The London Resort Development Consent Order

BC080001

Environmental Statement
Volume 2: Appendices

Appendix 13.6 – Intertidal Fish Ecology Survey

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Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2)(a)
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 12(1)

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Revisions

Revision	Description	Issued by	Date	Approved by
00	Issue for DCO Submission	RA	24/12/2020	APEM/MH

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Executive Summary

APEM Ltd was commissioned by the Environmental Dimension Partnership Ltd (EDP) on behalf of the London Resort Holding Company to undertake a series of marine ecology surveys to inform an Ecological Impact Assessment (EIA) for the London Resort Proposed Development. This report presents intertidal fish survey data from surveys conducted at the Kent Project Site in June and September 2020. Intertidal surveys involved the deployment of fyke nets and seine nets to catch fish which were identified, measured and released.

Intertidal fish surveys took place at the Kent Project Site in the intertidal area surrounding White's Jetty. Survey stations were located on the western shore of the Swanscombe Peninsula within 0.5 km on either side of White's Jetty. For the first survey, four fyke net stations and five seine net stations were sampled and during the second survey, two fyke net and four seine net stations were sampled.

The most frequently caught fish species using fyke nets during the June survey was European flounder *Platichthys flesus* (26 individuals recorded) and during the September survey it was European bass *Dicentrarchus labrax* (36 individuals recorded). Atlantic herring *Clupea harengus* was the most frequently recorded species in the seine nets during the June survey (77 individuals recorded) and European bass was the most frequently recorded in the September survey (22 individuals recorded).

A number of species of conservation importance were recorded. European eel *Anguilla anguilla* is considered globally critically endangered by the IUCN Red List of Threatened Species (Pike *et al*. 2020) and is also protected under the Eels (England and Wales) Regulations 2009. European eel, European smelt *Osmerus eperlanus*, Atlantic herring and European plaice *Platichthys flesus* are all Species of Principal Importance on the Section 41 list under the Natural Environment and Rural Communities (NERC) Act (NERC Act, 2006). The goby species sand goby *Pomatoschistus minutus* and common goby *Pomatoschistus microps* are on Appendix III of the Bern Convention.

Two individuals of the highly invasive non-native species Chinese mitten crab *Eriocheir sinensis* were caught during fyke netting at Station F04.

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Glossary

EIA	Environmental Impact Assessment
TL	Total Length
TRWL	Temporary River Works Licence
IUCN	International Union for Conservation of Nature
NERC	Natural Environment and Rural Communities

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Chapter One ◆ Introduction

Background

1.1. APEM Ltd was commissioned by the Environmental Dimension Partnership Ltd (EDP) on behalf of the London Resort Holding Company to undertake an intertidal fisheries survey for the London Resort Proposed Development. The surveys were conducted to provide site characterisation data to inform the aquatic ecology assessment for an Environmental Impact Assessment (EIA) for the Proposed Development. The overall survey programme has provided site-specific data for intertidal fish, benthos (intertidal and subtidal), saltmarsh and sediment chemistry.

1.2. This report provides the results of the intertidal fish survey which comprised of fyke netting and seine netting in June and September 2020.

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Chapter Two ◆ Methodology

SURVEY AREA

2.1 The survey area was part of the Kent Project Site of the London Resort which covers the intertidal area and saltmarsh on the west section of the Swanscombe Peninsula (Appendix 1, Figure 13.6.1; Appendix 2). Sampling was undertaken at locations in the vicinity of White's Jetty and Bell Wharf.

SURVEY DESIGN

2.2 The intertidal fisheries surveys were conducted on 18th June 2020 and 22nd and 23rd September 2020. A map indicating the locations of the sampling stations in relation to the proposed Project is provided in Appendix 1 (Figure 13.6.1), with station coordinates provided in Appendix 2. The sampling array for the June survey consisted of:

- Four fyke net stations (F01 to F04); and
- Five seine net stations (S01 to S05).

2.3 The sampling array for the September survey was as follows, with the stations in proximity to those sampled in June:

- Four fyke net stations (F05 to F08); and
- Four seine net stations (S06 to S09).

METHODS

Fyke netting

2.4 Fyke nets are a sequence of conical shaped nets fitted within each other which are held open by a series of rigid hoops which progressively reduce in size, before terminating in a cod end. At each station, fyke nets were set in pairs (double fykes) perpendicular to the estuary and left over a full tidal cycle to sample fish and other mobile fauna. Each fyke net consisted of a 1 m high hoop and six progressively smaller hoops and a 5.3 m long trap section with a 5 m long leader manufactured from 10 mm mesh. All fish captured were identified to species level and measured (total length (TL) to nearest mm) prior to release back into the estuary.

Seine netting

2.5 Seine netting was conducted in the vicinity of fyke nets at slack high water using a micromesh seine of 15 m in length and 2.5 m deep and was deployed in an arc to trap any fish present. Two seine net deployments were conducted at adjacent but not overlapping

locations at each sample station to increase the volume of water sampled. During the June survey, seine netting at Station S02 resulted in a low catch, consequently sampling was repeated at a different location (Station S03). Sampling was considered to be effective at all other stations. All fish captured were identified to species level and measured prior to release back into the estuary.

LICENCES AND PERMISSIONS

2.6 A Temporary River Works Licence (TRWL) was acquired from the Port of London Authority and an exemption notice was submitted to the Marine Management Organisation (MMO) to inform them that the survey was exempt from needing a marine licence. 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.

2.7 The survey design for the intertidal fisheries survey was approved by the Environment Agency prior to deployment with exact stations modified in the field as required based on logistic and health and safety considerations.

Chapter Three ◆ Results

FYKE NETTING

3.1 In total six fish species were recorded in the fyke net samples (Table 3-1). The most frequently recorded species across all fyke net survey stations from both the June and September surveys was European seabass *Dicentrarchus labrax* with numbers higher in September (Table 3-1).

Table 3-1: Numbers of individuals of different fish species recorded in fyke net samples during the June and September intertidal fisheries surveys.

Survey		**June**				**September**			
Sample Number		**F01**	**F02**	**F03**	**F04**	**F05**	**F06**	**F07**	**F08**
Taxa ID									
Atlantic herring	*Clupea harengus*	1	1						
European eel	*Anguilla anguilla*	2	5		3	1	4		
European seabass	*Dicentrarchus labrax*	1	1	7	10	19	17		2
European flounder	*Platichthys flesus*	6	12	5	3				
Common dab	*Limanda limanda*					1	1		
European plaice	*Pleuronectes platessa*							1	1

June Survey

3.2 Four fish species were recorded across the four fyke netting stations and a total of 57 individuals, including adults and juveniles (Figure 13.6.2). At Stations F01 and F02, the most frequently recorded species was European flounder *Platichthys flesus* (65–320 mm Total Length (TL)) with six and 12 individuals, respectively. At Stations F03 and F04, the most frequently recorded species was seabass (103-480 mm TL) with seven and 10 individuals, respectively. Other fish species captured in the fyke nets in June were European eel *Anguilla anguilla* (140-610 mm TL) and Atlantic herring *Clupea harengus* (60-295 mm TL). Across all survey stations, European flounder was the most frequently caught species with a total of 26 individuals, followed by European seabass, European eel and Atlantic herring with 19, 10 and two individuals, respectively.

September survey

3.3 Four fish species were recorded across the four fyke net survey stations and a total of 47 individuals, including adults and juveniles (Figure 13.6.3). Across the four stations, European seabass (75–470 mm TL) was the most frequently recorded species with 19 individuals recorded at F05 and 17 individuals recorded at F06 (total of 38 individuals recorded in the September survey). Other species caught in the fyke nets were European eel (360–750 mm TL) and common dab *Limanda limanda* (210–250 mm TL) and European plaice *Pleuronectes platessa* (170-180 mm TL) with five, two and two individuals caught across survey stations, respectively.

SEINE NETTING

3.4 A total of 11 fish taxa were recorded across the seine net samples. The most frequently caught species across seine net survey stations in June was Atlantic herring and in September it was European seabass (Table 3-2).

June Survey

3.5 Eight fish taxa were recorded across the five seine net stations. A total of 102 individuals were recorded, including adult and juvenile specimens (Figure 13.6.4). At Station S01, the most frequently recorded species were Atlantic herring (49-81 mm TL) and goby spp. (16-33 mm TL) with five individuals recorded for each. At Station S02, the only species recorded was goby spp. with one individual caught. The most frequently recorded species at Stations S03, S04 and S05 was Atlantic herring with 12, nine and 51 individuals, respectively. Other fish species captured in seine nets included three-spined stickleback *Gasterosteus aculeatus* (19–36 mm TL), European perch *Perca fluviatilis* (44 mm TL), European smelt *Osmerus eperlanus* (44-46 mm TL), European sprat *Sprattus sprattus* (41-51 mm TL), and *D. labrax* (103-480 mm TL) and *P. flesus* (34-35 mm TL). Across all survey stations Atlantic herring was the most frequently caught species with a total of 77 individuals.

September survey

3.6 Six fish taxa were recorded across the four seine net stations and a total of 41 individuals were recorded including adults and juveniles (Figure 13.6.5). At Stations S06 and S07 the most frequently recorded species was European seabass (20-95 mm TL), with 13 and nine individuals caught, respectively. At station S08 the most frequently caught species was juvenile mullet Mugilidae (considered likely to be thin-lipped mullet) (15-25 mm TL), with nine individuals recorded. At Station S09 only two individuals each for sand smelt (50-55 mm TL) and juvenile mullet (15-25 mm TL) were recorded. Across all survey stations, European seabass was the most frequently caught species with a total of 22 individuals

Table 3-2: Abundance of different fish taxa recorded within seine net samples.

Survey		June										September							
Sample number		S01		S02		S03		S04		S05		S06		S07		S08		S09	
Replicate		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Taxa ID																			
Atlantic herring	*Clupea harengus*	1	4	-	-	11	1	1	8	5	46	-	-	-	-	-	-	-	-
European seabass	*Dicentrarchus labrax*	-	1	-	-	-	-	-	-	-	-	8	5	6	3	-	-	-	-
Goby spp.	*Pomatoschistus* spp.	4	1	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Three Spined stickleback	*Gasterosteus aculeatus*	-	-	-	-	-	-	1	1	1	1	-	-	-	-	1	-	-	-
European smelt	*Osmerus eperlanus*	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-
European perch	*Perca fluviatilis*	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
European flounder	*Platichthys flesus*	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
European sprat	*Sprattus sprattus*	-	-	-	-	-	-	5	3	1	-	-	-	-	-	-	-	-	-
Thin lipped grey mullet	*Chelon labrosus*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Sand smelt	*Atherina presbyter*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1
Mullet (juv.)	Mugilidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	7	1	1

NOTABLE TAXA

3.7 A number of species of conservation interest were recorded. European eel is considered globally critically endangered by the IUCN Red List of Threatened Species (Pike et al. 2020) and is also protected under the Eels (England and Wales) Regulations 2009. European eel, European smelt, Atlantic herring and European plaice are all Species of Principal Importance on the Section 41 list under the Natural Environment and Rural Communities (NERC) Act (NERC Act, 2006). Sand goby and common goby are on Appendix III of the Bern Convention.

3.8 One non-native species was recorded, the Chinese mitten crab *Eriocheir sinensis*. Two individuals were captured during fyke netting at Station F04.

Chapter Four ◆ Summary

SUMMARY

4.1 Intertidal fish surveys were conducted at the London Resort Kent Project Site in June and September 2020 using fyke and seine nets. In the June survey four fyke net stations and five seine net stations were sampled and in the September survey, two fyke net and four seine net stations were sampled.

4.2 A total of 14 taxa were identified across both fyke and seine netting surveys. In the June survey a total of four taxa were recorded in fyke net samples and eight taxa in seine net samples while in the September survey four taxa were recorded in fyke nets and six were in the seine net samples. The most abundant and frequently observed taxon across the June survey was Atlantic herring and the most abundant and frequently observed taxon across the September survey was European seabass.

4.3 A number of species of conservation importance were recorded during the survey. Chinese mitten crab was the only non-native species recorded during the surveys with two individuals captured during fyke netting at station F04.

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References

Natural Environment and Rural Communities (NERC) Act. 2006. Section 41.

Pike C., Crook V. & Gollock M. 2020. *Anguilla anguilla*. The IUCN Red List of Threatened Species 2020: https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T60344A152845178.en. Accessed on 05 October 2020.

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Appendices

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Appendix 1.0 Figures

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Figure 13.6.1: Intertidal fish survey stations at the Kent Project Site.

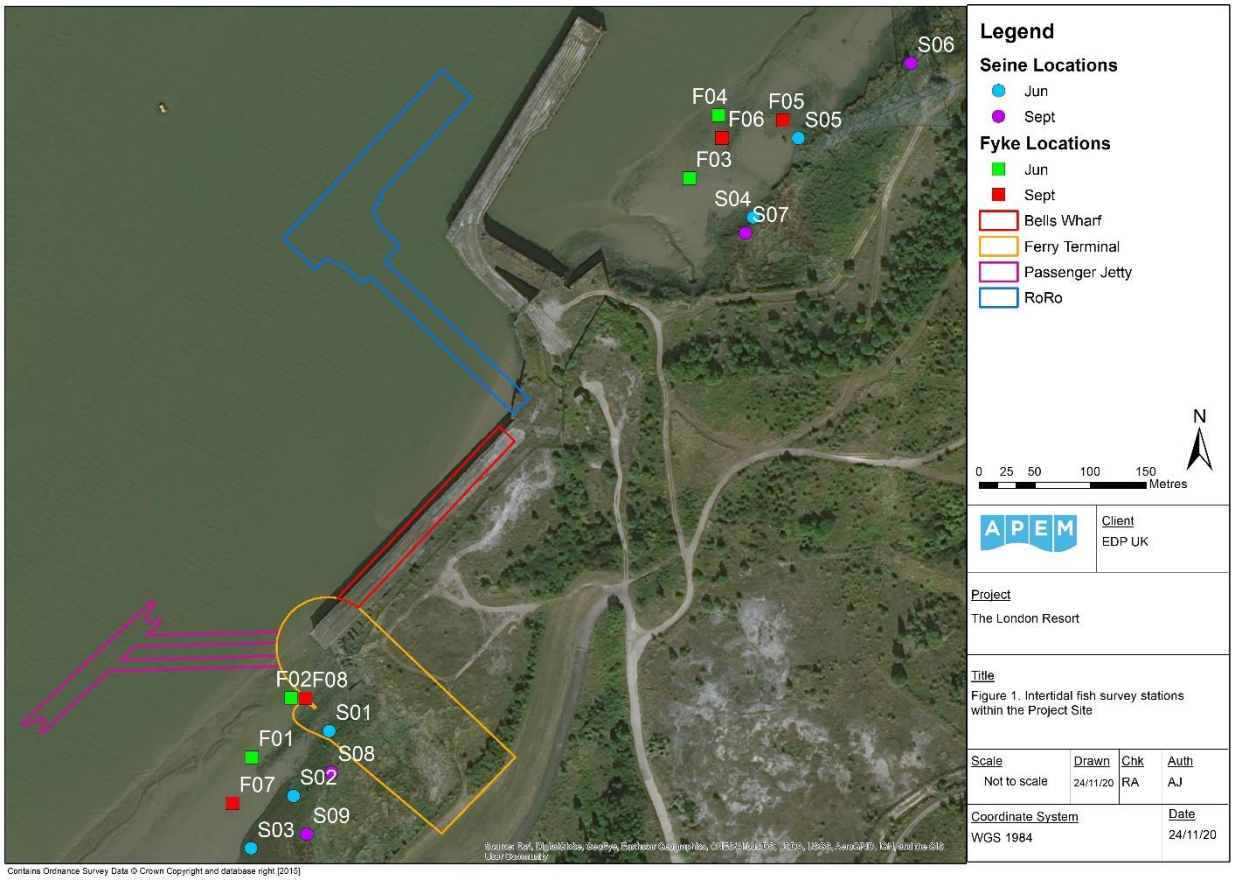


Figure 13.6.2: Number of taxa caught at fyke net stations (F01 – F04) during the June survey.

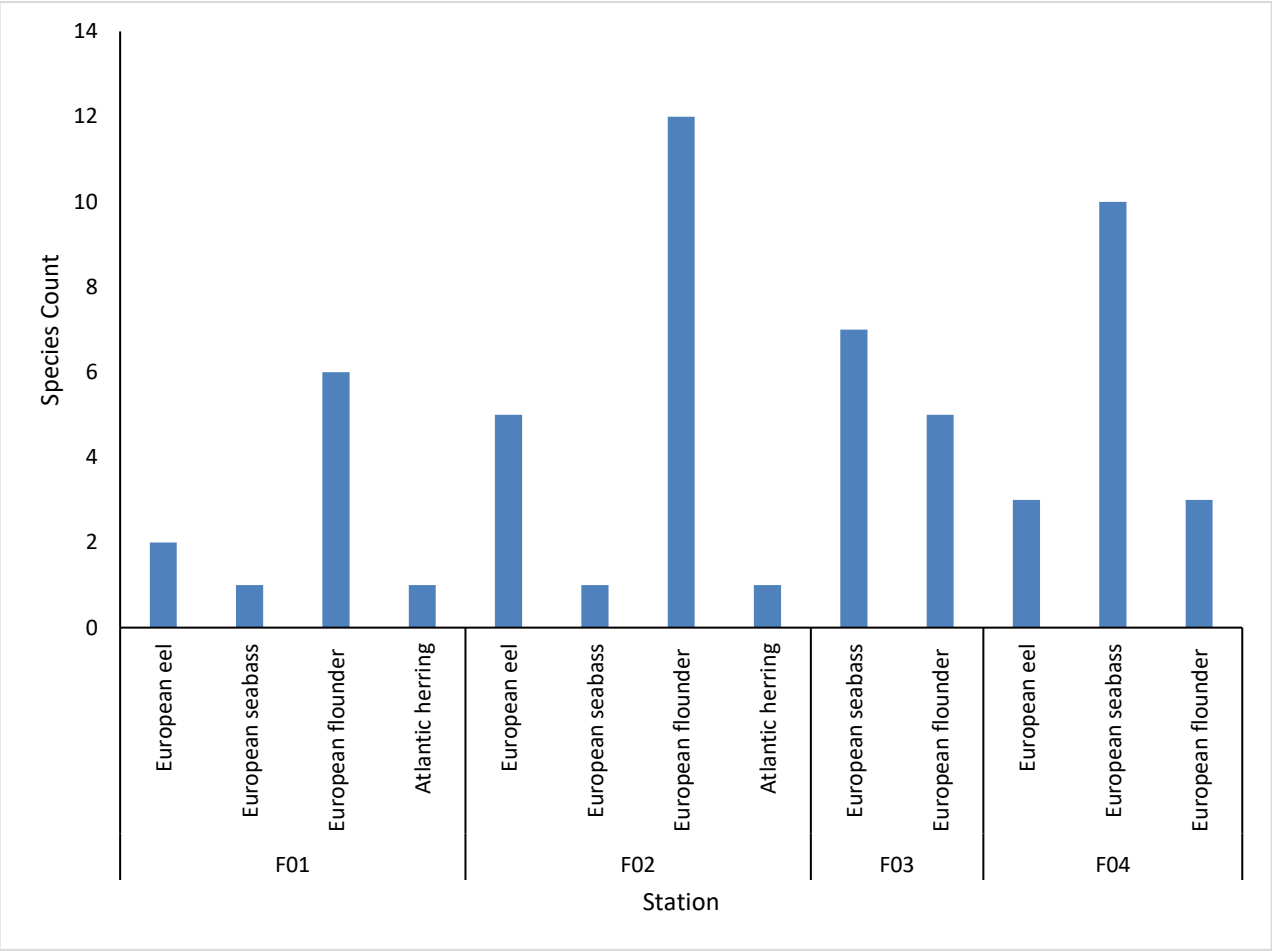


Figure 13.6.3: Number of taxa caught at fyke net stations (F05 – F08) during the September survey.

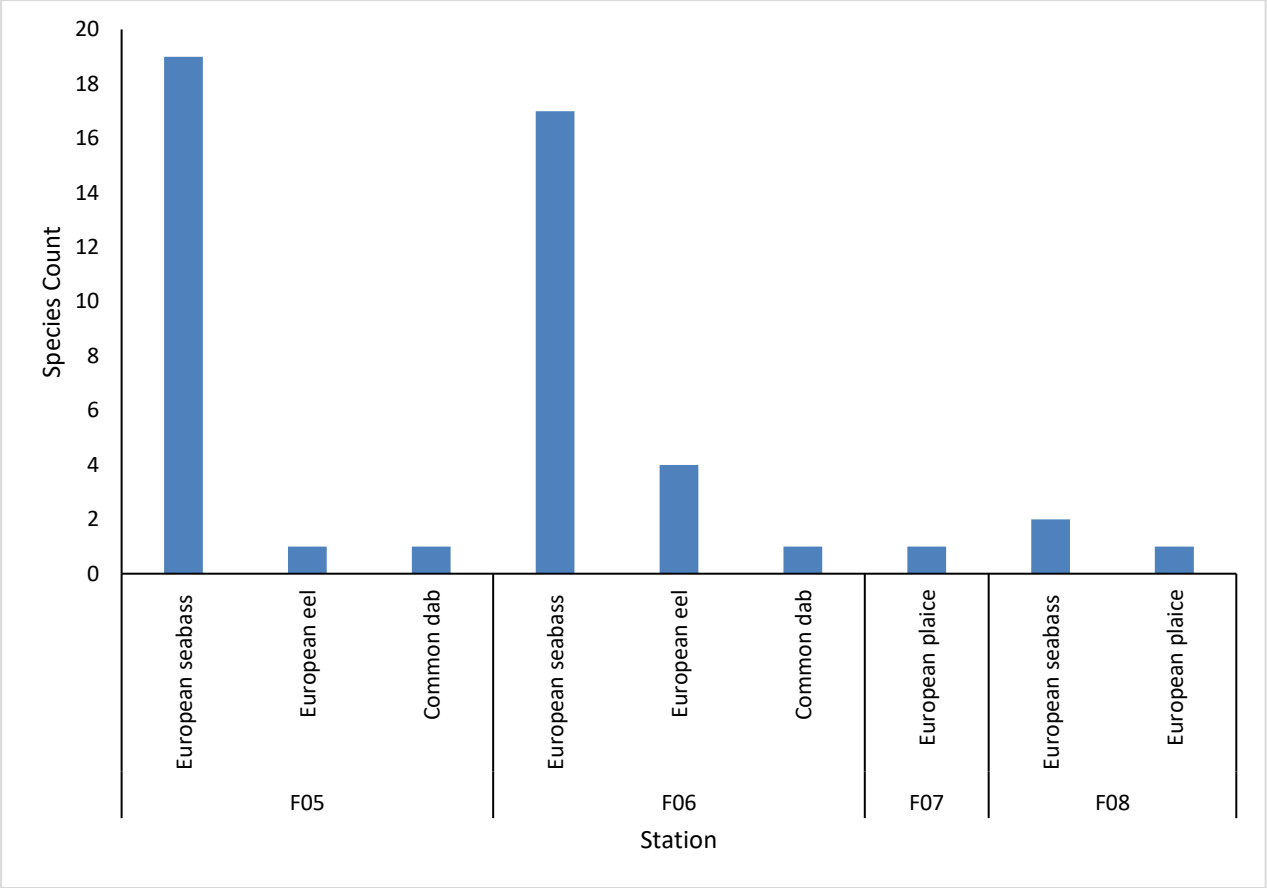


Figure 13.6.4: Number of taxa caught at seine net stations (S01 – S05) during the June survey.

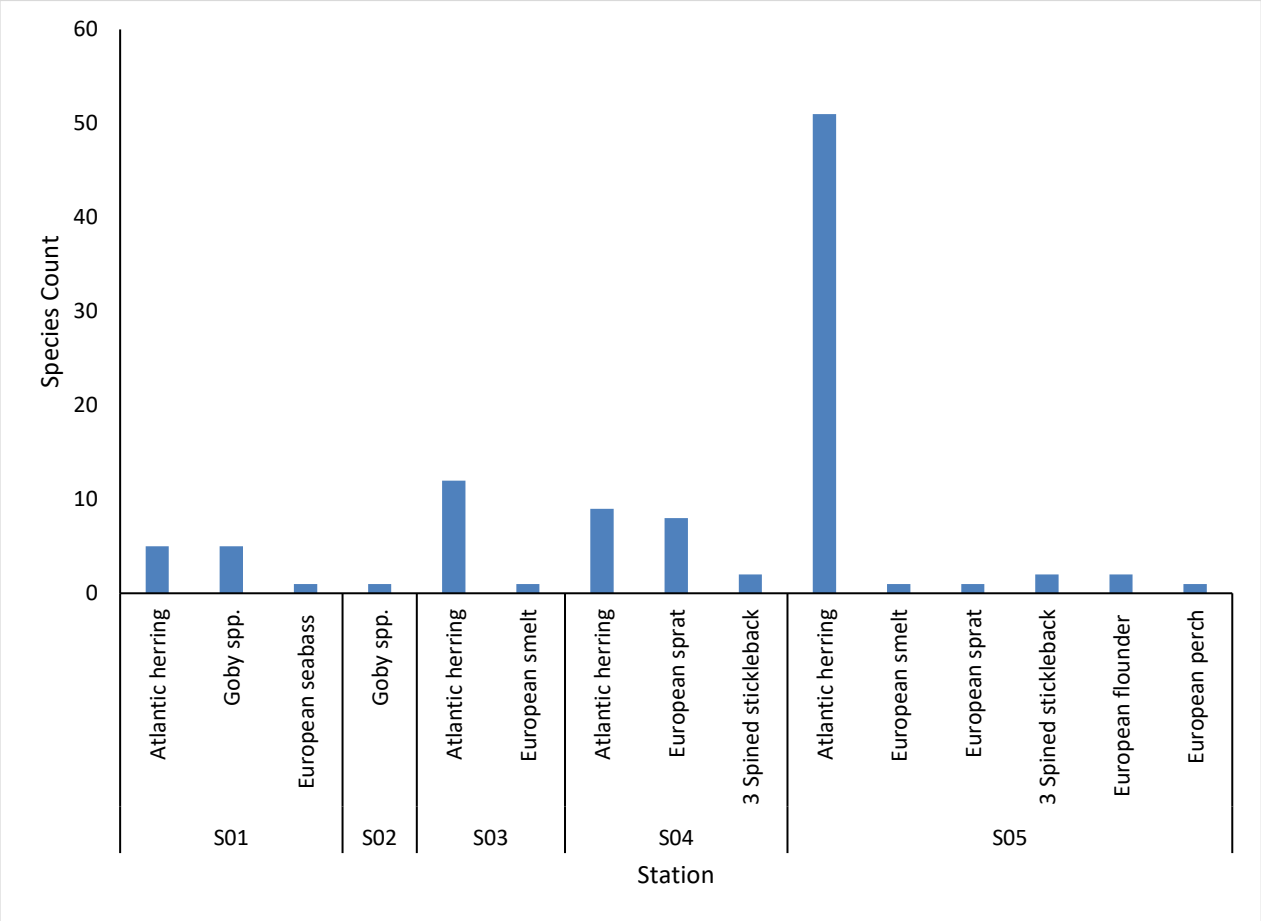
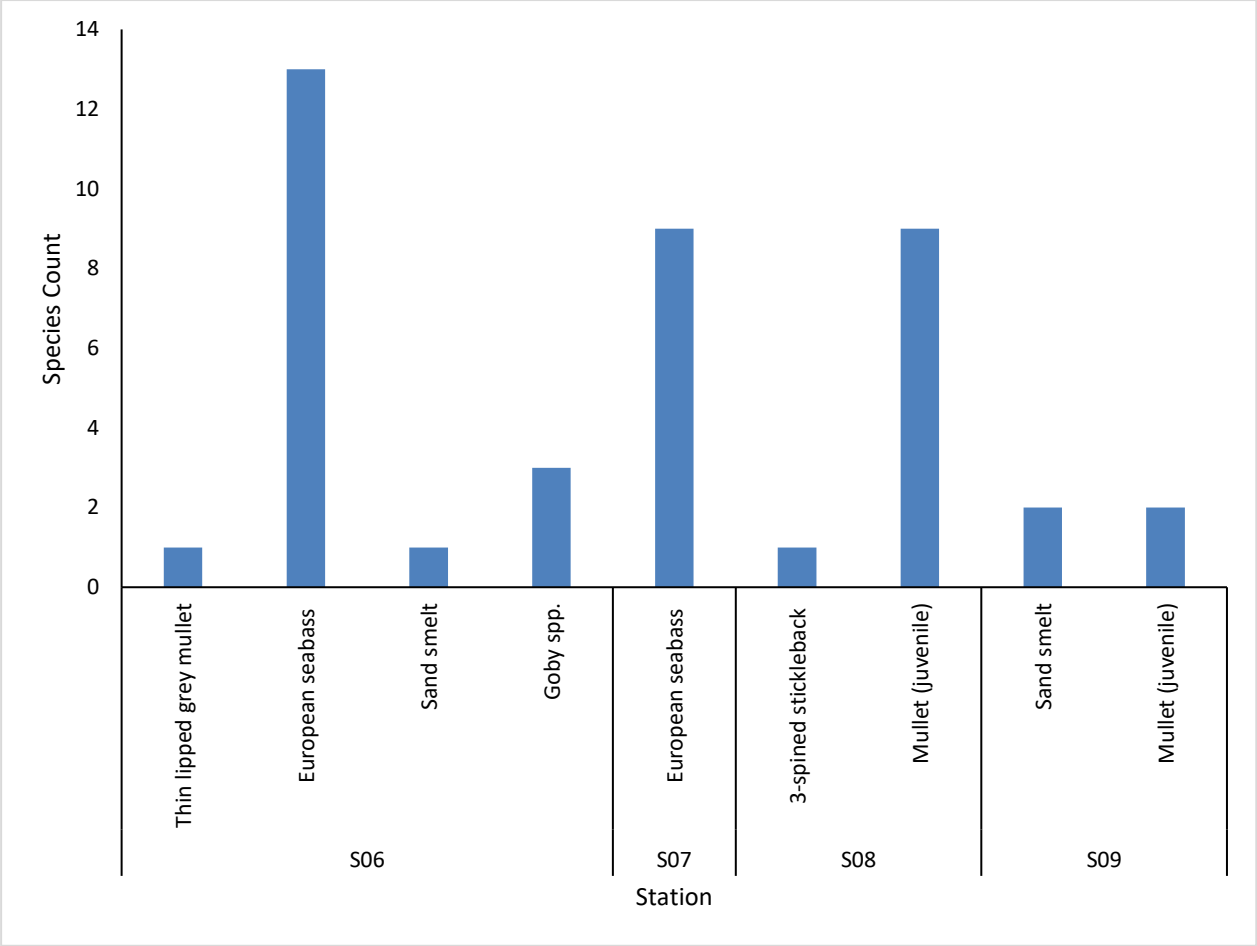


Figure 13.6.5: Number of taxa caught at seine net stations (S06 – S09) during the September survey.



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Appendix 2.0 Station Coordinates

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Station	Sample Date	WGS84		British National Grid	
		Latitude	Longitude	Easting	Northing
Fyke Netting					
June Survey					
F01	18/06/2020	51.45881	0.29985717	559875	175823
F02	18/06/2020	51.45911	0.30017455	559896	175857
F03	18/06/2020	51.461725	0.303394	560110	176155
F04	18/06/2020	51.462042	0.303633	560126	176191
September Survey					
F05	22/09/2020	51. 462017	0.304150	560162	176189
F06	22/09/2020	51.461928	0.303656	560128	176178
F07	22/09/2020	51.458579	0.299702	559865	175797
F08	22/09/2020	51.459107	0.300290	559904	175857
Seine Netting					
June Survey					
S01	18/06/2020	51.458942	0.30048281	559918	175839
S02	18/06/2020	51.458615	0.30019284	559899	175802
S03	18/06/2020	51.458352	0.29984852	559876	175772
S04	18/06/2020	51.461527	0.30390969	560147	176134
S05	18/06/2020	51.461925	0.30427523	560171	176179
September Survey					
S06	22/09/2020	51.462303	0.305187	560233	176223
S07	22/09/2020	51.461448	0.303848	560143	176125
S08	22/09/2020	51.458734	0.300501	559920	175816
S09	22/09/2020	51.458415	0.300298	559907	175780

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