninsula, only three, however, were previously recorded from this pond.

P5 – synopsis:

Pond P5 supported a notably species-rich water beetle assemblage; 39 species (when combining 2015 and 2016 survey data). This represented 17 species of water beetle in the 2015 survey and 34 species in 2016.

The pond supported a total of 16 species of aquatic bug (combined survey data); the relative diversity of the aquatic bug fauna was similar amongst the two surveys.

A total of 26 species of conservation interest were recorded from this pond over the two surveys; 1 Near Threatened, 7 Nationally Scarce and 18 with a Local distribution. The number of species of conservation interest almost doubled between the 2015 and 2016 surveys.

Water beetles represented approximately 45 % of the aquatic macroinvertebrate assemblage recorded in this pond within the two surveys. When considering species of conservation interest, however, they represented approximately 77 % of this total.

A number of these water beetle species are typically confined to or favour grazing marsh habitats.

When comparing the targeted taxonomic groups within the two surveyed mesohabitats in the pond, the submerged vegetation supported more species of conservation interest, the marginal vegetation, however, supported a more species-rich assemblage.

5.1.2.2 Pond P6 – north

P6 was located within an extensive area of reedbed. The pond supported dense marginal vegetation, principally *Phragmites* with *Bolboschoenus maritimus, Typha latifolia* and Common Spike-rush *Eleocharis palustris*.

During the summer 2015 survey the open water habitat comprised approximately 50 % cover submerged and floating *Potamogeton pusillus* with occasional *Chara vulgaris* and filamentous green algae. During the current survey, however, this pond supported no observable submerged macrophytic vegetation; green algae was widespread however within the water column and marginal stems.

The biomass of the submerged vascular plant assemblage is likely to have been limited given the timing of the current survey, relative to the 2015 survey. Warm conditions during the intervening months, since the summer 2015 survey, may have permitted largely unchecked algal growth, effectively smothering submerged macrophytic vegetative habitats. This is, however, conjecture.

At the time of sampling the water was turbid, alkaline and brackish (pH 8.14 and conductivity 2077 µS cm^{-1}).

Within each of the mesohabitats of this pond, multiple sweep net hauls were taken both from the canoe and by wading shallower sections; netted material was fixed in the field for laboratory sorting.

Pond P6-N - sub-sample 1 (P6-N-1):

Sub-sample P6-N-1 was taken amongst the submerged algae within the open water and the sediment surface.

Dense populations of zooplankton (principally Daphniidae) were evident in the water column.

During the current survey this habitat supported two species with a Local distribution within the UK; the aquatic bugs *Corixa affinis* and *Paracorixa concinna*; both species are typically associated with brackish or high conductivity waterbodies. The latter of these species was recorded in the 2015 summer survey.

The two water beetle species recorded from this mesohabitat, in the previous survey, with a Local distribution, were not recorded in the current survey.

Pond P6-N - sub-sample 2 (P6-N-2):

Sub-sample P6-N-2 was taken amongst the marginal and emergent *Bolboschoenus maritimus*. Floating and submerged algae was evident both amongst and on submerged stems.

A total of four water beetle species of conservation interest were recorded amongst this marginal mesohabitat; the Nationally Scarce *Helophorus nanus*, and three with a Local distribution in the UK. Only one of these species was recorded from this mesohabitat in the previous survey (*Berosus affinis*). Neither *Helophorus nanus* nor the Local *Hydraena testacea* were recorded in any of the waterbodies surveyed in the 2015 survey.

H. nanus is generally associated with fen conditions, amongst grasses; locally this species has been recorded in the Dartford Marshes (NBN Gateway data).

None of the seven species of aquatic bug of conservation interest, previously recorded from this mesohabitat, were recorded in the current survey.

Pond P6-N - sub-sample 3 (P6-N-3):

This sub-sample was taken amongst the marginal and emergent *Phragmites australis*. Floating and submerged algae was again evident both amongst and on submerged stems.

A single species of conservation interest was recorded in this mesohabitat; the Local water beetle *Cercyon sternalis*; this species is on the Essex Red Data List. This species was previously unrecorded in this pond, was however found amongst ditch habitats on the peninsula in 2015; this species is known to tolerate brackish conditions.

None of the species of conservation interest previously recorded from this mesohabitat were found in the current survey.

P6 – N – synopsis:

Findings from the 2015 survey categorised this pond as Very High conservation value and it met criteria necessary for Priority Pond status, on the basis of the richness of its faunal assemblage. The targeted nature of this survey did not intend to reiterate these analyses.

A total of 11 taxa not previously recorded from this pond were recorded in the current survey; including two cased caddisflies, two water beetles and one aquatic bug. The caddisfly species *Limnephilus vittatus* was not recorded from any of the surveyed waterbodies in the previous survey. This species is widespread within the UK.

Pond P6-N supported far fewer species, from the targeted taxonomic groups, during the current survey than found in the summer 2015 survey. Nevertheless, it did support a number of species of conservation interest, not recorded from this pond in the previous survey, including two water beetle species not recorded in any of the surveyed sites in the summer 2015 survey (the Nationally Scarce *Helophorus nanus* and the Local *Hydraena testacea*).

Combining findings from the two surveys, pond P6-N supported 19 species of conservation interest; two Nationally Scarce water beetles, *Peltodytes caesus* and *Helophorus nanus*, and 17 Local species (one mayfly, one dragonfly, six water beetles, eight aquatic bugs and one aquatic snail).

A total of 21 species of water beetle and 18 species of aquatic bug were recorded from this pond (using findings from the two surveys combined). These represented approximately 30 % and 25 % of the total number of species recorded, for the two groups, respectively. When considering the species of conservation interest, however, water beetles and aquatic bugs each accounted for 42 % of the total number of species.

Of the three mesohabitats surveyed P6-N-2, marginal and emergent *Bolboschoenus maritimus,* supported the most speciose faunal assemblage and the highest number of species of conservation interest.

5.1.2.3 Pond P6 – south

Pond P6-S was a large elliptical pond adjacent to the Channel Tunnel Rail Link compound, separated from P6-N principally by *Phragmites* and *Salix*.

During the summer 2015 survey the water in P6-S was notably fresh (1042 µS cm^{-1}); in the current survey however, the water was brackish (2076 µS cm^{-1}).

The south-western margin of the pond was dominated by *Phragmites* with occasional *Typha latifolia*. The north-eastern margin was typically more diverse with patches of both *T. latifolia* and Lesser Reedmace *Typha angustifolia*, *Eleocharis palustris*, Water-plantain *Alisma plantago-aquatica* and Grey Club-rush *Schoenoplectus tabermaemontani*.

During the summer 2015 survey the central section of open water and south-eastern section of the pond supported dense growths of submerged macrophytic vegetation, such as Small Pondweed *Potamogeton berchtoldii*, Water Starwort *Callitriche* sp. and *Ranunculus baudotii*. During the current survey these dense growths were largely absent.

Where patches of submerged *Potamogeton berchtoldii* persisted, these largely supported a covering of submerged algae. Submerged algae were widespread in the pond, within the open water, amongst submerged macrophytes and marginal stems.

Phytoplankton was notably evident within the water column relative to that observed in the previous survey.

During the 2015 survey, sub-sample P6-S-3 was taken amongst the patches of mixed-species submerged vegetative habitat. This habitat was absent from the pond in the current survey, and therefore no sample was taken. The numbering of the remaining sub-samples was retained from the previous survey for comparison purposes.

Within the three remaining mesohabitats of pond P6-S, multiple sweep net hauls were taken both from the canoe and by wading shallower sections; netted material was fixed in the field for laboratory sorting.

Pond P6-S - sub-sample 1 (P6-S-1):

Sub-sample P6-S-1 was taken amongst the dense stands of *T. latifolia* and *T. angustifolia*.

These *Typha* stands did not support any species of conservation interest. All species recorded in the current survey were previously recorded on the peninsula; two water beetle species (*Ochthebius minumus* and *Noterus clavicornis*), however, were not previously recorded from this pond.

The four species of aquatic bug with a Local distribution recorded in 2015 were absent from this mesohabitat in the current survey.

Pond P6-S - sub-sample 2 (P6-S-2):

This sub-sample was taken amongst the submerged *Potamogeton berchtoldii* and submerged algae at various locations within the open water.

A total of three species with a Local distribution were recorded amongst this submerged vegetation; the water beetles *Berosus affinis* and *Berosus signaticollis* and the aquatic bug *Corixa affinis*.

The latter two of these are known to tolerate and or favour brackish conditions; neither were recorded from this pond in the previous survey. Their presence is likely to reflect the increasing salinity of this waterbody. The diving beetle *Ilybius fuliginosus*, recorded in this pond in the current survey though not in 2015, is known to tolerate brackish conditions; this species is widespread within the UK.

Pond P6-S - sub-sample 4 (P6-S-4):

P6-S-4 was taken amongst various sections of the marginal and emergent stands of *Phragmites australis*.

This marginal habitat supported four species with a Local distribution; two water beetles, one aquatic bug and one aquatic snail. All these species were recorded on the peninsula in the 2015 survey, however three were not previously recorded from this waterbody.

Of the species recorded here, the Local water boatman *Paracorixa concinna*, is known to breed in saline water; the Local diving beetle *Rhantus suturalis*, favours, though is not confined to, grazing marsh habitats.

P6 – S – synopsis:

When considering the findings from the two surveys, this pond supported a total of 22 water beetle species and 18 aquatic bugs.

The species-richness of the water beetle fauna varied little amongst the two years. The species composition, however, varied amongst these surveys; approximately 60 % of the beetle species found in the current survey were absent in the previous survey (though found elsewhere within surveyed sites on the peninsula).

The aquatic bug assemblage was notably less species-rich in the current than the previous survey.

A total of 18 species of conservation interest were recorded in this pond (data from the two surveys combined); the Nationally Scarce water beetle *Helophorus alternans* and 17 Local species, one mayfly, one dragonfly, five water beetles, eight aquatic bugs and two aquatic snails.

The variation in the composition of the faunal assemblage amongst the two surveys, is likely to reflect, at least in part, the increase in salinity recorded in the current survey with respect to that in the 2015 summer survey.

The relative variety of vegetative habitat structure, provided by the diversity of submerged vascular plants, in the previous survey, as compared to that provided by the plant assemblage observed in the current survey, is likely to have, at least in part, been reflected in the faunal assemblage.

5.1.3 Swanscombe Marsh – synopsis

Values provided in the discussion below, unless otherwise stated, are using data from the two surveys combined (see Table 5 and Table 6).

A total of 133 species were recorded from the various ditch and wetland habitats within Black Duck Marsh – west and north; 132 species were recorded from the three ponds created as mitigation for the Channel Tunnel Rail Link.

Water beetles were the most species-rich taxonomic order with a total of 84 species recorded from all surveyed sites (61 from Black Duck Marsh habitats and 47 from the CTRL ponds). The water beetle assemblages from the various waterbodies typically contained more species of conservation interest than any other taxonomic group.

The Species Quality Index (representing the average Species Quality Score assigned to water-beetle species) for Swanscombe Marsh was 2.85 (greater than 2.0 indicates a *good* wetland site); when combined with Botany Marsh to provide a value for the peninsula as a whole this value was 2.84. These values equate to 'wet scores' of 191 and 199, respectively (the SQS score multiplied by the number of species); a value in excess of 100 indicates a '*top site*' for water beetles (Foster and Eyre, 1992).

Aquatic bugs were the second most speciose order with 17 and 25 species from Black Duck Marsh habitats and the CTRL ponds, respectively (28 species for all surveyed sites combined). Of the remaining targeted taxonomic groups; a total of 11 species of damselfly and dragonfly, and 19 species of caddisfly, were recorded from all surveyed sites combined.

The wetland and aquatic habitats of Black Duck Marsh supported 47 species of conservation interest; one Vulnerable, two Near Threatened, 10 Nationally Scarce and 34 Local.

The three CTRL ponds supported one Near Threatened species, eight Nationally Scarce and 32 Local species.

When considering all sites surveyed, a total of one Vulnerable, three Near Threatened, 14 Nationally Scarce and 56 Local species were recorded amongst a total of 212 species.

5.2 Relative conservation importance of study area

There are no published criteria upon which to base an evaluation of the conservation importance of the faunal assemblages of the aquatic and wetland habitats on the Swanscombe peninsula.

Findings from the 2015 survey tentatively categorised these habitats of the peninsula as being of County or Regional importance. This status reflected findings from the survey in comparison to published material for grazing marshes within the UK. Within the local area, wetlands of both Regional (e.g., Wennington and Aveley Marshes, in Essex) and County or Local value (e.g., Dartford and Crayford Marshes, in Kent) were identified in Drake, 2004. This second survey further supported this earlier evaluation.

6 Conclusions and recommendations

6.1 The Swanscombe peninsula aquatic and wetland habitats

The Swanscombe peninsula consists of the eastern Botany Marsh and the western Swanscombe Marsh; the current survey focused on selected wetlands and waterbodies within Swanscombe Marsh. The two areas of wetland amongst a network of interconnected ditches in the west of the marsh (Black Duck Marsh – west and north) and a series of three ponds to the east, created as mitigation for the Channel Tunnel Rail Link, were investigated in the current survey.

The current survey, undertaken earlier in the spring relative to the previous survey, targeted taxonomic groups under-represented in the previous survey, largely a result of survey timing relative to the life cycle of the taxa.

In the previous survey, the two wetland areas supported notably rich faunal assemblages with numerous species of conservation interest; both were categorised as Very High conservation value. The three ponds were of the quality necessary for UK BAP Priority Pond status. Repetition of these analyses was neither appropriate (given the targeted nature of the current survey) nor necessary.

Notable between-year variation in the abiotic and biotic habitats in both the wetlands and ponds were observed.

Within the flooded fields of Black Duck Marsh notably less anoxic sediment was evident in the current than the previous survey. This may or may not reflect the relative water depth and the length of time the fields had been inundated over the months preceding the two surveys. These flooded fields supported a markedly richer water beetle fauna in the current than the previous survey; this may at least partly reflect the observed habitat changes. Decaying vegetation, a result of flooding particularly in summer, could have led to deoxygenation in parts of Black Duck Marsh in 2015, thereby limiting species richness.

Likewise, variation in the biotic habitats within the two P6 ponds was evident between the two surveys. The abundance of algal species, floating and submerged filamentous species and phytoplankton, was notably higher in the current than the previous survey. This may reflect temporal variability in abiotic parameters, such as water temperature or salinity, over the preceding months relative to the previous year (though no data was available to the author at the time of writing). The between-year variation in composition of the aquatic faunal assemblages of these two ponds may, at least in part, be a response to these habitat changes.

Findings from the current survey added to the previous list of species recorded both for the marsh as a whole and for the individual waterbodies. Of the species found in the current survey, previously unrecorded in any of the surveyed sites, several are of conservation interest; one is listed in the Essex Red Data List.

A total of 74 species of conservation interest were recorded amongst the surveyed sites within the two surveys.

As described earlier, the marsh supported a notably species-rich water beetle assemblage with a high proportion of less common species. A total of eight species of water beetle previously unrecorded in any of the surveyed sites, either on the peninsula or Ebbsfleet corridor, were found in the current survey; of these, seven were of conservation interest.

Many species, notably though not exclusively water beetles, were recorded from mesohabitats and or waterbodies in which they were previously unrecorded.

The presence of a species in a habitat in which it was previously not found may simply reflect that a given sample is likely to yield only a portion of the total assemblage associated with that habitat at any given time. Further sampling effort can be expected to increase the proportion recorded.

Nevertheless, it is likely that mobile species travel amongst suitable habitats and waterbodies within the peninsula. Aquatic and wetland invertebrates, amphibians and mammals are known to utilise networks of habitats. The interconnectedness of the various wetlands, ditches and ponds, physically and or hydrologically, provides the opportunity for these movements, and is thus particularly important for biodiversity. Individual waterbodies therefore enhance the regional diversity in addition to providing their own value.

Spatial and temporal variability in physical and hydrological parameters associated with a waterbody will influence its suitability for a given species and hence the propensity of that species to migrate.

Spatially salinity gradients were observed across the various waterbodies on the peninsula; salinity levels were observed to fluctuate temporally both diurnally and over a longer time scale. The suitability of a given waterbody in terms of this one environmental parameter, for a particular species will therefore vary, potentially beyond tolerance levels, thus forcing migration to a more suitable habitat (and vice-versa for a species favouring different salinity levels). Similar variability in water depths were observed amongst ditch habitats in the previous survey; water levels were observed to vary between the two surveys across Black Duck Marsh.

Abiotic and biotic habitat variability within this network of wetland and aquatic habitats across the peninsula therefore provides an environment able to support a particularly species-rich macroinvertebrate assemblage.

6.2 Value of the sites

A total of 212 species of aquatic macroinvertebrate were recorded in the two surveys combined. Amongst these, several species of conservation concern were recorded; one Vulnerable, three Near Threatened, 14 Nationally Scarce and 56 with a Local distribution within the UK.

The previous survey indicated the aquatic and wetland habitats on the peninsula to be of high conservation value. The current survey typically added both to the species-richness and list of species of conservation interest recorded from each of these habitats. Several species recorded in both studies were listed in the Kent Rare and Scarce Species Inventory and or the Essex Red Data List.

A comparison of findings from the previous survey with those published for similar habitats within the UK indicated wetland and aquatic habitats on the Swanscombe peninsula could tentatively be categorised as being of County value, if not Regional. Findings from this second survey supported this classification. Locally, north Kent supports grazing marshes defined as both Regional and County value.

The faunal assemblages of the Swanscombe peninsula are isolated from these neighbouring wetland habitats. Nevertheless, proximity among species-rich habitats, even fragmented ones, can potentially influence the diversity of these habitats.

Coastal and floodplain grazing marsh has been identified as being a UK BAP Priority Habitat; the Kent coastal and floodplain grazing marsh Habitat Action Plan identifies the loss of grazing marsh habitat through industrialisation and development as a key threat, particularly in the Greater Thames Estuary. Grazing marshes when found in coastal areas, such as this, provide the

brackish conditions favoured by species which are often scarce due to the limited availability of brackish habitats nationally. Several uncommon species recorded in the current study are tolerant of or confined to brackish habitats and or show a high fidelity to coastal grazing marsh habitats (despite a current lack of grazing management within the surveyed sections of the peninsula).

6.3 Impacts and recommendations

Findings from the current survey added to the value of the individual surveyed waterbodies and the marsh as a whole. The impacts and recommendations regarding the proposed development on the peninsula discussed in the previous report remain unchanged; it is therefore unnecessary to repeat these at length in this addendum report (though a summary is provided below).

It is likely that substantial areas of aquatic and wetland habitat and associated biodiversity, on the Swanscombe peninsula and along the Ebbsfleet corridor, will lie within the development footprint. A number of these potentially impacted waterbodies currently represent compensation for previous habitat losses and fragmentation in the locality.

The current survey further highlighted the importance of the interconnectedness of the waterbodies on the peninsula. Any reduction in this interconnectedness will reduce biodiversity on a landscape scale potentially leading to isolated populations and pockets of habitat, further stressing an already fragmented population. Loss of individual waterbodies will mean the loss of diversity hotspots within this landscape. The hydrological connectivity amongst waterbodies ensures potential detrimental impacts could have a knock-on effect elsewhere within the drainage system.

If the loss of ponds of UK BAP Priority Pond status is unavoidable then a suitable level of compensation is appropriate. Pond HAP target 4 requires 'enhancement' to be demonstrated beyond the compensation appropriate for the loss of a BAP priority habitat. If replacement waterbodies in otherwise unaffected neighbouring areas are to be constructed to mitigate loss of habitat, these should be undertaken prior to the loss of any existing waterbodies. Where waterbodies are to remain, wherever possible, measures could be taken to enhance their biodiversity.

Building on a wetland will impact on its hydrology. Mitigation measures would need to be put in place if the water quality and quantity of the remaining aquatic habitats is not to deteriorate.

Whatever mitigation measures are planned a monitoring programme evaluating the rate and success of establishment of any new pond, ditch or wetland, or potential detrimental impacts on pre-existing waterbodies, with reference to baseline data, should be undertaken, along with contingency plans.

7 Glossary of abbreviations and terms used in text

ASPT	Average Score Per Taxon
BAP	Biodiversity Action Plan
BMWP	Biological Monitoring Working Party
CBA	Chris Blandford Associates
CCI	Community Conservation Index
CoS	Community Score
CS	Conservation Score
CTRL	Channel Tunnel Rail Link
EQI	Ecological Quality Index
FBA	Freshwater Biological Association
GQA	General Quality Assessment
HAP	Habitat Action Plan
IBI	Index of Biological Integrity
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
NBN	National Biodiversity Network
NPS	National Pond Survey
PSYM	Predictive SYstem for Multimetrics
RDB	Red Data Book
RIVPACS	River InVertebrate Prediction and Classification System
SRI	Species Rarity Index
SQI	Species Quality Index
TRS	Trophic Ranking Score
WHPT	Whalley Hawkes Paisley Trigg

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9 Appendices

Appendix 1: Photographs

Waterbodies & wetlands on the Swanscombe peninsula; Black Duck Marsh west:

Photograph 1 Black Duck Marsh – west. The western field showing shallow surface water amongst grass and rush (mesohabitat BDM-W-1).

Photograph 2 Black Duck Marsh – west. Floating algae in sections of deeper water (mesohabitat BDM-W-1).

Photograph 3 Black Duck Marsh – west showing fringing *Phragmites* in flooded eastern field (mesohabitat BDM-W-2).

Waterbodies & wetlands on the Swanscombe peninsula; Black Duck Marsh west:

Photograph 4 Black Duck Marsh – west; flooded eastern field showing floating algae in shallow sections amongst flooded grass (mesohabitat BDM-W-3). Deeper water towards fringing *Phragmites*.

Photograph 5 End of ditch D4 in western section of Black Duck Marsh – west (mesohabitat BDM-W-4). Several smooth newts were observed within this area.

Photograph 6 Area of flooded and floating grass in the south-west of Black Duck Marsh – west (mesohabitat BDM-W-5). The diving beetle *Colymbetes fuscus* and several *Dytiscus* diving beetle larvae were collected in bottle traps in this section of the marsh.

Waterbodies & wetlands on the Swanscombe peninsula; Black Duck Marsh west & north:

Photograph 7 *Phragmites* fringed open water habitat of Ditch D4 in Black Duck Marsh – west (mesohabitat BDM-W-6).

Photograph 8 Black Duck Marsh – north; mesohabitat BDM-N-1. Bottle traps were set amongst emergent *Bolboschoenus maritimus* in the centre of the photograph; none were successful in capturing adult water beetles.

Photograph 9 Ditch D8 in Black Duck Marsh – north; showing deep open water habitat.

Waterbodies & wetlands on the Swanscombe peninsula; Ponds in Swanscombe Marsh:

Photograph 10 Pond P5 showing extensive marginal vegetation habitats. Floating algae was evident amongst marginal vegetation and submerged *Chara* in open water. Surface water extended amongst the marginal *Phragmites* for some distance from the pond.

Photograph 11 Sweep net sampling the shallower open water habitats in pond P6-N.

Photograph 12 Pond P6-S showing submerged algae amongst submerged macrophytes in open water, in foreground of photograph. Submerged macrophytic mesohabitats were less extensive and diverse in the current survey relative to summer 2015.

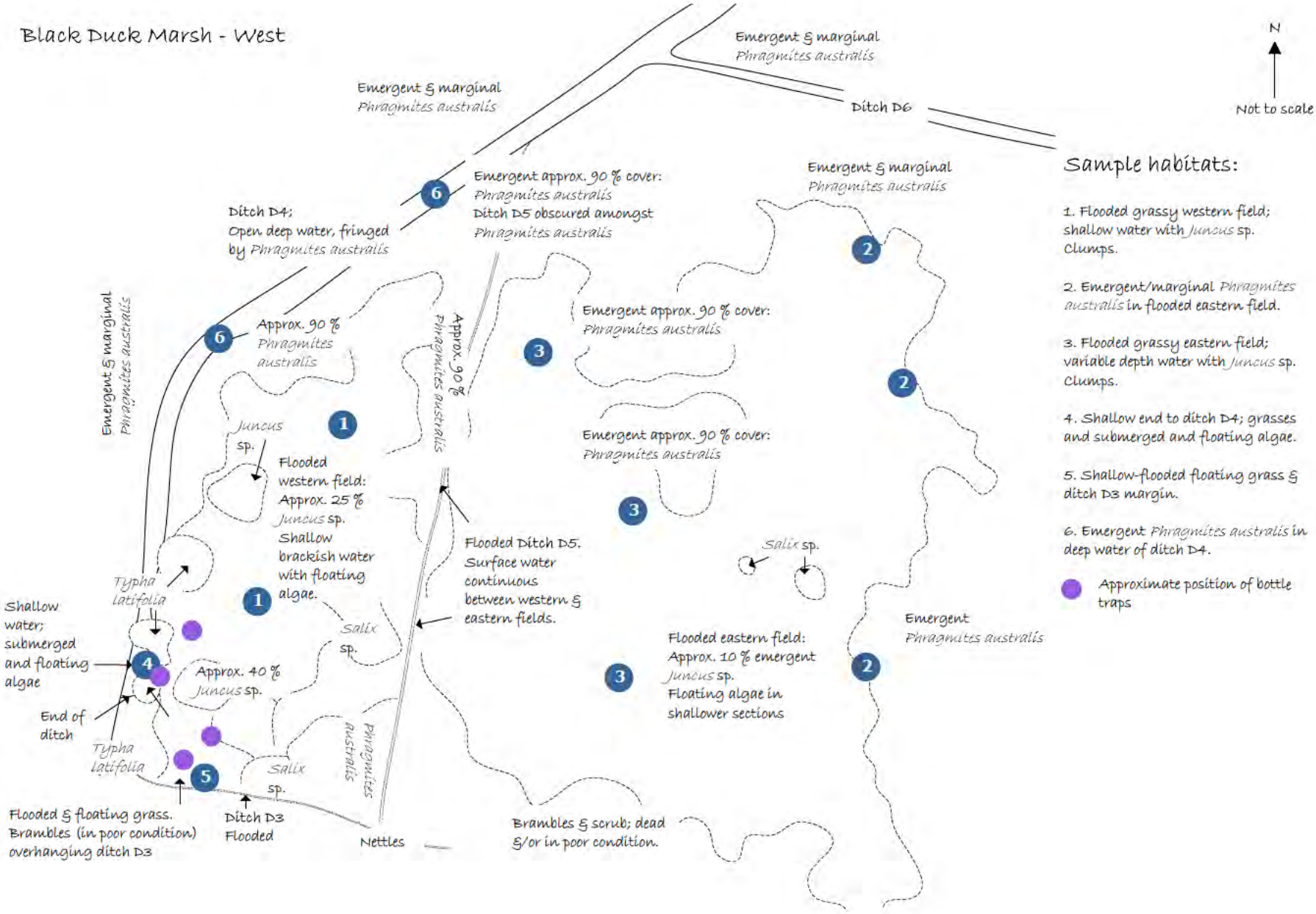
Appendix 2: Sketch maps of wetlands and ponds

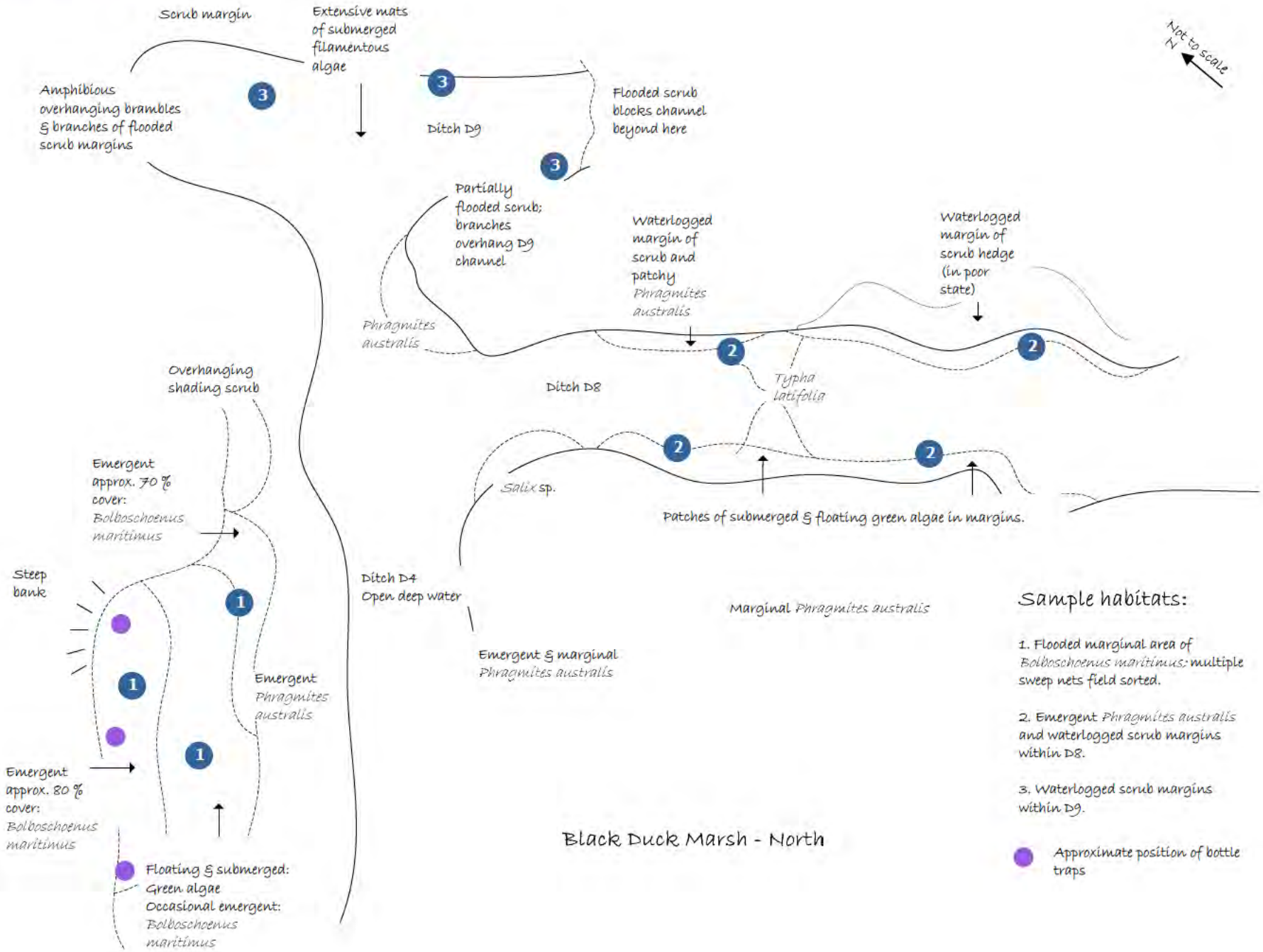
The following maps illustrate the approximate extent and distribution of vegetative habitats within the various wetlands and ponds surveyed in 2016.

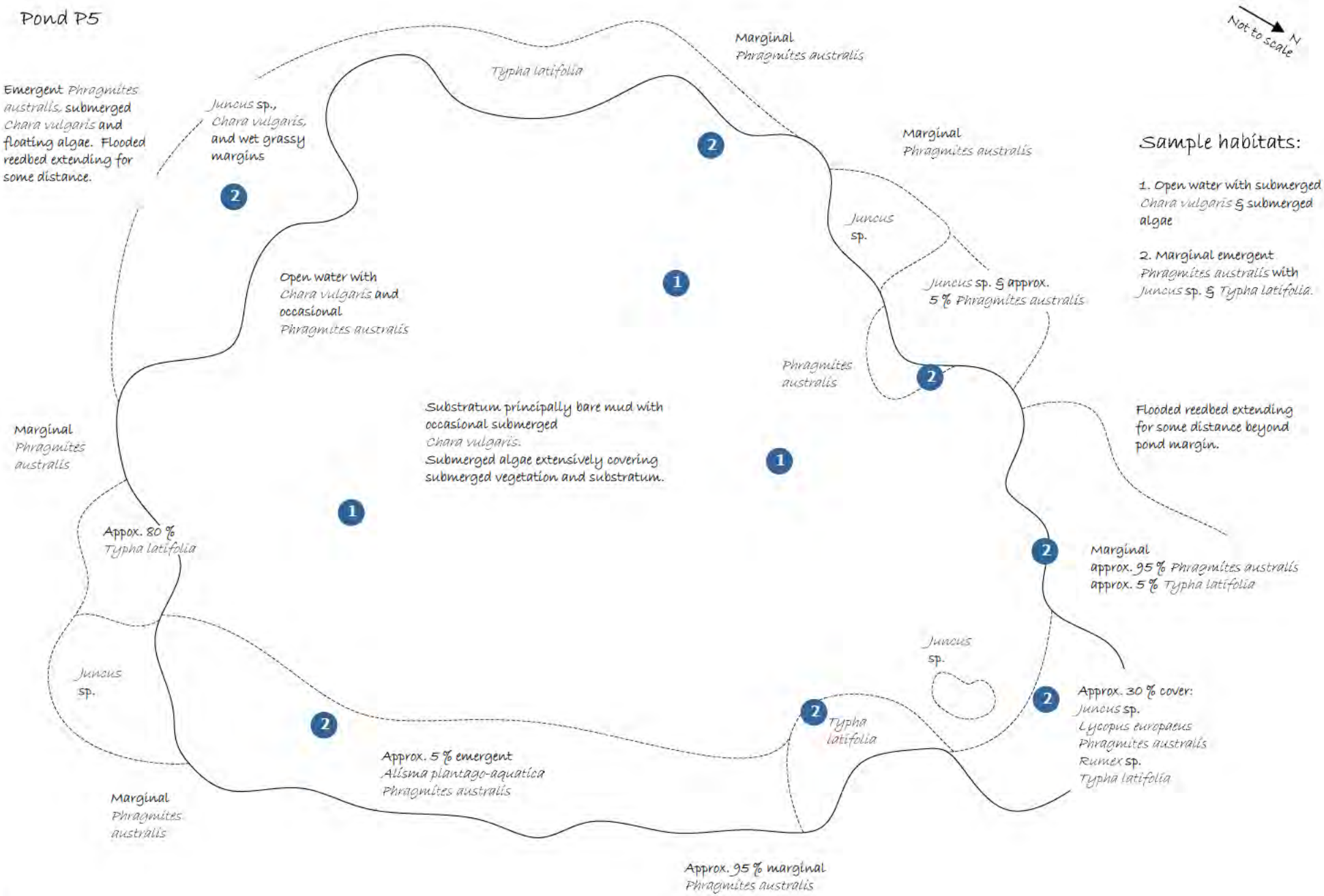
Maps are not to scale.

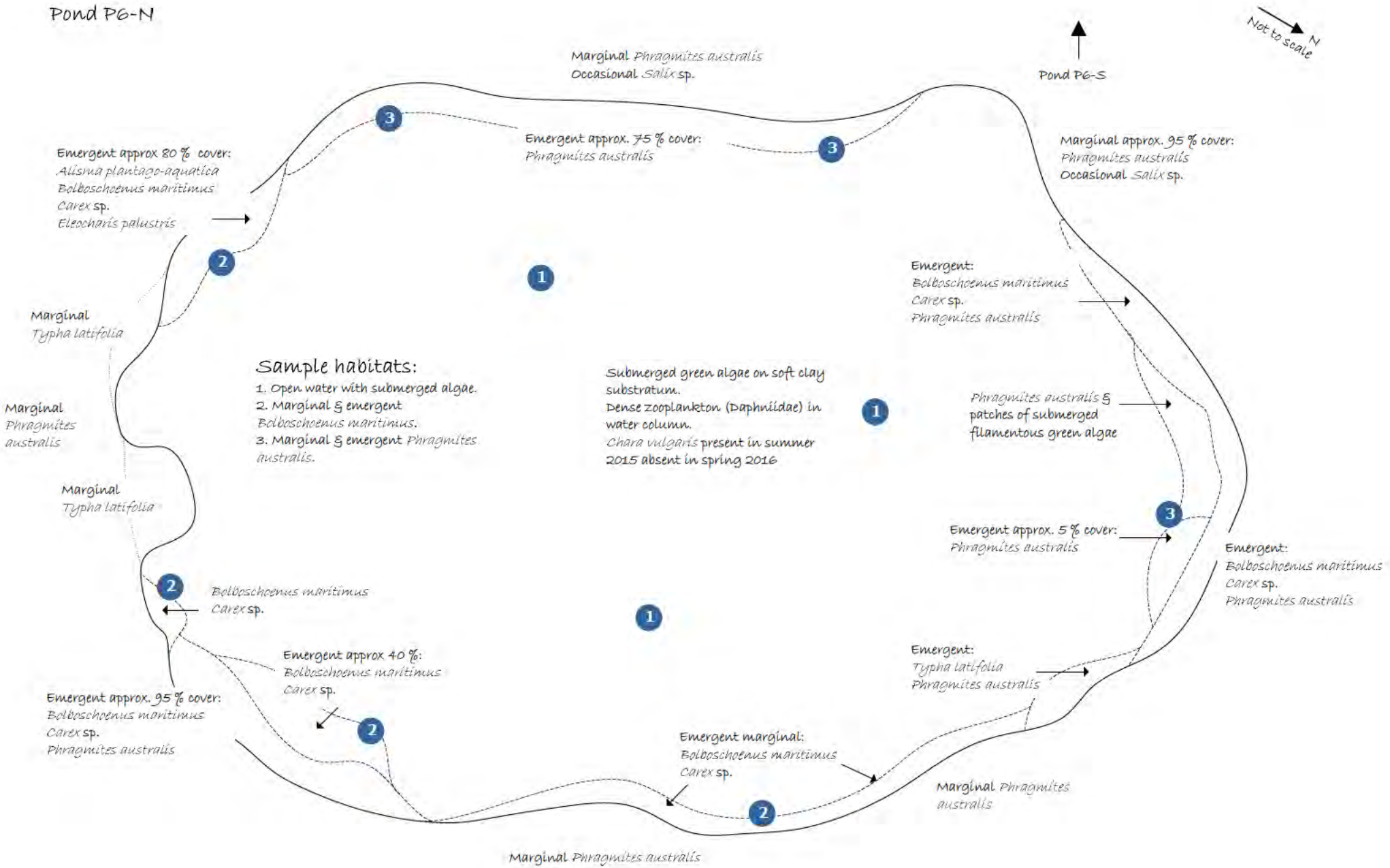
Filled blue circles indicate approximate location of sample stations.

Filled purple circles indicate approximate location of bottle traps.

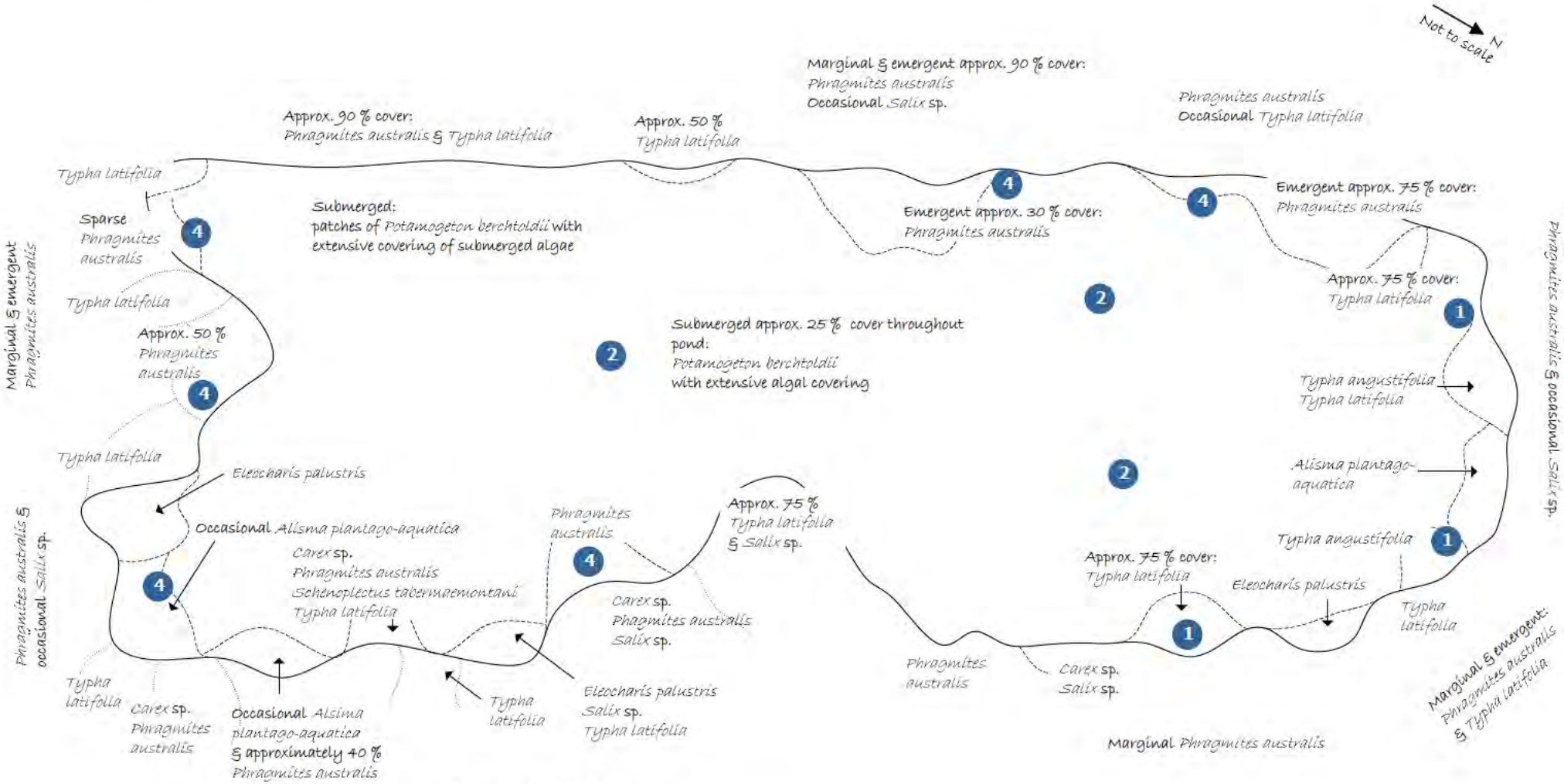

Black Duck Marsh - West
Emergent & marginal
Phragmites australis
Ditch D6
N
Not to scale
Emergent & marginal
Phragmites australis
Emergent approx. 90 % cover:
Phragmites australis
Ditch D5 obscured amongst
Phragmites australis
Ditch D4;
Open deep water, fringed
by Phragmites australis
Emergent & marginal
Phragmites australis
Approx. 90 %
Phragmites australis
Approx. 90 %
Phragmites australis
Emergent approx. 90 % cover:
Phragmites australis
Emergent approx. 90 % cover:
Phragmites australis
Juncus
sp.
Flooded
western field:
Approx. 25 %
Juncus sp.
Shallow
brackish water
with floating
algae.
Flooded Ditch D5.
Surface water
continuous
between western &
eastern fields.
Salix sp.
Typha
latifolia
Shallow
water;
submerged
and floating
algae
Salix
sp.
Approx. 40 %
Juncus sp.
End of
ditch
Typha
latifolia
Salix
sp.
Phragmites
australis
Flooded & floating grass.
Brambles (in poor condition)
overhanging ditch D3
Ditch D3
Flooded
Nettles
Brambles & scrub; dead
&/or in poor condition.
Flooded eastern field:
Approx. 10 % emergent
Juncus sp.
Floating algae in
shallower sections
Emergent
Phragmites australis
Sample habitats:
1. Flooded grassy western field; shallow water with Juncus sp. Clumps.
2. Emergent/marginal Phragmites australis in flooded eastern field.
3. Flooded grassy eastern field; variable depth water with Juncus sp. Clumps.
4. Shallow end to ditch D4; grasses and submerged and floating algae.
5. Shallow-flooded floating grass & ditch D3 margin.
6. Emergent Phragmites australis in deep water of ditch D4.
Approximate position of bottle traps


Scrub margin
Extensive mats of submerged filamentous algae
Amphibious overhanging brambles & branches of flooded scrub margins
3
3
3
Ditch D9
Flooded scrub blocks channel beyond here
Partially flooded scrub; branches overhang D9 channel
Waterlogged margin of scrub and patchy Phragmites australis
Waterlogged margin of scrub hedge (in poor state)
Phragmites australis
2
2
Ditch D8
Typha latifolia
2
2
Salix sp.
Patches of submerged & floating green algae in margins.
Overhanging shading scrub
Emergent approx. 70 % cover: Bolboschoenus maritimus
Steep bank
1
1
1
Emergent Phragmites australis
Emergent approx. 80 % cover: Bolboschoenus maritimus
Floating & submerged: Green algae
Occasional emergent: Bolboschoenus maritimus
Ditch D4
Open deep water
Emergent & marginal Phragmites australis
Marginal Phragmites australis
Not to scale
N
Sample habitats:
1. Flooded marginal area of Bolboschoenus maritimus: multiple sweep nets field sorted.
2. Emergent Phragmites australis and waterlogged scrub margins within D8.
3. Waterlogged scrub margins within D9.
Approximate position of bottle traps
Black Duck Marsh - North


Pond P5
Not to scale
N
Sample habitats:
1. Open water with submerged Chara vulgaris & submerged algae
2. Marginal emergent Phragmites australis with Juncus sp. & Typha latifolia.
Emergent Phragmites australis, submerged Chara vulgaris and floating algae. Flooded reedbed extending for some distance.
Juncus sp., Chara vulgaris, and wet grassy margins
Typha latifolia
Marginal Phragmites australis
Marginal Phragmites australis
Juncus sp.
Juncus sp. & approx. 5 % Phragmites australis
Phragmites australis
Open water with Chara vulgaris and occasional Phragmites australis
Substratum principally bare mud with occasional submerged Chara vulgaris. Submerged algae extensively covering submerged vegetation and substratum.
Flooded reedbed extending for some distance beyond pond margin.
Marginal Phragmites australis
Appox. 80 % Typha latifolia
Marginal approx. 95 % Phragmites australis approx. 5 % Typha latifolia
Juncus sp.
Juncus sp.
Approx. 30 % cover: Juncus sp. Lycopus europaeus Phragmites australis Rumex sp. Typha latifolia
Typha latifolia
Approx. 5 % emergent Alisma plantago-aquatica Phragmites australis
Marginal Phragmites australis
Approx. 95 % marginal Phragmites australis


Pond P6-N
Not to scale
N
Pond P6-S
Marginal Phragmites australis
Occasional Salix sp.
Emergent approx. 75 % cover:
Phragmites australis
Marginal approx. 95 % cover:
Phragmites australis
Occasional Salix sp.
Emergent approx 80 % cover:
Alisma plantago-aquatica
Bolboschoenus maritimus
Carex sp.
Eleocharis palustris
Emergent:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Marginal
Typha latifolia
Sample habitats:
1. Open water with submerged algae.
2. Marginal & emergent Bolboschoenus maritimus.
3. Marginal & emergent Phragmites australis.
Submerged green algae on soft clay substratum.
Dense zooplankton (Daphniidae) in water column.
Chara vulgaris present in summer 2015 absent in spring 2016
Phragmites australis & patches of submerged filamentous green algae
Marginal
Phragmites australis
Marginal
Typha latifolia
Emergent approx. 5 % cover:
Phragmites australis
Emergent:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Bolboschoenus maritimus
Carex sp.
Emergent approx 40 %:
Bolboschoenus maritimus
Carex sp.
Emergent:
Typha latifolia
Phragmites australis
Emergent approx. 95 % cover:
Bolboschoenus maritimus
Carex sp.
Phragmites australis
Emergent marginal:
Bolboschoenus maritimus
Carex sp.
Marginal Phragmites australis
Marginal Phragmites australis

Pond P6-S



Sample habitats:

1. Emergent *Typha angustifolia* & *Typha latifolia*.
2. Submerged *Potamogeton berchtoldii* & submerged algae.
(3. Submerged mixed submerged species mesohabitat from 2015 survey absent in spring 2016 - no sample taken.)
4. Marginal & emergent *Phragmites australis*.

Appendix 3 Survey data tables

Appendix 3 Table 1 Aquatic macroinvertebrate fauna recorded in the surveyed waterbodies (data for 2015 and 2016 surveys combined).

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	*BDM-W*	BDM-N-1	BDM-N-2	BDM-N-3	*BDM-N*
Polycentropodidae indet.	0	0	0	0	0	0	*0*	4	8	1	*13*
Total Polycentropidae	0	0	0	0	0	0	*0*	4	8	1	*13*
Agraylea multipunctata (Curtis)	0	0	0	0	0	0	*0*	2	0	0	*2*
Hydroptila sp.	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Hydroptilidae	0	0	0	0	0	0	*0*	2	0	0	*2*
Athripsodes aterrimus (Stephens)	0	0	0	0	0	0	*0*	0	0	1	*1*
Mystacides longicornis (L.)	0	0	0	0	0	0	*0*	0	0	1	*1*
Oecetis furva (Rambur)	0	0	0	0	0	0	*0*	0	0	1	*1*
Triaenodes bicolor (Curtis)	0	0	0	0	0	0	*0*	0	1	0	*1*
Total Leptoceridae	0	0	0	0	0	0	*0*	0	1	3	*4*
Anabolia nervosa (Curtis)	0	0	0	0	0	0	*0*	0	1	0	*1*
Glyphotaelius pellucidus (Retzius)	0	0	0	0	0	0	*0*	1	0	0	*1*
Limnephilus centralis, Curtis	0	0	0	0	0	0	*0*	0	0	0	*0*
Limnephilus lunatus, Curtis	0	0	0	1	1	4	*6*	0	0	5	*5*
Limnephilus marmoratus, Curtis	0	0	0	0	2	0	*2*	0	0	0	*0*
Limnephilus rhombicus (L.)	0	1	0	0	0	0	*1*	0	1	0	*1*
Limnephilus vittatus (Fabricius)	0	0	0	0	0	0	*0*	0	0	0	*0*
Limnephilidae indet.	0	0	0	27	6	9	*42*	20	8	71	*99*
Total Limnephilidae	0	1	0	28	9	13	*51*	21	10	76	*107*
Cloeon dipterum (L.)	0	1	0	117	0	95	*213*	125	250	254	*629*
Total Baetidae	0	1	0	117	0	95	*213*	125	250	254	*629*
Caenis horaria (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Caenis luctuosa (Burmeister)	0	0	0	0	0	0	*0*	1	0	0	*1*
Caenis robusta, Eaton	0	0	0	0	0	0	*0*	2	2	0	*4*
Total Caenidae	0	0	0	0	0	0	*0*	3	2	0	*5*
Aeshna cyanea (Müller)	0	0	0	0	0	0	*0*	0	0	0	*0*
Aeshna grandis (L.)	0	0	0	1	0	0	*1*	0	0	0	*0*
Aeshna mixta (Latreille)	0	0	0	0	0	0	*0*	0	0	0	*0*
Aeshna sp.	0	0	0	0	0	0	*0*	6	2	0	*8*
Anax imperator, Leach	0	0	0	0	0	0	*0*	0	0	0	*0*
Brachytron pratense (Müller)	0	0	0	0	0	0	*0*	0	0	0	*0*
Aeshnidae indet.	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Aeshnidae	0	0	0	1	0	0	*1*	6	2	0	*8*
Coenagrion puella (L.)	0	5	0	0	0	6	*11*	0	0	10	*10*
Ischnura elegans (Vander Linden)	0	0	0	0	0	0	*0*	26	17	4	*47*
Coenagrionidae indet.	0	2	0	0	0	58	*60*	9	0	6	*15*
Total Coenagrionidae	0	7	0	0	0	64	*71*	35	17	20	*72*
Lestes sponsa (Hansemann)	0	1	0	0	0	0	*1*	0	0	0	*0*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Lestes sp.	0	3	0	0	0	0	*3*	0	0	0	*0*
Total Lestidae	0	4	0	0	0	0	*4*	0	0	0	*0*
Libellula depressa, L.	0	0	0	0	0	0	*0*	0	0	0	*0*
Sympetrum striolatum (Charpentier)	0	0	0	2	0	0	*2*	0	0	0	*0*
Sympetrum sp.	0	0	0	5	9	0	*14*	0	0	0	*0*
Libellulidae indet.	0	1	0	0	0	0	*1*	0	0	0	*0*
Total Libellulidae	0	1	0	7	9	0	*17*	0	0	0	*0*
Sialis lutaria (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Sialidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Acilius sp.	0	0	0	0	0	0	*0*	4	2	0	*6*
Agabus bipustulatus (L.)	0	1	1	2	2	0	*6*	1	0	0	*1*
Agabus nebulosus (Forster)	0	0	1	1	0	0	*2*	0	0	1	*1*
Agabus sturmii (Gyllenhal)	0	0	0	0	0	0	*0*	0	0	0	*0*
Agabus/Ilybius larvae	3	11	0	88	0	1	*103*	58	9	3	*70*
Colymbetes fuscus (L.)	1	4	0	2	7	1	*15*	0	0	0	*0*
Colymbetinae group	0	0	0	0	0	0	*0*	2	0	0	*2*
Dytiscus circumflexus, Fabricius	0	0	0	0	0	0	*0*	2	0	0	*2*
Dytiscus sp.	0	5	1	8	5	2	*21*	15	5	5	*25*
Graphoderus sp.	0	0	2	7	0	3	*12*	9	0	0	*9*
Graptodytes bilineatus (Sturm)	0	1	0	2	4	0	*7*	0	0	0	*0*
Hydroporus angustatus,Sturm	0	0	1	0	0	0	*1*	0	0	1	*1*
Hydroporus erythrocephalus (L.)	0	0	0	0	17	0	*17*	0	0	2	*2*
Hydroporus incognitus, Sharp	0	0	0	1	0	0	*1*	0	0	0	*0*
Hydroporus nigrita (Fabricius)	0	0	0	2	4	0	*6*	0	0	0	*0*
Hydroporus palustris (L.)	0	0	0	0	21	1	*22*	0	1	1	*2*
Hydroporus planus (Fabricius)	0	0	1	0	0	0	*1*	0	0	0	*0*
Hydroporus sp.	5	0	0	1	32	0	*38*	1	16	0	*17*
Hydroporinae group	0	2	0	0	0	0	*2*	0	0	0	*0*
Hydrovatus cuspidatus (Kunze)	0	0	0	1	0	0	*1*	0	0	0	*0*
Hygrotus impressopunctatus (Schaller)	3	0	7	3	7	0	*20*	0	0	0	*0*
Hygrotus inaequalis (Fabricius)	3	14	3	26	13	12	*71*	6	0	6	*12*
Hygrotus versicolor (Schaller)	2	0	0	0	1	0	*3*	0	0	0	*0*
Hyphydrus ovatus (L.)	0	0	0	0	0	4	*4*	2	4	22	*28*
Ilybius fuliginosus (Fabricius)	0	0	0	1	0	1	*2*	0	0	0	*0*
Laccophilus hyalinus (De Geer)	0	0	0	1	0	0	*1*	0	0	0	*0*
Laccophilus minutus(L.)	1	0	1	1	0	0	*3*	0	5	0	*5*
Laccophilus sp.	2	2	4	0	0	0	*8*	16	0	1	*17*
Liopterus haemorrhoidalis (Fabricius)	0	0	1	1	0	0	*2*	0	0	0	*0*
Rhantus frontalis (Marsham)	0	0	1	1	2	1	*5*	0	1	0	*1*
Rhantus suturalis (MacLeay)	1	0	0	0	0	0	*1*	1	0	0	*1*
Rhantus sp.	3	14	1	4	0	3	*25*	16	2	0	*18*
Total Dytiscidae	24	54	25	153	115	29	*400*	133	45	42	*220*
Oulimnius tuberculatus (Müller)	0	0	0	0	0	0	*0*	0	0	2	*2*
Total Elmidae	0	0	0	0	0	0	*0*	0	0	2	*2*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Gyrinus caspius, Ménétriés	0	0	0	0	0	1	*1*	0	0	0	*0*
Gyrinus paykulli, Ochs	0	1	0	1	0	0	*2*	0	1	0	*1*
Gyrinus substriatus, Stephens	0	0	0	0	0	0	*0*	0	0	0	*0*
Gyrinus sp.	0	0	0	0	0	0	*0*	9	11	0	*20*
Total Gyrinidae	0	1	0	1	0	1	*3*	9	12	0	*21*
Haliplus apicalis, Thomson	0	7	1	2	0	0	*10*	0	0	0	*0*
Haliplus immaculatus, Gerhardt	0	0	0	0	0	0	*0*	0	0	0	*0*
Haliplus lineaticollis (Marsham)	0	0	0	1	0	0	*1*	2	1	21	*24*
Haliplus ruficollis (DeGeer)	0	0	0	0	31	4	*35*	1	8	0	*9*
Haliplus ruficollis group	1	6	5	46	44	1	*103*	0	0	1	*1*
Haliplus sibiricus, Motschulsky	0	0	0	0	3	0	*3*	0	0	0	*0*
Haliplus sp.	3	1	0	0	29	0	*33*	0	34	3	*37*
Peltodytes caesus (Duftschmid)	0	0	0	0	1	0	*1*	0	7	4	*11*
Total Haliplidae	4	14	6	49	108	5	*186*	3	50	29	*82*
Helophorus alternans, Gené	0	0	0	0	0	0	*0*	0	0	0	*0*
Helophorus brevipalpis, Bedel	0	0	1	0	0	0	*1*	8	0	0	*8*
Helophorus grandis, Illiger	0	0	0	2	1	0	*3*	1	0	1	*2*
Helophorus griseus, Herbst	0	0	0	0	0	0	*0*	0	0	0	*0*
Helophorus minutus, Fabricius	1	0	1	0	14	4	*20*	5	0	0	*5*
Helophorus nanus (Sturm)	0	0	0	0	0	0	*0*	0	0	0	*0*
Helophorus sp.	0	0	0	0	0	0	*0*	1	1	1	*3*
Total Helophoridae	1	0	2	2	15	4	*24*	15	1	2	*18*
Hydraena testacea, Curtis	0	0	0	0	0	0	*0*	0	0	0	*0*
Octhebius marinus (Paykull)	0	3	0	0	0	0	*3*	0	0	0	*0*
Ochthebius minimus (Fabricius)	2	0	0	21	61	0	*84*	0	0	59	*59*
Ochthebius viridus, Peyron	1	1	0	14	4	0	*20*	1	0	0	*1*
Total Hydraenidae	3	4	0	35	65	0	*107*	1	0	59	*60*
Hydrochus ignicollis (Motschulsky)	0	0	0	0	0	0	*0*	0	2	0	*2*
Total Hydrochidae	0	0	0	0	0	0	*0*	0	2	0	*2*
Anacaena bipustulata (Marsham)	0	0	0	0	0	0	*0*	4	0	2	*6*
Anacaena limbata (Fabricius)	0	2	0	9	44	0	*55*	15	4	39	*58*
Anacaena sp.	0	0	0	11	8	0	*19*	0	0	1	*1*
Berosus affinis (Brullé)	0	0	0	0	1	0	*1*	1	6	0	*7*
Berosus signaticollis (Charpentier)	0	0	0	9	0	0	*9*	0	0	0	*0*
Berosus sp.	0	0	0	0	0	0	*0*	3	0	0	*3*
Cercyon sternalis (Sharp)	0	0	0	0	0	0	*0*	1	0	0	*1*
Cercyon tristis(Illiger)	0	0	0	0	0	1	*1*	0	0	0	*0*
Cymbiodyta marginellus (Fabricius)	0	1	0	0	9	0	*10*	0	0	0	*0*
Enochrus bicolor (Fabricius)	1	0	0	0	0	0	*1*	0	0	0	*0*
Enochrus halophilus (Bedel)	1	1	0	0	0	0	*2*	1	0	0	*1*
Enochrus testaceus (Fabricius)	0	0	0	2	0	0	*2*	0	1	1	*2*
Enochrus sp.	0	0	0	0	5	0	*5*	0	0	0	*0*
Helochares lividus (Forster)	0	0	0	0	0	0	*0*	0	2	5	*7*
Hydrobius fuscipes (L.)	4	0	2	0	34	1	*41*	1	0	0	*1*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Hydrophilus piceus (L.)	0	0	0	0	17	0	*17*	0	0	0	*0*
Laccobius bipunctatus (Fabricius)	0	0	0	0	0	0	*0*	1	0	0	*1*
Laccobius colon (Stephens)	0	0	0	0	0	0	*0*	0	1	0	*1*
Laccobius minutus (L.)	0	0	0	13	0	0	*13*	0	0	0	*0*
Laccobius sp.	4	0	0	1	0	0	*5*	0	0	0	*0*
Hydrophilidae indet.	0	0	0	0	0	0	*0*	34	1	3	*38*
Total Hydrophilidae	10	4	2	45	118	2	*181*	61	15	51	*127*
Noterus clavicornis, De Geer	3	2	6	51	1	0	*63*	14	66	7	*87*
Total Noteridae	3	2	6	51	1	0	*63*	14	66	7	*87*
Hygrobia hermanni (Fabricius)	0	0	0	0	0	0	*0*	0	0	1	*1*
Total Paelobiidae	0	0	0	0	0	0	*0*	0	0	1	*1*
Scirtes sp.	0	0	0	0	480	0	*480*	0	0	0	*0*
Elodes sp.	0	0	0	0	0	1	*1*	0	0	0	*0*
Total Scirtidae	0	0	0	0	480	1	*481*	0	0	0	*0*
Anisosticta novemdecimpunctata (L.)	0	0	0	0	0	0	*0*	0	1	0	*1*
Total Coccinellidae	0	0	0	0	0	0	*0*	0	1	0	*1*
Arctocorisa germari (Fieber)	0	0	0	0	0	0	*0*	0	0	0	*0*
Callicorixa praeusta (Fieber)	62	66	16	4	0	28	*176*	4	5	8	*17*
Callicorixa sp.	0	17	0	9	0	0	*26*	0	2	5	*7*
Corixa affinis, Leach	0	0	0	0	0	0	*0*	0	0	0	*0*
Corixa affinis/dentipes	0	0	0	0	0	22	*22*	0	0	0	*0*
Corixa affinis/panzeri	0	0	0	0	0	0	*0*	0	0	0	*0*
Corixa punctata (Illiger)	0	2	0	0	1	0	*3*	1	1	16	*18*
Corixa punctata/iberica	28	13	13	0	0	38	*92*	1	0	0	*1*
Corixa sp.	34	0	8	17	3	0	*62*	0	1	0	*1*
Cymatia coleoptrata (Fabricius)	0	0	0	0	0	2	*2*	0	0	0	*0*
Cymatia sp.	0	0	0	0	0	43	*43*	0	0	0	*0*
Hesperocorixa linnaei (Fieber)	0	0	0	0	0	0	*0*	0	9	0	*9*
Hesperocorixa sahlbergi (Fieber)	19	1	0	0	0	3	*23*	0	3	0	*3*
Hesperocorixa sp.	42	0	0	0	0	0	*42*	0	0	0	*0*
Miconecta scholtzi (Fieber)	0	0	0	1	0	0	*1*	0	0	0	*0*
Micronecta sp.	0	0	0	89	0	0	*89*	0	0	0	*0*
Paracorixa concinna (Fieber)	81	0	0	0	7	0	*88*	0	11	12	*23*
Sigara distincta/falleni/fallenoida	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara dorsalis (Leach)	3	21	5	0	1	1	*31*	0	2	0	*2*
Sigara dorsalis/striata	0	16	4	0	0	13	*33*	0	0	0	*0*
Sigara falleni (Fieber)	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara falleni/iactans	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara fossarum (Leach)	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara iactans, Jansson	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara lateralis (Leach)	0	0	7	0	0	0	*7*	0	0	0	*0*
Sigara limitata (Fieber)	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara nigrolineata (Fieber)	0	0	0	0	0	0	*0*	0	0	0	*0*
Sigara selecta (Fieber)	0	0	0	0	0	0	*0*	0	0	0	*0*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Sigara sp.	182	222	12	77	0	0	*493*	2	0	0	*2*
Corixidae indet.	182	235	21	0	0	380	*818*	315	69	26	*410*
Total Corixidae	633	593	86	197	12	530	*2051*	323	103	67	*493*
Gerris lacustris (L.)	0	1	0	0	0	0	*1*	0	0	0	*0*
Gerris group	8	71	0	14	5	0	*98*	5	2	0	*7*
Total Gerridae	8	72	0	14	5	0	*99*	5	2	0	*7*
Hydrometra stagnorum (L.)	1	0	0	1	0	0	*2*	0	0	0	*0*
Total Hydrometridae	1	0	0	1	0	0	*2*	0	0	0	*0*
Ilyocoris cimicoides (L.)	0	17	0	21	11	0	*49*	0	0	0	*0*
Ilyocoris cimicoides / Naucoris maculatus	0	0	0	0	0	0	*0*	54	3	2	*59*
Total Naucoridae	0	17	0	21	11	0	*49*	54	3	2	*59*
Renatra linearis (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Nepidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Notonecta glauca, L.	0	2	1	0	0	0	*3*	0	1	0	*1*
Notonecta sp.	31	88	18	60	14	19	*230*	52	25	13	*90*
Total Notonectidae	31	90	19	60	14	19	*233*	52	26	13	*91*
Plea minutissima, Leach	1	9	1	154	0	130	*295*	252	106	179	*537*
Total Pleidae	1	9	1	154	0	130	*295*	252	106	179	*537*
Microvelia reticulata (Burmeister)	0	31	2	14	0	0	*47*	11	3	1	*15*
Microvelia sp.	0	5	0	0	0	0	*5*	1	0	0	*1*
Total Veliidae	0	36	2	14	0	0	*52*	12	3	1	*16*
Saldidae indet.	0	1	1	0	0	0	*2*	0	0	0	*0*
Total Saldidae	0	1	1	0	0	0	*2*	0	0	0	*0*
Asellus aquaticus (L.)	98	300	1	273	340	221	*1233*	122	99	76	*297*
Total Asellidae	98	300	1	273	340	221	*1233*	122	99	76	*297*
Total Cladocera [1]	1000	652	1000	444	0	1000	*1000*	112	193	42	*347*
Total Copepoda	0	1	4	0	0	0	*5*	7	1	2	*10*
Crangonyx pseudogracilis, Bousfield	0	0	14	0	0	0	*14*	0	0	0	*0*
Total Crangonyctidae	0	0	14	0	0	0	*14*	0	0	0	*0*
Gammarus duebeni, Liljeborg	0	0	0	0	0	0	*0*	0	0	0	*0*
Gammarus tigrinus, Sexton	0	0	0	0	0	0	*0*	0	0	0	*0*
Gammarus zaddachi, Sexton	0	0	0	0	0	0	*0*	0	0	0	*0*
Gammarus sp.	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Gammaridae	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Ostracoda	1000	19	144	10	21	97	*1291*	35	24	1	*60*
Bithynia tentaculata (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Bithyniidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Potamopyrgus antipodarum (Gray)	0	0	0	0	0	0	*0*	1	0	0	*1*
Total Hydrobiidae	0	0	0	0	0	0	*0*	1	0	0	*1*
Galba truncatula (Müller)	0	0	0	0	9	0	*9*	0	0	0	*0*
Lymnaea stagnalis (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Radix balthica (L.)	0	0	110	0	0	0	*110*	3285	1602	85	*4972*
Stagnicola fuscus agg. (Pfeiffer)	0	0	0	1	0	0	*1*	0	0	0	*0*
Total Lymnaeidae	0	0	110	1	9	0	*120*	3285	1602	85	*4972*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Physa group	99	133	54	122	360	36	*804*	124	228	209	*561*
Total Physidae	99	133	54	122	360	36	*804*	124	228	209	*561*
Planorbarius corneus (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Planorbis planorbis (L.)	0	0	0	0	0	0	*0*	0	0	0	*0*
Planorbis sp.	0	0	0	0	0	0	*0*	0	0	0	*0*
Gyraulus albus (Müller)	0	0	0	2	0	0	*2*	0	0	0	*0*
Gyraulus crista (L.)	66	402	0	96	226	155	*945*	501	289	120	*910*
Hippeutis complanatus(L.)	1	0	0	0	0	0	*1*	0	4	0	*4*
Planorbidae indet.	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Planorbidae	67	402	0	98	226	155	*948*	501	293	120	*914*
Pisidium spp.	0	0	0	0	0	0	*0*	1	0	0	*1*
Musculium lacustre (Müller)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Sphaeriidae	0	0	0	0	0	0	*0*	1	0	0	*1*
Total Succineidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Valvata cristata, Müller	0	0	0	2	0	0	*2*	0	0	0	*0*
Total Valvatidae	0	0	0	2	0	0	*2*	0	0	0	*0*
Total Ceratopogonidae	0	0	0	0	0	0	*0*	0	2	0	*2*
Chaoborus crystallinus (DeGeer)	0	0	0	0	0	0	*0*	0	0	10	*10*
Chaoborus flavicans (Meigen)	0	0	0	2	0	1	*3*	0	0	30	*30*
Chaoborus sp.	0	0	0	0	0	65	*65*	44	105	109	*258*
Total Chaoboridae	0	0	0	2	0	66	*68*	44	105	149	*298*
Total Chironomidae	431	776	474	228	457	1001	*3367*	844	362	975	*2181*
Culiseta moristans (Theobald)	1	0	0	0	0	0	*1*	0	0	0	*0*
Culisita sp.	1	0	0	0	0	0	*1*	0	0	0	*0*
Culex pipiens, L	0	0	0	0	0	5	*5*	0	0	0	*0*
Culicidae indet.	0	1	0	71	59	86	*217*	4	0	5	*9*
Total Culicidae	2	1	0	71	59	91	*224*	4	0	5	*9*
Dixa sp.	0	0	0	0	50	0	*50*	0	0	2	*2*
Dixella aestivalis (Meigen)	0	0	0	0	71	0	*71*	0	0	0	*0*
Dixella autumnalis (Meigen)	0	0	0	0	0	0	*0*	1	0	0	*1*
Dixidae indet.	0	16	2	0	0	0	*18*	0	0	0	*0*
Total Dixidae	0	16	2	0	121	0	*139*	1	0	2	*3*
Total Ephydridae	0	0	0	1	4	0	*5*	2	0	0	*2*
Total Limoniidae	0	5	0	0	0	6	*11*	2	3	24	*29*
Total Psychodidae	1	16	2	13	66	0	*98*	0	0	0	*0*
Total Ptychopteridae	0	0	0	0	1	0	*1*	0	0	0	*0*
Total Sciomyzidae	0	0	0	0	7	0	*7*	2	1	0	*3*
Odontomyia sp.	0	0	0	0	1	0	*1*	0	1	0	*1*
Oplodontha viridula (Fabricius)	0	0	0	0	0	0	*0*	1	0	0	*1*
Stratiomys singularior (Harris)	0	0	0	0	0	0	*0*	1	0	0	*1*
Stratiomys sp.	0	2	0	1	9	0	*12*	2	0	0	*2*
Stratiomyidae indet.	0	0	0	0	12	0	*12*	0	3	0	*3*
Total Stratiomyidae	0	2	0	1	22	0	*25*	4	4	0	*8*
Total Syrphidae	0	4	1	0	0	0	*5*	1	0	1	*2*

Taxon	BDM-W-1	BDM-W-2	BDM-W-3	BDM-W-4	BDM-W-5	BDM-W-6	***BDM-W***	BDM-N-1	BDM-N-2	BDM-N-3	***BDM-N***
Total Tipulidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Cataclysta lemnata (L.)	0	0	0	0	0	0	*0*	3	0	0	*3*
Total Pyralidae	0	0	0	0	0	0	*0*	3	0	0	*3*
Total Hydracarina	1	6	2	42	29	84	*164*	85	24	39	*148*
Helobdella stagnalis (L.)	0	0	0	0	1	0	*1*	0	0	0	*0*
Thermomyzon tessulatum (Müller)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Glossiphoniidae	0	0	0	0	1	0	*1*	0	0	0	*0*
Dendrocoelum lacteum (Müller)	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Dendrocoelidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Dugesia polychroa group	0	0	0	0	0	0	*0*	0	0	1	*1*
Total Dugesiidae	0	0	0	0	0	0	*0*	0	0	1	*1*
Polycelis nigra group	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Planariidae	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Oligochaeta	0	0	0	0	1	1	*2*	0	2	0	*2*
Total Nematoda	0	0	0	0	0	0	*0*	0	0	0	*0*
Total Hydrozoa	0	0	0	0	0	0	*0*	0	0	0	*0*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Polycentropodidae indet.	4	0	*4*	0	0	0	*0*	0	0	0	0	*0*
Total Polycentropidae	4	0	*4*	0	0	0	*0*	0	0	0	0	*0*
Agraylea multipunctata (Curtis)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroptila sp.	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Hydroptilidae	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Athripsodes aterrimus (Stephens)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Mystacides longicornis (L.)	0	0	*0*	0	1	0	*1*	0	1	0	0	*1*
Oecetis furva (Rambur)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Triaenodes bicolor (Curtis)	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Total Leptoceridae	0	0	*0*	0	1	1	*2*	0	1	0	0	*1*
Anabolia nervosa (Curtis)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Glyphotaelius pellucidus (Retzius)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilus centralis, Curtis	0	0	*0*	0	0	1	*1*	0	1	0	0	*1*
Limnephilus lunatus, Curtis	9	2	*11*	0	0	0	*0*	0	1	0	0	*1*
Limnephilus marmoratus, Curtis	0	0	*0*	0	3	0	*3*	0	0	0	0	*0*
Limnephilus rhombicus (L.)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Limnephilus vittatus (Fabricius)	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Limnephilidae indet.	19	43	*62*	0	0	4	*4*	1	0	0	1	*2*
Total Limnephilidae	28	45	*73*	0	4	5	*9*	1	2	0	1	*4*
Cloeon dipterum (L.)	320	120	*440*	14	12	21	*47*	19	0	86	51	*156*
Total Baetidae	320	120	*440*	14	12	21	*47*	19	0	86	51	*156*
Caenis horaria (L.)	0	0	*0*	0	0	0	*0*	0	0	0	4	*4*
Caenis luctuosa (Burmeister)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Caenis robusta, Eaton	0	0	*0*	0	0	4	*4*	0	0	2	0	*2*
Total Caenidae	0	0	*0*	0	0	4	*4*	0	0	2	4	*6*
Aeshna cyanea (Müller)	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Aeshna grandis (L.)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Aeshna mixta (Latreille)	1	4	*5*	0	0	0	*0*	0	0	0	0	*0*
Aeshna sp.	0	0	*0*	1	11	14	*26*	2	0	0	7	*9*
Anax imperator, Leach	0	0	*0*	0	1	5	*6*	0	0	0	1	*1*
Brachytron pratense (Müller)	0	0	*0*	0	1	0	*1*	0	0	0	1	*1*
Aeshnidae indet.	1	2	*3*	0	2	3	*5*	0	0	0	0	*0*
Total Aeshnidae	2	6	*8*	1	15	22	*38*	3	0	0	9	*12*
Coenagrion puella (L.)	0	9	*9*	0	13	3	*16*	0	0	0	4	*4*
Ischnura elegans (Vander Linden)	0	0	*0*	0	6	1	*7*	26	0	6	19	*51*
Coenagrionidae indet.	0	8	*8*	0	16	19	*35*	51	0	13	0	*64*
Total Coenagrionidae	0	17	*17*	0	35	23	*58*	77	0	19	23	*119*
Lestes sponsa (Hansemann)	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Lestes sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Lestidae	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Libellula depressa, L.	1	1	*2*	0	0	1	*1*	0	0	0	0	*0*
Sympetrum striolatum (Charpentier)	0	1	*1*	0	0	1	*1*	0	0	0	0	*0*
Sympetrum sp.	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Libellulidae indet.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Libellulidae	1	4	*5*	0	0	2	*2*	0	0	0	0	*0*
Sialis lutaria (L.)	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Sialidae	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Acilius sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus bipustulatus (L.)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus nebulosus (Forster)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Agabus sturmii (Gyllenhal)	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Agabus/Ilybius larvae	0	26	*26*	0	0	1	*1*	0	0	0	44	*44*
Colymbetes fuscus (L.)	2	0	*2*	0	3	0	*3*	0	0	0	2	*2*
Colymbetinae group	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dytiscus circumflexus, Fabricius	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dytiscus sp.	11	14	*25*	0	2	0	*2*	0	0	0	0	*0*
Graphoderus sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Graptodytes bilineatus (Sturm)	12	16	*28*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus angustatus,Sturm	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus erythrocephalus (L.)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus incognitus, Sharp	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus nigrita (Fabricius)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus palustris (L.)	0	5	*5*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus planus (Fabricius)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydroporus sp.	1	2	*3*	0	0	0	*0*	0	0	0	0	*0*
Hydroporinae group	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydrovatus cuspidatus (Kunze)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hygrotus impressopunctatus (Schaller)	1	3	*4*	0	0	0	*0*	0	0	1	1	*2*
Hygrotus inaequalis (Fabricius)	88	58	*146*	0	1	0	*1*	0	1	1	0	*2*
Hygrotus versicolor (Schaller)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hyphydrus ovatus (L.)	10	3	*13*	0	0	1	*1*	0	0	0	3	*3*
Ilybius fuliginosus (Fabricius)	0	0	*0*	0	0	0	*0*	0	1	0	0	*1*
Laccophilus hyalinus (De Geer)	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Laccophilus minutus(L.)	0	9	*9*	0	0	1	*1*	0	1	0	1	*2*
Laccophilus sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Liopterus haemorrhoidalis (Fabricius)	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Rhantus frontalis (Marsham)	11	0	*11*	0	0	0	*0*	0	0	0	0	*0*
Rhantus suturalis (MacLeay)	2	0	*2*	0	0	0	*0*	0	0	0	1	*1*
Rhantus sp.	4	6	*10*	0	1	0	*1*	0	0	0	0	*0*
Total Dytiscidae	143	145	*288*	0	7	3	*10*	0	3	2	52	*57*
Oulimnius tuberculatus (Müller)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Elmidae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus caspius, Ménétriés	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus paykulli, Ochs	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Gyrinus substriatus, Stephens	0	1	*1*	0	0	0	*0*	0	0	0	1	*1*
Gyrinus sp.	0	0	*0*	0	8	3	*11*	0	0	0	0	*0*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Gyrinidae	0	2	*2*	0	8	3	*11*	0	0	0	1	*1*
Haliplus apicalis, Thomson	1	1	*2*	0	0	0	*0*	0	0	0	0	*0*
Haliplus immaculatus, Gerhardt	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Haliplus lineaticollis (Marsham)	3	7	*10*	0	0	0	*0*	0	0	0	0	*0*
Haliplus ruficollis (DeGeer)	58	61	*119*	0	0	0	*0*	0	9	0	0	*9*
Haliplus ruficollis group	10	47	*57*	0	3	0	*3*	0	2	0	0	*2*
Haliplus sibiricus, Motschulsky	9	6	*15*	0	0	0	*0*	0	2	0	0	*2*
Haliplus sp.	0	16	*16*	0	0	0	*0*	0	1	0	1	*2*
Peltodytes caesus (Duftschmid)	2	3	*5*	0	1	0	*1*	0	0	0	0	*0*
Total Haliplidae	83	141	*224*	0	4	0	*4*	0	14	0	2	*16*
Helophorus alternans, Gené	0	2	*2*	0	0	0	*0*	0	2	1	0	*3*
Helophorus brevipalpis, Bedel	0	9	*9*	0	0	63	*63*	18	0	14	1	*33*
Helophorus grandis, Illiger	0	6	*6*	0	0	0	*0*	0	0	0	0	*0*
Helophorus griseus, Herbst	0	1	*1*	0	0	2	*2*	0	0	0	0	*0*
Helophorus minutus, Fabricius	0	3	*3*	0	6	0	*6*	0	6	11	6	*23*
Helophorus nanus (Sturm)	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Helophorus sp.	1	12	*13*	0	0	0	*0*	0	0	19	0	*19*
Total Helophoridae	1	33	*34*	0	7	65	*72*	18	8	45	7	*78*
Hydraena testacea, Curtis	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Octhebius marinus (Paykull)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Ochthebius minimus (Fabricius)	0	19	*19*	0	0	6	*6*	1	0	0	0	*1*
Ochthebius viridus, Peyron	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Total Hydraenidae	0	20	*20*	0	1	6	*7*	1	0	0	0	*1*
Hydrochus ignicollis (Motschulsky)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Hydrochidae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anacaena bipustulata (Marsham)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anacaena limbata (Fabricius)	0	71	*71*	0	0	0	*0*	0	0	0	0	*0*
Anacaena sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Berosus affinis (Brullé)	0	5	*5*	24	10	2	*36*	0	2	11	0	*13*
Berosus signaticollis (Charpentier)	1	8	*9*	2	2	0	*4*	0	2	0	0	*2*
Berosus sp.	2	16	*18*	7	0	0	*7*	0	0	0	0	*0*
Cercyon sternalis (Sharp)	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Cercyon tristis(Illiger)	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Cymbiodyta marginellus (Fabricius)	2	5	*7*	0	0	0	*0*	0	0	0	0	*0*
Enochrus bicolor (Fabricius)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Enochrus halophilus (Bedel)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Enochrus testaceus (Fabricius)	3	0	*3*	0	0	0	*0*	0	0	0	0	*0*
Enochrus sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Helochares lividus (Forster)	2	0	*2*	0	0	0	*0*	0	0	0	0	*0*
Hydrobius fuscipes (L.)	0	10	*10*	0	0	0	*0*	1	0	0	3	*4*
Hydrophilus piceus (L.)	0	2	*2*	0	0	0	*0*	0	0	0	0	*0*
Laccobius bipunctatus (Fabricius)	0	0	*0*	0	0	0	*0*	0	1	0	0	*1*
Laccobius colon (Stephens)	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Laccobius minutus (L.)	0	1	*1*	0	0	0	*0*	0	1	0	0	*1*
Laccobius sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Hydrophilidae indet.	0	14	*14*	0	3	1	*4*	0	4	0	0	*4*
Total Hydrophilidae	11	132	*143*	33	15	4	*52*	1	10	11	4	*26*
Noterus clavicornis, De Geer	0	85	*85*	0	4	5	*9*	1	0	1	2	*4*
Total Noteridae	0	85	*85*	0	4	5	*9*	1	0	1	2	*4*
Hygrobia hermanni (Fabricius)	2	0	*2*	0	0	0	*0*	0	0	0	0	*0*
Total Paelobiidae	2	0	*2*	0	0	0	*0*	0	0	0	0	*0*
Scirtes sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Elodes sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Scirtidae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Anisosticta novemdecimpunctata (L.)	0	0	*0*	0	3	1	*4*	0	0	0	0	*0*
Total Coccinellidae	0	0	*0*	0	3	1	*4*	0	0	0	0	*0*
Arctocorisa germari (Fieber)	0	0	*0*	0	1	3	*4*	0	0	0	0	*0*
Callicorixa praeusta (Fieber)	12	0	*12*	0	9	2	*11*	0	10	0	0	*10*
Callicorixa sp.	0	5	*5*	0	2	0	*2*	0	7	0	0	*7*
Corixa affinis, Leach	0	0	*0*	1	0	0	*1*	0	1	0	0	*1*
Corixa affinis/dentipes	0	0	*0*	0	9	0	*9*	1	0	0	2	*3*
Corixa affinis/panzeri	6	3	*9*	0	0	0	*0*	0	0	0	0	*0*
Corixa punctata (Illiger)	38	0	*38*	0	0	0	*0*	0	6	19	0	*25*
Corixa punctata/iberica	37	6	*43*	3	28	1	*32*	40	0	14	9	*63*
Corixa sp.	0	8	*8*	19	41	18	*78*	0	8	83	5	*96*
Cymatia coleoptrata (Fabricius)	2	0	*2*	0	0	0	*0*	0	1	2	0	*3*
Cymatia sp.	0	0	*0*	0	0	0	*0*	0	14	12	0	*26*
Hesperocorixa linnaei (Fieber)	9	2	*11*	7	0	0	*7*	0	0	0	0	*0*
Hesperocorixa sahlbergi (Fieber)	7	3	*10*	0	0	0	*0*	0	0	4	0	*4*
Hesperocorixa sp.	0	27	*27*	21	18	0	*39*	0	0	0	0	*0*
Micronecta scholtzi (Fieber)	0	0	*0*	0	0	0	*0*	23	0	0	0	*23*
Micronecta sp.	0	0	*0*	0	0	0	*0*	63	0	0	0	*63*
Paracorixa concinna (Fieber)	8	9	*17*	83	4	0	*87*	0	0	0	4	*4*
Sigara distincta/falleni/fallenoida	10	2	*12*	0	0	0	*0*	0	0	0	0	*0*
Sigara dorsalis (Leach)	3	3	*6*	19	16	4	*39*	0	2	9	0	*11*
Sigara dorsalis/striata	39	5	*44*	0	0	18	*18*	0	22	3	0	*25*
Sigara falleni (Fieber)	1	2	*3*	0	0	0	*0*	6	2	0	0	*8*
Sigara falleni/iactans	0	1	*1*	0	0	0	*0*	0	8	0	0	*8*
Sigara fossarum (Leach)	0	0	*0*	0	0	0	*0*	3	0	0	0	*3*
Sigara iactans, Jansson	0	0	*0*	12	5	2	*19*	0	3	0	0	*3*
Sigara lateralis (Leach)	36	0	*36*	51	2	14	*67*	0	0	0	0	*0*
Sigara limitata (Fieber)	0	0	*0*	0	9	0	*9*	0	0	0	0	*0*
Sigara nigrolineata (Fieber)	0	0	*0*	0	12	0	*12*	0	0	0	0	*0*
Sigara selecta (Fieber)	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Sigara sp.	0	0	*0*	144	103	0	*247*	92	15	130	86	*323*
Corixidae indet.	542	129	*671*	180	92	58	*330*	0	13	104	64	*181*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Corixidae	750	205	*955*	540	351	120	*1011*	229	112	380	170	*891*
Gerris lacustris (L.)	0	4	*4*	0	3	0	*3*	0	0	0	3	*3*
Gerris group	1	123	*124*	0	71	55	*126*	11	3	3	27	*44*
Total Gerridae	1	127	*128*	0	74	55	*129*	11	3	3	30	*47*
Hydrometra stagnorum (L.)	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Total Hydrometridae	0	0	*0*	0	0	0	*0*	0	0	0	1	*1*
Ilyocoris cimicoides (L.)	9	0	*9*	0	61	69	*130*	0	0	21	9	*30*
Ilyocoris cimicoides / Naucoris maculatus	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Naucoridae	9	0	*9*	0	61	69	*130*	0	0	21	9	*30*
Renatra linearis (L.)	0	2	*2*	0	1	0	*1*	0	0	0	0	*0*
Total Nepidae	0	2	*2*	0	1	0	*1*	0	0	0	0	*0*
Notonecta glauca, L.	5	0	*5*	0	0	0	*0*	0	0	0	0	*0*
Notonecta sp.	5	27	*32*	91	81	125	*297*	97	58	9	95	*259*
Total Notonectidae	10	27	*37*	91	81	125	*297*	97	58	9	95	*259*
Plea minutissima, Leach	183	96	*279*	62	147	73	*282*	9	49	98	17	*173*
Total Pleidae	183	96	*279*	62	147	73	*282*	9	49	98	17	*173*
Microvelia reticulata (Burmeister)	0	19	*19*	0	30	18	*48*	8	0	34	2	*44*
Microvelia sp.	4	2	*6*	0	43	91	*134*	2	0	52	0	*54*
Total Veliidae	4	21	*25*	0	73	109	*182*	10	0	86	2	*98*
Saldidae indet.	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Total Saldidae	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Asellus aquaticus (L.)	22	97	*119*	13	71	42	*126*	380	1	82	126	*589*
Total Asellidae	22	97	*119*	13	71	42	*126*	380	1	82	126	*589*
Total Cladocera [1]	340	1	*341*	1000	2	5	*1000*	0	0	1000	18	*1000*
Total Copepoda	1	0	*1*	0	137	0	*137*	0	0	0	163	*163*
Crangonyx pseudogracilis, Bousfield	0	3	*3*	0	3	0	*3*	41	0	18	6	*65*
Total Crangonyctidae	0	3	*3*	0	3	0	*3*	41	0	18	6	*65*
Gammarus duebeni, Liljeborg	0	0	*0*	176	13	0	*189*	19	8	137	0	*164*
Gammarus tigrinus, Sexton	0	0	*0*	1	0	8	*9*	0	0	0	0	*0*
Gammarus zaddachi, Sexton	0	0	*0*	0	0	0	*0*	4	0	0	0	*4*
Gammarus sp.	1	2	*3*	82	51	136	*269*	18	11	222	3	*254*
Total Gammaridae	1	2	*3*	259	64	144	*467*	41	19	359	3	*422*
Total Ostracoda	20	24	*44*	21	69	34	*124*	0	0	19	19	*38*
Bithynia tentaculata (L.)	5	43	*48*	5	8	11	*24*	47	10	7	3	*67*
Total Bithyniidae	5	43	*48*	5	8	11	*24*	47	10	7	3	*67*
Potamopyrgus antipodarum (Gray)	0	10	*10*	0	0	18	*18*	90	31	0	11	*132*
Total Hydrobiidae	0	10	*10*	0	0	18	*18*	90	31	0	11	*132*
Galba truncatula (Müller)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Lymnaea stagnalis (L.)	0	135	*135*	0	0	0	*0*	0	0	0	0	*0*
Radix balthica (L.)	130	1180	*1310*	80	125	108	*313*	240	99	108	177	*624*
Stagnicola fuscus agg. (Pfeiffer)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Lymnaeidae	130	1315	*1445*	80	125	108	*313*	240	99	108	177	*624*
Physa group	97	117	*214*	0	75	69	*144*	12	23	72	28	*135*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Physidae	97	117	*214*	0	75	69	*144*	12	23	72	28	*135*
Planorbarius corneus (L.)	0	0	*0*	0	0	0	*0*	0	0	0	12	*12*
Planorbis planorbis (L.)	18	91	*109*	0	6	3	*9*	94	4	0	17	*115*
Planorbis sp.	1	0	*1*	0	0	0	*0*	0	0	0	0	*0*
Gyraulus albus (Müller)	0	0	*0*	0	0	0	*0*	0	0	4	0	*4*
Gyraulus crista (L.)	221	0	*221*	0	0	0	*0*	0	0	183	30	*213*
Hippeutis complanatus(L.)	0	0	*0*	0	8	0	*8*	0	0	0	1	*1*
Planorbidae indet.	1	0	*1*	0	0	12	*12*	0	0	0	0	*0*
Total Planorbidae	241	91	*332*	0	14	15	*29*	94	4	187	60	*345*
Pisidium spp.	0	0	*0*	0	0	0	*0*	0	0	8	0	*8*
Musculium lacustre (Müller)	0	0	*0*	0	0	0	*0*	3	0	0	0	*3*
Total Sphaeriidae	0	0	*0*	0	0	0	*0*	3	0	8	0	*11*
Total Succineidae	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Valvata cristata, Müller	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Valvatidae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Ceratopogonidae	3	5	*8*	0	0	0	*0*	0	0	1	0	*1*
Chaoborus crystallinus (DeGeer)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Chaoborus flavicans (Meigen)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Chaoborus sp.	80	0	*80*	0	0	0	*0*	0	0	0	0	*0*
Total Chaoboridae	80	0	*80*	0	0	0	*0*	0	0	0	0	*0*
Total Chironomidae	400	839	*1239*	1000	110	51	*1161*	535	391	380	485	*1791*
Culiseta moristans (Theobald)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culisita sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culex pipiens, L	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Culicidae indet.	70	50	*120*	0	0	0	*0*	0	0	0	0	*0*
Total Culicidae	70	50	*120*	0	0	0	*0*	0	0	0	0	*0*
Dixa sp.	8	0	*8*	0	0	0	*0*	0	0	0	0	*0*
Dixella aestivalis (Meigen)	11	1	*12*	0	0	2	*2*	0	0	0	1	*1*
Dixella autumnalis (Meigen)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Dixidae indet.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Dixidae	19	1	*20*	0	0	2	*2*	0	0	0	1	*1*
Total Ephydridae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Limoniidae	9	0	*9*	0	2	2	*4*	0	0	0	3	*3*
Total Psychodidae	0	0	*0*	0	34	4	*38*	22	0	0	1	*23*
Total Ptychopteridae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Total Sciomyzidae	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Odontomyia sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Oplodontha viridula (Fabricius)	0	1	*1*	0	0	0	*0*	0	0	0	0	*0*
Stratiomys singularior (Harris)	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Stratiomys sp.	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*
Stratiomyidae indet.	1	7	*8*	0	0	0	*0*	0	0	0	0	*0*
Total Stratiomyidae	1	8	*9*	0	0	0	*0*	0	0	0	0	*0*
Total Syrphidae	0	0	*0*	0	0	0	*0*	0	0	0	0	*0*

Taxon	P5-1	P5-2	*P5*	P6-N-1	P6-N-2	P6-N-3	*P6-N*	P6-S-1	P6-S-2	P6-S-3	P6-S-4	*P6-S*
Total Tipulidae	0	0	*0*	0	1	0	*1*	0	0	0	0	*0*
Cataclysta lemnata (L.)	6	0	*6*	0	0	0	*0*	0	0	0	0	*0*
Total Pyralidae	6	0	*6*	0	0	0	*0*	0	0	0	0	*0*
Total Hydracarina	21	11	*32*	0	18	0	*18*	0	82	15	4	*101*
Helobdella stagnalis (L.)	0	0	*0*	0	0	0	*0*	18	1	0	0	*19*
Thermomyzon tessulatum (Müller)	0	0	*0*	0	0	1	*1*	0	0	0	0	*0*
Total Glossiphoniidae	0	0	*0*	0	0	1	*1*	18	1	0	0	*19*
Dendrocoelum lacteum (Müller)	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Total Dendrocoelidae	0	0	*0*	0	0	0	*0*	1	0	0	0	*1*
Dugesia polychroa group	0	2	*2*	0	0	4	*4*	70	0	45	19	*134*
Total Dugesiidae	0	2	*2*	0	0	4	*4*	70	0	45	19	*134*
Polycelis nigra group	0	0	*0*	0	0	0	*0*	183	0	0	0	*183*
Total Planariidae	0	0	*0*	0	0	0	*0*	183	0	0	0	*183*
Total Oligochaeta	8	8	*16*	0	0	37	*37*	1	1	15	0	*17*
Total Nematoda	0	0	*0*	0	0	2	*2*	0	3	0	0	*3*
Total Hydrozoa	0	2	*2*	0	0	1	*1*	0	0	0	0	*0*

Note: Abundances are provided for each mesohabitat, where applicable; data for compounded samples (representing entire waterbody) are provided in italics.
P6-S-4 was only surveyed in 2015; data therefore represents a single season survey for this mesohabitat.

[1] An abundance of 1000 indicates an abundance of >1000.

Where appropriate, abundances of certain taxa (Mollusc species and Chironomidae) have been estimated from a sub-sample.

Annex EDP 32
Fish survey of Swanscombe Marshes (Colclough and Coates, 2015)

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London Paramount Entertainment Resort

A Fish Survey of Swanscombe Marshes

September 2015

Aerial photograph courtesy of LRCH

Plate 1 Swanscombe Marshes

Draft Report 14th December, 2015

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SC^2 Reference: **CB/004**

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CONTENTS

1.0 SUMMARY

1.0.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.0.2 Colclough & Coates - SC^2 have been contracted to provide a survey of the fish communities associated with Swanscombe Marshes. Other commissioned works related to this proposal include: - a desk based review of the estuarine fish communities around Swanscombe Peninsula; a survey of fish associated with saltmarshes around the Peninsula; a study of fish in the Ebbsfleet Stream.

1.1 Scope of Survey

1.1.1 Virtually all of the open freshwater waterbodies in Swanscombe Marshes were subject to visual walk over surveys on 19th April, 19th June and 26th June 2015. Electrofishing gear was deployed at suitable locations in Swanscombe Marshes on 15th August 2015. Hand net sampling was conducted at a number of locations in Swanscombe Marshes and the western edge of Botany Marshes on the same date. Fyke nets were set overnight in the same locations as the earlier electrofishing operations on 11/12th September, 2015. Information was also drawn from the only ever Environment Agency fish survey in the marshes, which took place in 2007.

1.2 Survey Limitations

1.2.1 Site access proved to be the greatest limitation. The sites fished represented most of the open water sites where electrofishing and fyke netting proved practicable. Hand netting proved to be possible on an opportunistic basis at a number of small sites, but efficiency of capture was low, given channel overgrowth.

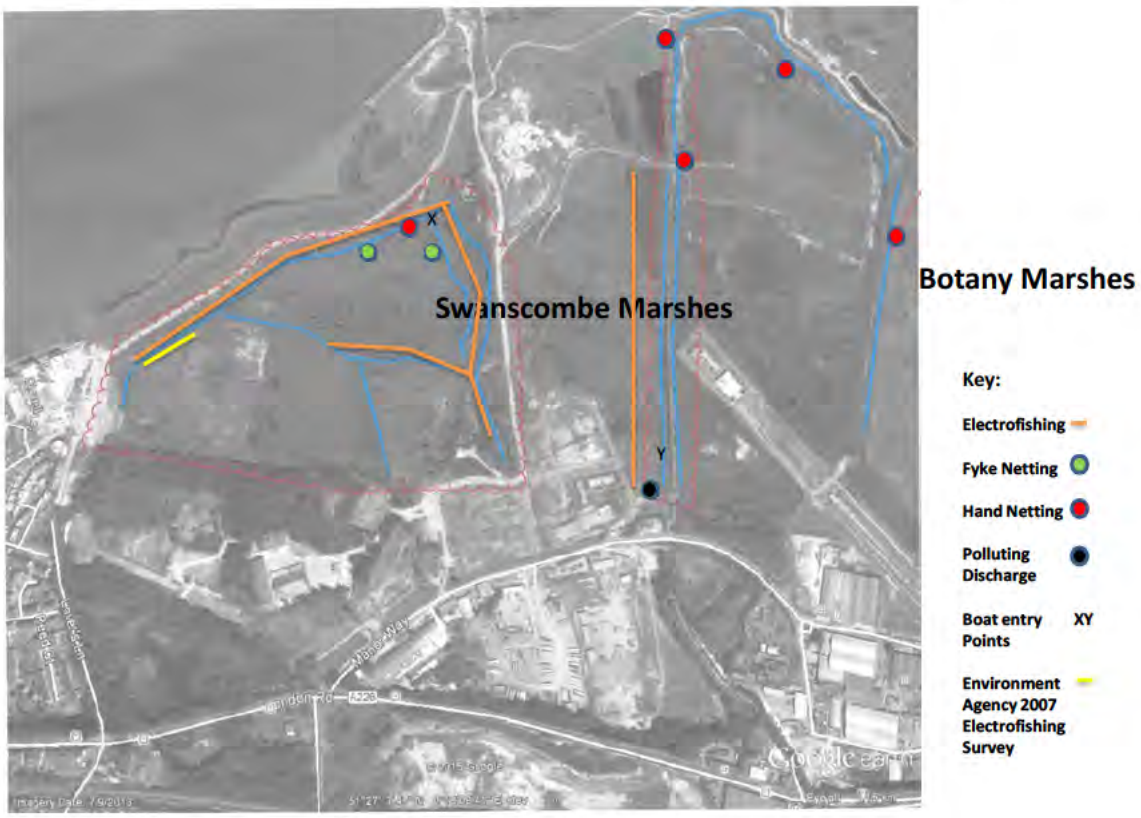
1.3 Key Findings

1.3.1 Three-spined stickleback *Gasterosteus aculeatus* were present in isolated locations in the eastern complex of Swanscombe Marshes. No fish were captured anywhere in the western complex of Swanscombe Marshes in spite of extensive coverage with electrofishing gear and fyke nets. Corixids, great diving beetle *Dytiscus marginalis* and the late larvae *of s*mooth newt *Lissotriton vulgaris* were noted commonly in one small area of marsh partly connected to the marsh channels, but were not evident in the main channels adjacent. Water levels in the western complex of Swanscombe Marshes appear to be unstable and dropped significantly between April and September 2015. Fyke net recoveries indicated anaerobic bed conditions. Dense blooms of *Daphnia* were in evidence in Swanscombe Marshes during August & September. Some evidence of a polluting discharge was noted at the southern end of the more westerly of the twin channels in the eastern complex of Swanscombe Marshes.

2.0 INTRODUCTION

2.0.1 To inform the Environmental Impact Assessment, Colclough & Coates – SC^2 have been engaged to provide a fish survey of the fish communities which are associated with the freshwater marshes on Swanscombe Peninsula. Salient features of the survey can be seen in Figure 1.

Figure 1 Fish Sampling Sites on Swanscombe Marshes



Developed from an image from LRCH

2.1 Swanscombe Marshes

2.1.1 Swanscombe Peninsula has a long industrial history, mainly connected with the cement industry. Swanscombe Marshes (also known as Black Duck Marshes) were originally saltmarsh, isolated progressively from the tidal Thames by sea defence structures some of which date back several hundred years. The sea wall was breached in the 1953 storm surge event.

2.1.2 The cement works have now gone, to be replaced with infrastructure associated with the CTRL link. There is small disused sewage treatment plant close to the CTRL infrastructure. Part of the site has been subject to past landfill and has

been raised. Kiln dust associated with the cement operations was tipped in the area around the head of the peninsula. (Gravesham Local Plan Core Strategy, 2013).

2.1.3 There are no formal biodiversity designations in the marshes, but recent research indicates that there are nature conservation interests on the peninsula. Marsh harriers have been spotted in recent years and there is a heronry associated with a small woodland area. (Gravesham Local Plan Core Strategy, 2013).

2.1.4 There is no verified information on the current status of fish life in the freshwater marshes on the Peninsula. Fish were thought to be present in both Swanscombe and Botany Marshes.

3.0 FISH SURVEY METHODOLOGY

3.1 Walk over survey

3.1.1 Virtually all of the open freshwater waterbodies on the Peninsula were subject to visual walk over surveys. These took place on 19th April, 19th June and 26th June 2015. Photographs taken from the surveys appear in Appendix 1.

3.1.2 From these investigations it was evident that conventional fish survey equipment could only be applied at a very few locations. Hand netting would be attempted at some of the smaller isolated sites where small fish were observed during the walk over surveys. The sites where all of the fishing operations were conducted appear in Figure 1 above. Photographs of the fishing methods and fish captured appear in Appendix 2.

3.2 Electrofishing

3.2.1 Fishing was conducted with 230v regulated 2.75kva pulsed DC electrofishing equipment provided by Fisheries Solutions. The equipment was boat based with a single anode. Most of the channel features in Swanscombe Marshes, highlighted in blue in Figure 1 were fished out and back from a boat entry point at X in Figure 1 on August 15th, 2015. No stop nets were deployed in these channels. Occasional debris blocks tended to isolate particular sections of channel.

3.2.2 Later in the same day, the electrofishing equipment was deployed in a similar manner on the western channel of the twin parallel channels in the eastern complex of Swanscombe Marshes, for the distance marked in orange in Figure 1, again out and back from entry point Y.

3.3 Fyke netting

3.3.1 Paired fyke nets (7 hoop double D, total length 10.6m otter guards fitted in first inscale) were set overnight on September 11/12th, 2015 in the locations marked in green in Figure 1.

3.4 Hand Netting

3.4.1 A standard biologists kick net (250mm wide frame, 300mm deep mesh bag with 1mm mesh throughout) was applied at the locations shown in red in Figure 1 on September 11th & 12th .

3.4.2 Captured fish were held in oxygenated tanks during the survey operations. All fish were later identified, measured to the nearest millimetre and returned to the water.

4.0 RESULTS

4.0.1 Three-spined stickleback *Gasterosteus aculeatus* were found to in small numbers at all of the sites shown in red in Figure 1 in Swanscombe Marshes and on the western edge of Botany Marshes. No fish at all were captured, or seen, in the electrofishing operations in the western complex in Swanscombe Marshes, in spite of shallow (less than 1m) clear conditions on a bright day. No fish were recovered from the fyke nets set out in these marshes either. Recovery of the fykes indicated that bed conditions in the channels were anaerobic. Very dense blooms of *Daphnia* were observed throughout the main channels during both the electrofishing and fyke netting operations.

4.0.2 Corixids, Great Diving Beetle *Dytiscus marginalis* and the late larvae of smooth newt *Lissotriton vulgaris* were noted commonly in one small raised area of marsh partly connected to the main channels, close to boat entry point X in Figure 1. These species were not captured or seen in the main channels adjacent, or indeed at any other survey site. Water levels in Swanscombe Marshes were noted to have dropped significantly between April and September 2015.

4.0.3 Neither electrofishing nor fyke netting yielded any fish at all in the western twin channel in the eastern complex. During the electrofishing operation, there was evidence of a discoloured discharge entering the southern end of the channel. Again, very heavy Daphnia blooms were in evidence in the channel. Fyke net recovery indicated anaerobic bed conditions.

4.0.4 The only ever Environment Agency survey in Swanscombe Marshes was conducted on 11th July, 2007. A three catch depletion electrofishing operation was mounted over a 100m section isolated with stop nets. No fish were captured at all. The survey team reported a heavy silt burden. The site was fished from TQ 59605 75457 to TQ59671 75510. This is shown in Figure 1 in yellow, towards the western end of Swanscombe Marshes.

5.0 EVALUATION OF THE RESOURCE

5.0.1 The habitat available in Swanscombe Marshes would suggest it is capable of supporting a community of freshwater cyprinids and eels, as reported from other freshwater marsh dyke systems adjacent to the Thames estuary (NRA 1990 & 1995).

5.0.2 Water quality information provided by CBA from the Lefarge monitoring programme for the eastern complex at Swanscombe Marshes indicated some saline intrusion with a gradient falling away from the sea defences. This situation occurs in many other marsh systems along the Thames estuary. (NRA 1990 & 1995). Brackish conditions would have hampered the electrofishing operations given the elevated conductivity, but the gear would still have worked efficiently away from the sea walls. If significant numbers of fish were present, they would have been at least seen during the electrofishing and taken in the fyke nets.

5.0.3 One other interesting observation was that water levels in the western complex appear to be unstable. Google Earth images of the western complex in Swanscombe Marshes show extensive dry vegetated ground with defined drainage channels from 1940 to at least 2010. The 2013 image clearly shows flooding of the site, which has progressed further by the time of the current April, 2015 image. Photographs in Appendix 1 demonstrate die back of some shrubs, which can be consistent with changing water and/or salinity levels. Some of the same photographs show that water levels dropped significantly from April 2015 to August, 2015. In short, the site has the appearance of a developing marsh, but with unstable conditions.

5.0.4 If saline intrusion is occurring and increases in future, there are few fish other than the eel *Anguilla anguilla* that can thrive in such brackish marshy conditions. If the intrusion stabilises, then with greater maturity Swanscombe Marshes could support a significant head of fish typical of freshwater grazing marshes, such as eel, rudd (*Scardinius erythropthalmus),* crucian carp (*Carassius carassius*) and tench (*Tinca tinca*). These communities do exist elsewhere in similar conditions adjacent to the Thames estuary (NRA 1990 & 1995).

6.0 CONCLUSIONS

6.0.1 Swanscombe Marshes supports a very poor head of fish. The reasons for this are not clear at present. However, anaerobic bed conditions, saline intrusion, unstable water levels and polluting discharges may be implicated at least in some areas. It is also possible that the western complex is a “new” marsh in the early stages of development. Greater maturity and stability might well see the marsh support a significant head of typical fish species in the future.

7.0 REFERENCES

Swanscombe Peninsula Position Statement May 2013 Submission Gravesham Local Plan Core Strategy May 2013

National Rivers Authority. (1990 & 1995). A Fish Population Survey of the Marsh Dykes, Thamesmead. .

8.1 Appendix 1 Photographs of Swanscombe Marshes

Western Complex

Notes: Top left & top right – April, 2015. Centre – 19th June, 2015. Note die back. Bottom – 15th August, 2015. Note reduced water level (approx.. 50cm).

8.1 Appendix 1 Photographs of Swanscombe Marshes

Eastern Complex

Notes: Top left & right - western channel 15th August 2015.Note whitish polluted discharge near southern head of channel at top left.

Bottom left - August 15th, 2015. Typical small open water area in eastern complex that held numbers of 3 spined stickleback.

8.2 Appendix 2 Fishing Methods

Electrofishing

Fyke Netting

Notes: Top left - Swanscombe Marshes, Western complex.

Top right - western channel of eastern complex.

8.2 Appendix 2 Fishing Methods

Hand netting

Notes: Top left and right - 15th August, 2015. Small semi- isolated area of raised marsh supporting a range of fauna but not fish.

Bottom left - Great diving beetle *Dytiscus marginalis* taken at above site.

Bottom right - Three-spined stickleback *Gasterosteus aculeastus* taken in eastern complex.

Annex EDP 33
Fish survey of the Ebbsfleet Stream (Colclough and Coates, 2015)

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London Paramount Entertainment Resort

A Fish Survey of the Ebbsfleet Stream

September 2015

Aerial photograph courtesy of LRCH

Plate 1 Adult Perch *Perca fluviatilis*

Draft Report 14th December, 2015

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1.0 SUMMARY

1.0.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.0.2 The upper section of the Ebbsfleet Stream may be impacted as a result of the proposed development of a new access route from the A2 trunk road. The Environment Agency has limited information on the current status of fish communities associated with this watercourse. Colclough & Coates – SC^2 has been contracted by CBA to conduct a fish survey and report on the findings. Site investigations and access arrangements were conducted during July & August 2015. The survey fieldwork was conducted on 11/12 September, 2015.

1.1 Scope of Survey

1.1.1 Most of the watercourse from Springhead Nurseries downstream to the crossing point of the North Kent rail line at Northfleet was subject to visual survey. Electrofishing and fyke nets were deployed at two adjacent sites close to the A226 Thames Way/A2260 junction. Information was drawn from the only past Environment Agency survey at TQ 61501 74329, adjacent to Ebbsfleet Station, in 2007.

1.2 Survey Limitations

1.2.1 Site access proved to be the greatest limitation. The sites fished represented most of the open water sites where electrofishing and fyke netting proved practicable. A further site existed upstream adjacent to the CTRL railway bridge, but access for fishing gear was poor. Access to the upper river above the CTRL railway bridge was extremely poor.

1.3 Key Findings

1.3.1 Three-spined stickleback were common or abundant at all sites fished and were observed at a number not fished. Nine-spined sticklebacks were also found in both electrofishing and fyke netting operations. Modest populations of mature roach and perch were captured in these same operations. There was no evidence of active recruitment to either of these populations. The only area of mature riverine habitat capable of supporting more than minor species was that encountered at the sites adjacent to the A226/A2260 road junction, where the roach and perch were captured. Much of the channel is overwide and overgrown. Significant areas of open water are rare. The watercourse has been heavily modified, particularly in the upper reaches. The fish community encountered at the road junction sites suggest that river channel restoration projects could lead to significant improvement in the fish holding capacity of other reaches of the watercourse.

2.0 INTRODUCTION

2.0.1 To inform the Environmental Impact Assessment, Colclough & Coates – SC[2] have been engaged to provide a fish survey of the fish communities which might may be associated with the Ebbsfleet Stream. Salient features of the survey can be seen in Figure 1.

Figure 1 Ebbsfleet Stream Fish Survey September 11/12th 2015
Salient Features

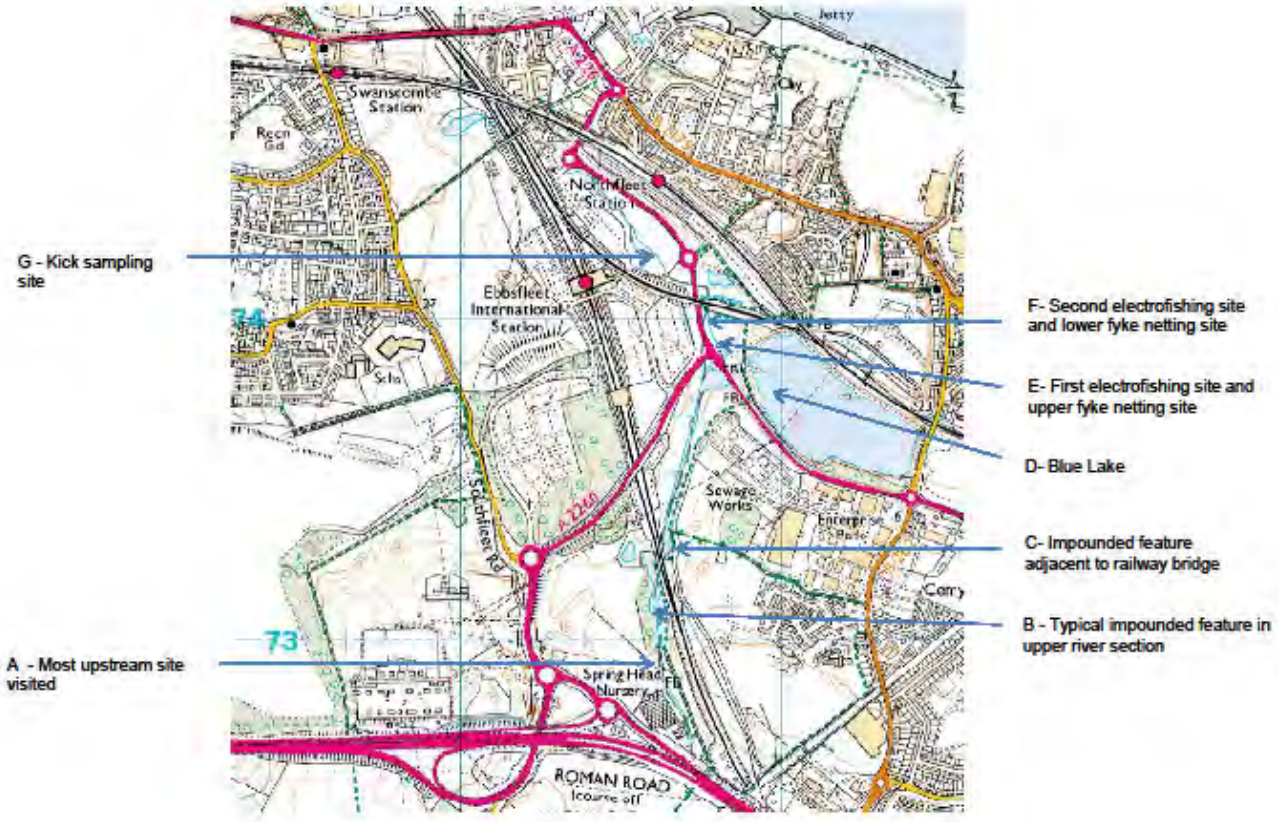

Image drawn from a map provided by Chris Blandford Associates

2.1 Ebbsfleet Stream

2.1.1 The Ebbsfleet Stream (or River) is a small calcareous watercourse running some 4km from its source at 8 original spring sources at Springhead north to discharge to the Thames at Northfleet Harbour.

2.1.2 The water course forms part of a rich local archaeological history. There were Roman settlements and an anchorage at Northfleet and Saxon water mills further upstream. In the 19th century, William Bradbery began the first commercial watercress company in the UK at Springhead in 1808 (Bellenden, 1822). By 1901, most of the water had been abstracted by the local water company. Marie Stopes (1903) conducted a botanical survey of the dried up areas or river bed. A large

proportion of the Ebbsfleet Valley has been damaged land arising from extensive chalk quarrying and subsequent land- fill. The Blue Lake is one local example of that history. (Ebbsfleet D & EF, 1996).

2.1.3 Construction of new tidal defences by the former Greater London Council modified the original discharge to the Thames by routing via a tidal flap valve and a closed culvert section. The Northfleet Harbour Restoration Trust has aims to restore the original form so as to permit the passage of migratory fish. The most recent impact on the watercourse was associated with the construction of the CTRL rail link in 2002.

2.1.4 The stream runs through areas of reed bed, marsh, rough grassland and scrub. With the Blue Lake, the stream supports an important range of complementary habitats forming a mosaic which is of county importance. This is recognised in its designation as a Site of Nature Conservation Interest (SNCI) within the Local Plans for the area. (Ebbsfleet D & EF, 1996).

Plate 2 Ebbsfleet Stream adjacent to A226/A2260 junction

3.0 FISH SURVEY METHODOLOGY

3.1 Walk over survey

3.1.1 Virtually the entire watercourse from Springhead Nurseries downstream to the crossing point of the North Kent rail line at Northfleet was subject to visual surveys during July and August, 2015. Photographs and details of the watercourse from the six key locations (A-C, E-F in Figure 1 above) appear in Appendix 3.

3.1.2 From the walkover survey it was evident that conventional fish survey equipment could only be applied at a very few locations. In a discussion with the Environment Agency it was agreed that the very small and overgrown nature of the watercourse to the south of the CTRL rail bridge precluded the application of any fish survey equipment here (J. Lyons, pers.comm). See photographs at Site A in Appendix 3.

3.2 Electrofishing and fyke netting

3.2.1 Electrofishing was applied on September 11th at sites E & F on Figure 1 (see also Appendix 3). Fishing was conducted with 230v regulated 2.75kva pulsed DC electrofishing equipment provided by Fisheries Solutions. The equipment was boat based with a single anode at Site E and set out on the bank with a 50m wander lead for site F. A 3 man team was supplied by SC^2 in conjunction with Fisheries Solutions. One staff member acted as banksman adjacent to the electrofishing control box, while the wander lead was in use at Site F.

3.2.2 The original intention had been to attempt semi-quantitative surveys between stop nets at Site E. A single 15m by 2m by 5mm stop net was deployed at the upstream point of Site E adjacent to the A226 Thames Way road bridge base, but instream weed and debris, shrub and tree growth rendered the setting of a second stop net at the lower end of the site impracticable.

3.2.3 Two small winged fykes net (5m by 0.5m, 3mm micromesh knotless mesh throughout, otter guards fitted) were set out overnight on September 11/12th, 2015. One fyke was set out at the upstream boundary of Site E and the second one in the centre of Site F.

3.3 Kick sampling

3.3.1 A standard biologists kick net (250mm wide frame, 300mm deep mesh bag with 1mm mesh throughout) was applied at Site G, in very overgrown conditions, in an attempt to capture small fish noted locally. This site is immediately adjacent to the Environment Agency site fished in July 2007

3.3.2 Captured fish were held in oxygenated tanks during the survey operations. All fish were identified, measured to the nearest millimetre and returned to the water.

4.0 RESULTS

4.0.1 Details of the fish captured and observations on those captures appear in Appendix 1. Photographs of exemplar fish appear in Appendix 2.

4.0.2 Three-spined stickleback *Gasterosteus aculeatus* ware found to be abundant at sites E & F with the electrofishing gear, at site F in the fyke net and were also captured in low numbers in the kick net at site G. Nine-spined stickleback *Pungitius*

pungitius were captured in low numbers at site E with both electrofishing gear and fyke net.

4.0.3 8 adult perch *Perca fluviatilis* at 235-320mm were taken by electrofishing at site E, along with 5 adult roach, *Rutilus rutilus* at 160-285mm. 4 adult perch at 240-275mm were taken with the same method at site F, together with 2 adult roach at 215-307mm.

4.0.4 2 adult perch at 263-268mm were recovered from the fyke net at site F.

4.0.5 The only ever Environment Agency fish survey in the Ebbsfleet Stream took place at TQ 61501 74329 on 7th July, 2007. This location is approximately 200m downstream of site G in this survey. A three catch electrofishing operation over a 100m section isolated with stop nets reported no fish captured. The survey reported a 4.5m wide channel with only 15cm depth of water and a heavy fine silt burden.

5.0 EVALUATION OF THE RESOURCE

5.0.1 The overall fish holding capacity of a small watercourse may be severely constrained if there is an inadequate supply of suitable habitat features available, such as depth and cover (N.R.A., 1991). Drawing from experiences in smaller water courses from elsewhere in the South East of England, it is quite possible that populations of larger fish, such as those of roach and perch taken at sites E & F, adjacent to the A226/A2260 road junction, are highly restricted in the Ebbsfleet Stream, given the poor habitat available in much of the watercourse (NRA, 1991 & 1993). The only other area of suitable habitat would appear to be in the overwide deep section around the CTRL Bridge (site C on Figure 1 and in Appendix 3).

5.0.2 Experiences from other small calcareous streams in the South East would suggest that local fish communities may feature cyprinids such as roach and perch, dace *Leuciscus leuciscus* and chub *Leuciscus cephalus*, together with bullhead *Cottus gobio* , brown trout *Salmo trutta* and eel *Anguilla anguilla*. (NRA, 1989).

5.0.3 Informal discussions with anglers from Thameside Works Angling and Preservation Society (TWAPS, who fish Blue Lake), brought several issue to light. Several anglers fished the Ebbsfleet stream in the 1980's. Roach, perch and dace were reported to be present in the lower reaches up to Blue Lake at that time.

5.0.4 No eels were taken during the current survey. Although often difficult to capture efficiently with electrofishing gear, they would probably have been taken in the fyke nets set overnight, if present. Anglers fishing the Blue Lake report regular captures of large eels, with no recruitment evident. Given the close association of the Blue Lake with the watercourse adjacent, it is entirely possible that the installation of a tidal flap valve at Northfleet Harbour as part of the former GLC tidal flood defence scheme in the 1970's brought to an end eel migration into the system.

5.0.5 There is a small balancing pond to the west of the CTRL bridge that discharges to stream immediately upstream of the rail bridge (Site C in Appendix 3) This had been previously managed as a carp fishery. Anecdotal information from TWAPS members suggests that escapee carp either were or may still be present in the deep pool around the bridge.

5.0.6 The condition of the roach and perch taken on both days at sites E & F were excellent, with no visible external lesions or parasites, fin ray or scale damage. There was no recruitment evident in either of these two populations. The smallest roach taken was 160mm and the smallest perch was 235mm. It would appear therefore that this is a not a resident self- recruiting fish community. These fish could either be wash-outs for connected on- line lakes or may have been introduced by anglers (NRA, 1991 & 1993).

5.0.7 Although they are not recruiting, the excellent condition of the fish does suggest that the availability of suitable habitat is constraining fish production, rather than water quality. This it suggests that any future river restoration initiatives on the Ebbsfleet Stream would probably see significant improvements in local fish communities.

6.0 CONCLUSIONS

6.0.1 The past history of the Ebbsfleet Stream has produced a highly modified low flow system with poor availability of suitable habitat for the fish species expected in small calcareous watercourses. Migratory passage probably ended with the 1970's tidal defence works at Northfleet Harbour. Future restoration processes could lead to significant improvements in riverine fish communities and restoration of the migration of species such as eel.

7.0 REFERENCES

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Stopes, M. C. (1903), *The Colonisation of a dried river-bed.* New Phytologist, 2: 186–192. doi:10.1111/j.1469-8137.1903.tb04974.x

8.1 Appendix 1 Species captured in current survey Electrofishing 11th September, 2015

Site	Common Name	Latin Name	Fork Length
Upper site (E)			
	Three- spined stickleback	*Gasterosteus aculeatus*	
	Abundant		25-35mm
	Nine-spined stickleback	*Pungitius pungitius*	28mm
			30mm
			33mm
			N=3
	Perch	*Perca fluviatilis*	235mm
			320mm
			265mm
			295mm
			260mm
			240mm
			280mm
			265mm
			N=8
	Roach	*Rutilus rutilus*	285mm
			264mm
			285mm
			160mm
			275mm
			N=5
Lower site (F)			
	Three- spined stickleback	*Gasterosteus aculeatus*	
	Abundant		20-35mm
	Perch	*Perca fluviatilis*	270mm
			240mm
			275mm
			264mm
			N=4
	Roach	*Rutilus rutilus*	307mm
			215mm
			N=2

8.1 Appendix 1 Species captured in current survey Fyke netting 12th September, 2015

Site	Common Name	Latin Name	Fork Length
Upper site (A)			
	Nine-spined stickleback	*Pungitius pungitius*	
	10 in total		28-34mm
Lower site (B)			
	Three-spined stickleback	*Gasterosteus aculeatus*	
	11 in total		24-32mm
	Perch	Perca fluviatilis	263mm
			268mm
			N=2

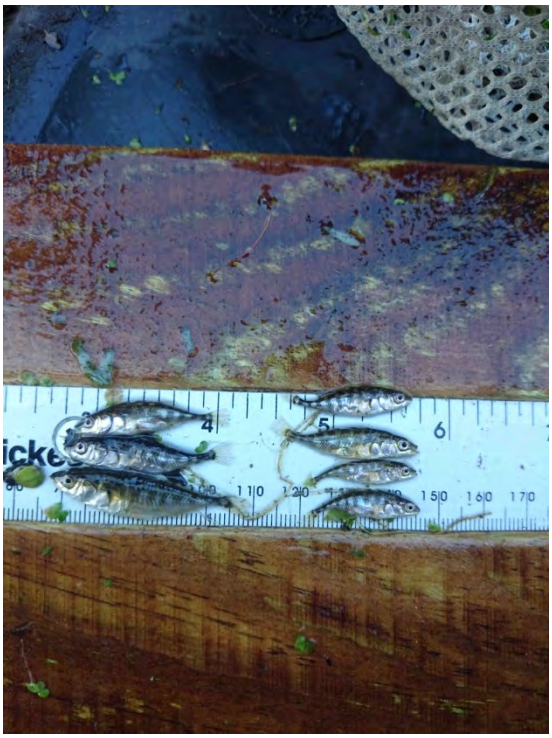
Observation notes:

All of the roach and perch captured were adult fish in excellent condition with no evidence of external lesions or parasites, scale or fin ray damage.

8.2 Appendix 2 Photographs of fish captured

Perch *Perca fluviatilis*

Roach *Rutilus rutilus*



Three-spined stickleback *Gasterosteus aculeastus*

Nine-spined stickleback *Pungitius pungitius*

8.3 Appendix 3 Site photographs and notes

Site A – Downstream of Springhead Nurseries

Looking upstream with nurseries on the right

Looking downstream

Notes: Heavily modified V shaped channel. Wetted area 1-2m. Maximum depth 15cm. No permanently open water. Main instream plant growth *Apium nodiflorum*. Substrate is gravel and fine muds.

8.3 Appendix 3 Site photographs and notes

Site B Typical Impoundments above CTRL rail bridge

Notes: Heavily shaded and overgrown in places. Very silted, and shallow (less than 30cm of water). Predominantly *Phragmites, Carex, Iris,* willow and alder. Stands of *Callitriche i*n open water**.**

8.3 Appendix 3 Site photographs and notes

Site C- Deep section adjacent to CTRL rail bridge

Looking upstream towards discharge from balancing pond

Notes: Open water with reeded margins. At least 1.5m deep in areas. Predominantly *Phragmites, Carex* and *Iris.* Stands of *Callitriche* in some open water areas. No vehicular access to site.

8.3 Appendix 3 Site photographs and notes

Sites E & F Adjacent to A226/A2260 road junction
Main fish survey sites

a) July

b) September

Notes: 7-14m wide. Maximum depth 1m. Rapidly overgrown in the late summer with *Callitriche, Ranunculus* and *Lemna*. *Apium nodifloum, Carex, Iris* and willow in the margins. Gravel bed overlain with heavy silt burden in areas. Limited invertebrate sampling with a kick net found alderfly larvae, caseless caddis, *Asellus* and bloodworm.

8.3 Appendix 3 Site photographs and notes

Site G – Kick sampling in heavily overgrown shaded conditions

Annex EDP 34
London Resort Swanscombe Marshes Fish Survey (APEM, 2020)

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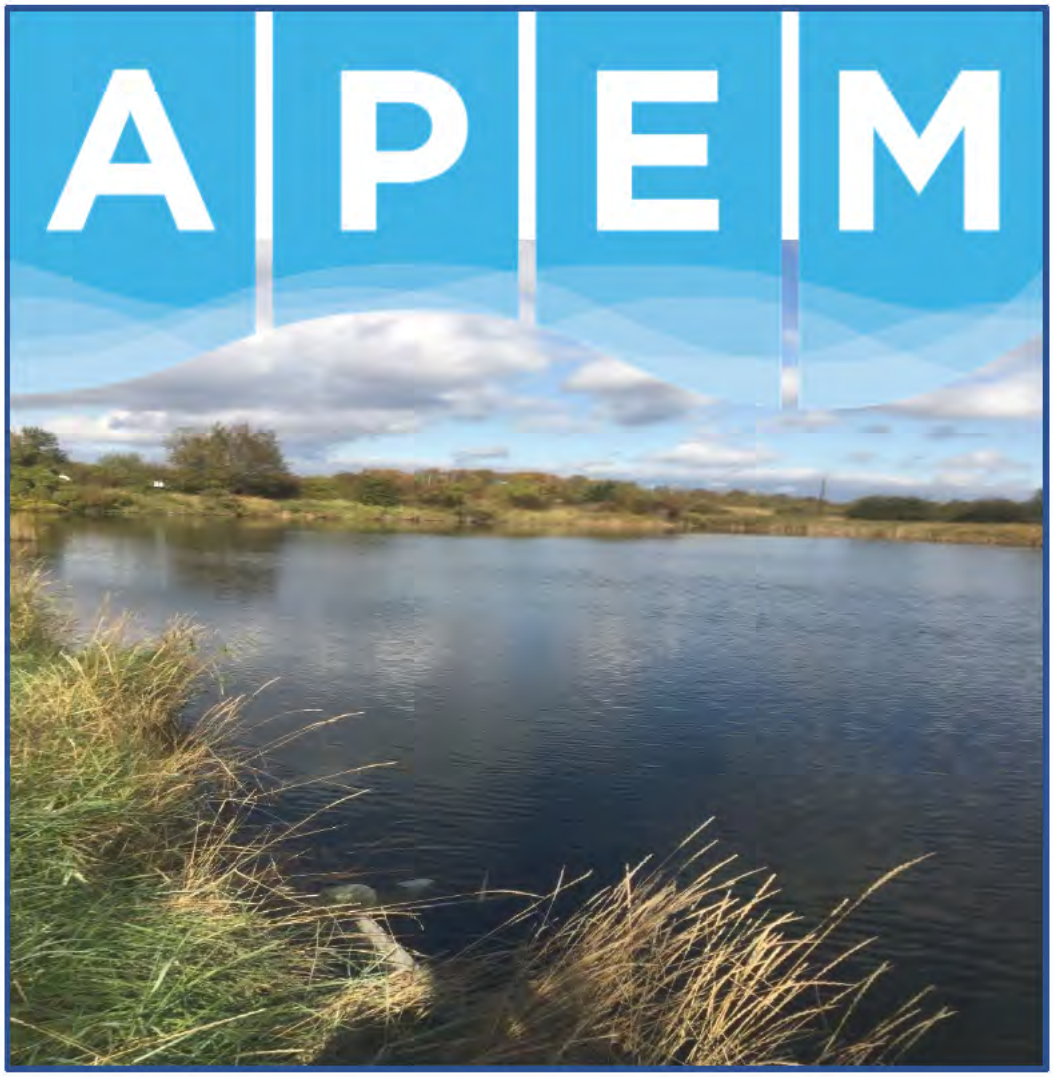

London Resort Swanscombe Marshes

Fish Survey Report

APEM Ref: P00005463

October 2020

Client:	**The Environmental Dimension Partnership**
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Project reference:	**P00005463**
Date of issue:	**October 2020**

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1. Introduction

APEM was commissioned by the Environmental Dimension Partnership Ltd (EDP) on behalf of the London Resort Holding Company to undertake fish surveys on Swanscombe Marsh. The surveys were conducted to provide site characterisation data to inform the aquatic ecology assessment for an Environmental Impact Assessment (EIA) for the London Resort Proposed Development.

This report provides the results of the Swanscombe Marshes fish survey which comprised of fyke netting, electric fishing and hand netting in September 2020.

2. Methodology

2.1 Site selection walkover

An extensive walkover of the site was conducted prior to selecting the sites, to ensure fish surveys were conducted at accessible and representative locations. Figure 1 demonstrates the extent of the ditches and ponds which were inaccessible due to the nature of the marsh and the extensive reed growth. Surveyed reaches are also indicated. Photographs indicating the types of habitat at the site are provided in
Figure 2.

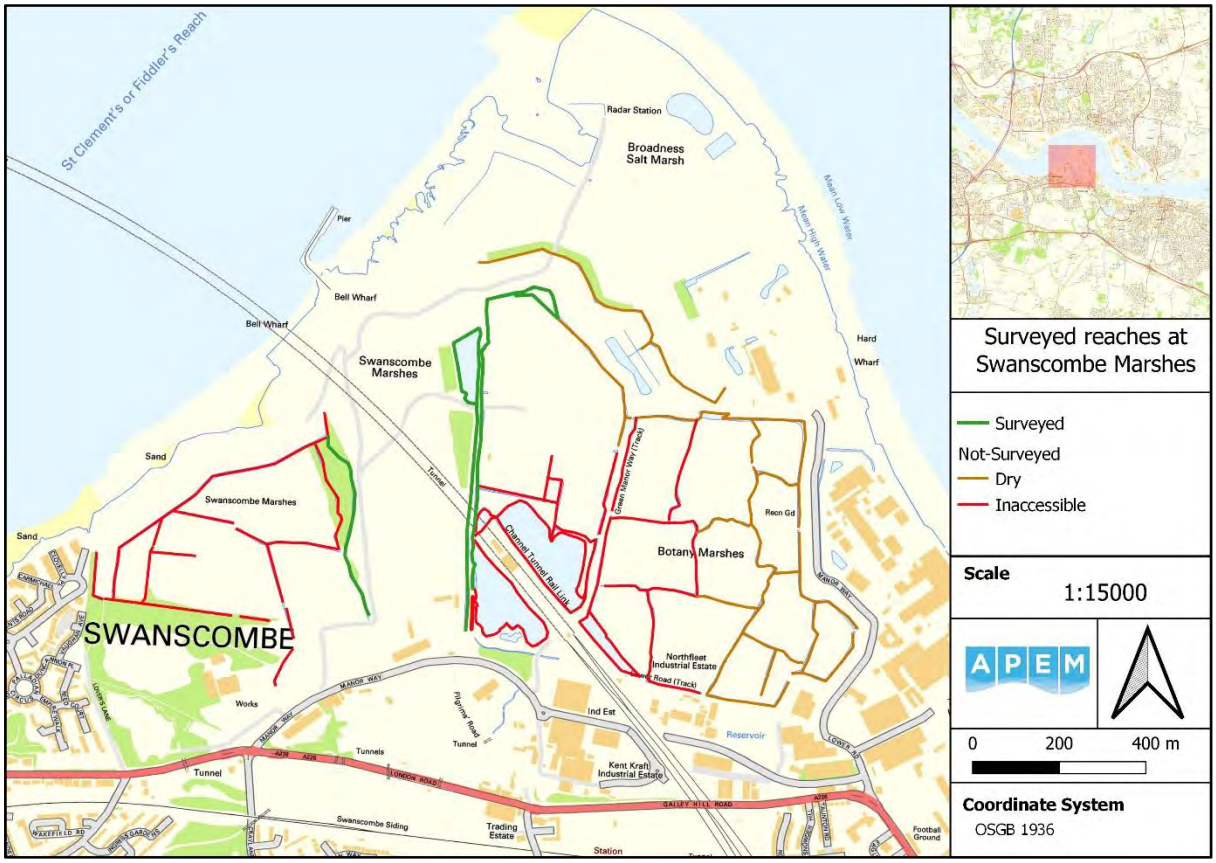


Figure 1 Site selection walkover area

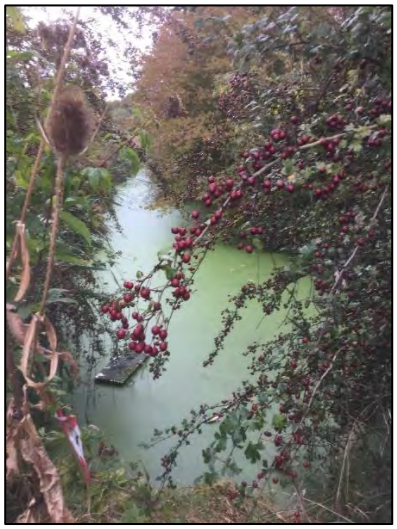
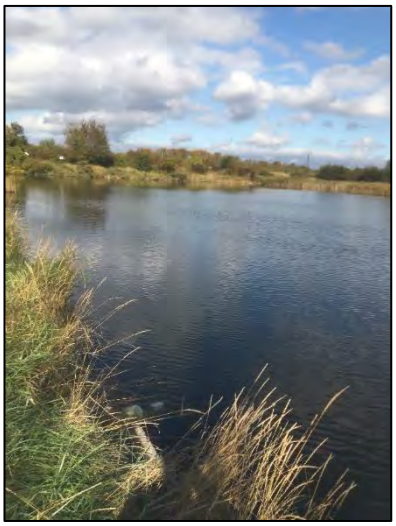
	
D10 A	Drain D12 Unsuitable
	
D10B	P3B

Figure 2 Example of site conditions

2.2 Survey Locations

Electric fishing (EF), fyke netting and hand net sampling surveys were conducted from the 28th to 30th September 2020. Six ditch sites and two pond sites were surveyed within the area of interest. Coordinates for these sites and the survey method used at each site are provided in Table 1. All sites were selected with access, habitat suitability and distribution in mind. The methods employed required areas of open water which could be surveyed efficiently and were were spread out through the drain network on the Proposed Development site (Figure 3).

Table 1 Site Locations

Site	NGR	Method
P3A	TQ60356 75965	Fyke/Sweep
P3B	TQ60326 75884	Fyke/Sweep
D11A	TQ60389 76046	EF/Sweep
D11B	TQ60392 75465	EF/Sweep
D10A	TQ60388 75345	EF/Sweep
D10B	TQ60355 75948	EF/Sweep
D9A	TQ60101 75437	EF/Fyke/Sweep
D9B	TQ60118 75538	EF/Fyke/Sweep

2.3 Licensing

An authorisation to fish using instruments (other than rod and line) under section 27A Salmon and Freshwater Fisheries Act 1975 was provided by the Environment Agency allowing the use of fyke nets and electrofishing equipment.

2.4 Fish survey methods

A combined approach was used to assess the assemblage of fish species present within the ditch network and lake, using fyke netting, electric fishing and sweep sampling techniques. Each method was deployed depending on which was the most suitable on each watercourse, to provide the most efficient and accurate way to survey the drain network and lake.

Electric fishing

APEM surveyors conducted presence/absence electric fishing surveys at accessible locations across the extensive ditch network to establish the fish species present their relative abundances and the life stages present. Fishing was undertaken in an upstream direction (if flow was evident) as per Environment Agency (EA) standards on sampling fish via electric fishing. If fish had been netted they would have been transferred to aerated containers for the catch to be identified, counted, and measured (standard length to the nearest millimetre) before being returned to the watercourse. Eels would have been kept in a separate aerated container to all other fish species as they secrete mucus which can infest the gills of other fish.

Fyke netting

Fyke netting and sweep sampling using a fine mesh net was also undertaken where appropriate. A small (150 mm aperture) double ended fyke net was set and left overnight at Site P3A to allow complete soak time and two small double ended fykes were deployed at Sites D9A and D9B and left in during the daytime to allow maximum time for fish capture. Site P3A was the only suitable site to leave the fyke net overnight as the other sites were very shallow and there was a risk that diving birds could become entangled in the fyke nets.

Sweep netting

Sweep net samples were conducted to target heavily vegetated habitats where electric fishing and fyke netting would be less effective. The net was repeatedly swept through the wetted vegetation.

Figure 3. Overview of the sites surveyed

3. Results

No fish were captured at any of the survey sites or were observed throughout the survey period. Large areas of the marsh were inaccessible due to large reedbeds covering the whole of the channel making areas impractical to survey and some ditches were dry (Lake P8). Site P3 was too conductive for electro fishing to be effective and it is suspected this lake may experience intermittent saline intrusion. The lake bed appeared to be anoxic a very strong odour evident when disturbed and litter was evident in and around the lake. There also was a large blue green algae bloom present at the time of sampling at Site P3. Similarly, all of the substrates of the ditches surveyed appeared to be anoxic based on the odour when disturbed.

4. Summary

Although no fish were caught or observed during the surveys it is possible that fish could be present within the drains and lakes. The survey sites were very overgrown with large amounts of macrophyte in channel or covering the surface limiting the efficacy of some methods (surface macrophyte limits visibility while dense macrophyte limits both visibility and restricts access). However, it is unlikely that fish are present in large numbers and if present it is also likely these water bodies support a restricted range of species.

Surveys conducted on Swanscombe Marshes in the past have found similar results. A survey in 2015 recorded three individuals of three-spined stickleback *Gasterosteus aculeatus* within similar habitats at the site deploying similar methods to the current survey (Colclough and Coates 2015). In addition, a survey conducted by the Environment Agency in 2007 recorded no fish at all (Colclough and Coates 2015).

Consequently, the Swanscombe Marshes does not appear to support a notable fish population in either the drains or the ponds.

5. References

Colclough S (2015). A fish survey of Swanscombe Marshes. Colclough and Coates SC[2].

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