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Volume 3, Appendix 21.2: UK Habitat Classification Survey

Outer Dowsing Offshore Wind Environmental Statement

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V1.0	1 March 2024	SLR	GoBe	ODOW

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Table of Contents

Basis of	Report	i
Acronyn	ns and Terminology	v
21.0 UK	Habitat Classification Survey	1
21.1 Intr	oduction	1
21.1.1	The Project	1
21.1.2	Survey Area	3
21.2 Leg	gislation	115
21.3 Me	thodology	116
21.3.1	Desk Study	116
21.3.2	Field Survey	116
21.3.3	Hedgerow Assessment	117
21.4 Lim	nitations	118
21.5 Det	termining Important Ecological Features	120
21.6 Res	sults	121
21.6.1	Desk Study	121
21.6.2	Field Survey	121
21.6.3	Plant Species	149
21.6.4	Important Ecological Features	151
21.7 Co	nclusion	154
Reference	ces	155
Annex A	: Biodiversity Action Plan Definitions	157
Table	of Figures	
Figure 2	1.1.1: UK Habitat Survey Results	4
Figure 2	1.2.2: Important Habitats	59
Table	s in Text	
	.1: Onshore Order Limits Segment Names	2
	.2: Legislation and Policy Context	
	.3: MAGIC Records of Priority Habitats within the Order Limits and/	
. 4510 21	With Growing of Friends and Friends and	
Table 21	.4: Main Woodlands within the Order Limits and 100m Buffer	132
Table 21	5: Notable Plant Species	150



Plates in Text

Plate 21.1: ECC 10 – A field of cereal crop, to the east of Haven River and Scalp Road, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)
Plate 21.2: ECC 10 – Arable field margin between two fields, to the east of Grovefield Lane, Freiston, Boston, Lincolnshire (Photograph taken June 2023)
Plate 21.3: ECC 5 – Modified grassland, to the east of Church Lane, Croft, Skegness, Lincolnshire (Photograph taken June 2023)126
Plate 21.4: ECC 12 – Sheep Grazed modified grassland, south of Marsh Road, Kirton, Boston, Lincolnshire (Photograph taken March 2023)
Plate 21.5: ECC 1 – Coastal Floodplain Grazing Marsh (g4) to the east of Roman Bank Road, Skegness, Lincolnshire (Photograph taken July 2023)
Plate 21.6: ECC 5 – Neutral grassland, south of the Wainfleet Relief Channel and Weir Dike, Skegness, Lincolnshire (Photograph taken August 2023)
Plate 21.7: ECC 2 – Coastal Floodplain Grazing Marsh (g3) to the west of Sloothby High Lane, Manor Farm, Hogsthorpe, East Lindsey, Lincolnshire (Photograph taken January 2023)
Plate 21.8: ECC 12 – Green Lane between linear scrub, southeast of Thompson's Lane, Fosdyke, Boston, Lincolnshire (Photograph taken September 2023)
Plate 21.9: ECC 5 – Line of young trees, east of Church Lane, Skegness, Lincolnshire (Photograph taken September 2023)
Plate 21.10: ECC 5 – Line of non-native ornamental trees within the garden of a private residence, east of Croft Lane, Skegness, Lincolnshire (Photograph taken June 2023)
Plate 21.11: ECC 7 – "Important Hedgerow" 1926, east of Small End Road, Friskney, Boston, Lincolnshire (Photograph taken March 2023)137
Plate 21.12: ECC 13 – Scrub east of Smeeton's Lane, Boston, Lincolnshire (Photograph taken May 2023)138
Plate 21.13: ECC 1 – view of dense sea buckthorn and occasional mixed scrub, near Roundhouse, Roman Bank, Anderby Creek, East Lindsey, looking southeast, Lincolnshire (Photograph taken September 2023)
Plate 21.14: ECC 1 – Natural woodland pond (Pond 19) north of Lowgate Road, Skegness, Lincolnshire (Photograph taken January 2023)140
Plate 21.15: ECC 3 – Man-made fishing pond (Pond 39) north of Younger's Lane, Burgh le Marsh, Skegness, Lincolnshire (Photograph taken September 2022)141
Plate 21.16: ECC 1 – Location of temporary water body (Pond 9), east of Roman Bank, Anderby Creek, Lincolnshire (Photograph taken September 2022)141
Plate 21.17: ECC 3 – Typical ditch habitat within the survey area, south of Younger's Lane, Burgh le Marsh, Skegness, Lincolnshire (Photograph taken June 2023) 142
Plate 21.18: ECC 11 – Historical Hobhole drain, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)143
Plate 21.19: ECC 11 and ECC 12 – View across the River Welland, Fosdyke, Boston Lincolnshire (Photograph taken August 2023)144
Plate 21.20: ECC 1 – Reedbed covering Pond 11 to the east of Roman Bank Road, Anderby Creek, Lincolnshire (Photograph taken September 2022)



Plate 21.21: ECC 1 – Reedbed along a ditch to the east of Ember Lane, Langham, Mun Alford, Lincolnshire (Photograph taken January 2023)	•
Plate 21.22: ECC 1 – An area of saltmarsh along the River Haven, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)	146
Plate 21.23: ECC 1 – Coastal mudflats either side of the River Haven, Fishtoft, Boston, Lincolnshire (Photograph taken January 2023)	
Plate 21.24: ECC 1 – Typical view of the beach from near Roman Bank, Anderby Creek East Lindsey, Lincolnshire (Photograph taken May 2022)	
Plate 21.25: ECC 1 – View of scrub, sand dunes and beach from near Roundhouse, Ro Bank, Anderby Creek, East Lindsey, looking southeast, Lincolnshire (Photog taken May 2022)	jraph

Annexes

Annex A Biodiversity Action Plan Definitions



Acronyms and Terminology

Acronyms

Acronyms and Abbreviations	Description
ACIEEM	Associate Member of the Chartered Institute of Ecology and Environmental Management
ASNW	Ancient Semi-Natural Woodland
BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
CEnv	Chartered Environmentalist
CFGM	Coastal and Floodplain Grazing Marsh
CIEEM	Chartered Institute of Ecology and Environmental Management
DCO	Development Consent Order
ECC	Onshore Export Cable Corridor
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographical Information System
GLNP	Greater Lincolnshire Nature Partnership
HAP	Habitat Action Plans
HPI	Habitats of Principal Importance
INNS	Invasive Non-Native Species
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LCGM	Lincolnshire Coastal Grazing Marshes
LEPO	Long-Established Woodlands of Plantation Origin
LNR	Local Nature Reserve
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographical Information for the Countryside
MMU	Minimum Mapping Unit
NE	Natural England
NERC Act	Natural Environment and Rural Communities Act 2006
NGSS	National Grid substation
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
NTM	National Tree Map
ODOW	Outer Dowsing Offshore Wind
OnSS	Onshore Substation



PAWS	Plantations on Ancient Woodland Sites	
PEIR	Preliminary Environmental Information Report	
PHI	Priority Habitat Inventory	
PRoW	Public Rights of Way	
SSSI	Site of Special Scientific Interest	
Sp.	Species	
WFD	Water Framework Diretive	

Terminology

400kV cables	High voltage cables linking the OnSS to the NGSS.
400kV cable corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Total Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), Total Energies and GULF.
Baseline	The status of the environment at the time of assessment without the development in place.
Biodiversity Net Gain	An approach to development that leaves biodiversity in a measurably improved state than it was previously. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected, to ensure that the current loss of biodiversity through development will be halted and ecological networks can be restored.
Connection Area	An indicative search area for the NGSS.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Export cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.



Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which, the export cables running from the landfall to the onshore substation will be situated.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Onshore substation (OnSS)	The Project's onshore HVAC substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid.
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent, the limits shown on the works plans within which the Project may be carried out.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Study Area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.



1 March 2024

olume 3, Appendix 21.2: UK Habitat Classification Survey SLR Project No.: 410.V05356.00013

21.0 UK Habitat Classification Survey

21.1 Introduction

- Outer Dowsing Offshore Wind (ODOW) is a Nationally Significant Infrastructure Project (NSIP). An Environmental Impact Assessment (EIA) has been undertaken, the findings of which are presented within an Environmental Statement (ES), which accompanies a Development Consent Order (DCO) application under the Planning Act 2008.
- 2. SLR Consulting was commissioned by GoBe Consultants Ltd, whom has been instructed by GT R4 Limited (trading as ODOW Offshore Wind), on behalf of ODOW, to undertake a habitat survey of areas that may be affected by the construction and operation of the onshore aspects of the Project (see Volume 1, Chapter 3: Project Description (document reference 6.1.3).
- 3. This report presents the findings of the habitat survey undertaken between November 2022 and October 2023. It seeks to establish baseline conditions and identify habitats that are important ecological features (irrespective of the animal species they may support) and is presented as an appendix to support Volume 1, Chapter 21: Onshore Ecology (document reference 6.1.21) of the ES. The assessment of impacts resulting from the Project is covered in the Chapter 21 (document reference 6.1.21).
- 4. Initial identification and classification of similar habitat types (i.e., habitat polygons and linear features) had previously been undertaken primarily via interpretation of aerial imagery in April and May 2022 and refined in May 2022, with additional ground-truthing of sample areas in July 2022 as reported in the Preliminary Environmental Information Report (PEIR) Volume 2, Appendix 21.2: Initial Habitat Study (SLR Consulting, 2023b).

21.1.1 The Project

5. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) located approximately 54km from the Lincolnshire coastline, export cables to landfall, onshore cables, an onshore substation, connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description 6.1.3 (document reference 6.1.3) for full details).



- 1 March 2024 SLR Project No.: 410.V05356.00013
- 6. The ES references the Project's 'Order Limits' which comprises the extent of the land for which the DCO application has been made. Onshore it reflects the landfall, the Onshore Export Cable Corridor (a typically80m wide corridor around a centre line totalling approximately 70km in length)the Onshore substation (OnSS), a 400kV cable corridor connecting the OnSS to the Connection Area (an indicative search zone for the National Grid substation (NGSS) in to which the project will ultimately connect.
- 7. Due to the linear footprint of the Project, the Survey Area for some receptors is relatively large-scale, therefore to assist with the interpretation and explanation of associated data, the Order Limits have been split into segments. The extent of these segments has been aligned with key geographical features such as roads or rivers which cross the Order Limits.
- 8. The segments for the onshore Order Limits are shown in Table 21.1 below.

Table 21.1: Onshore Order Limits Segment Names

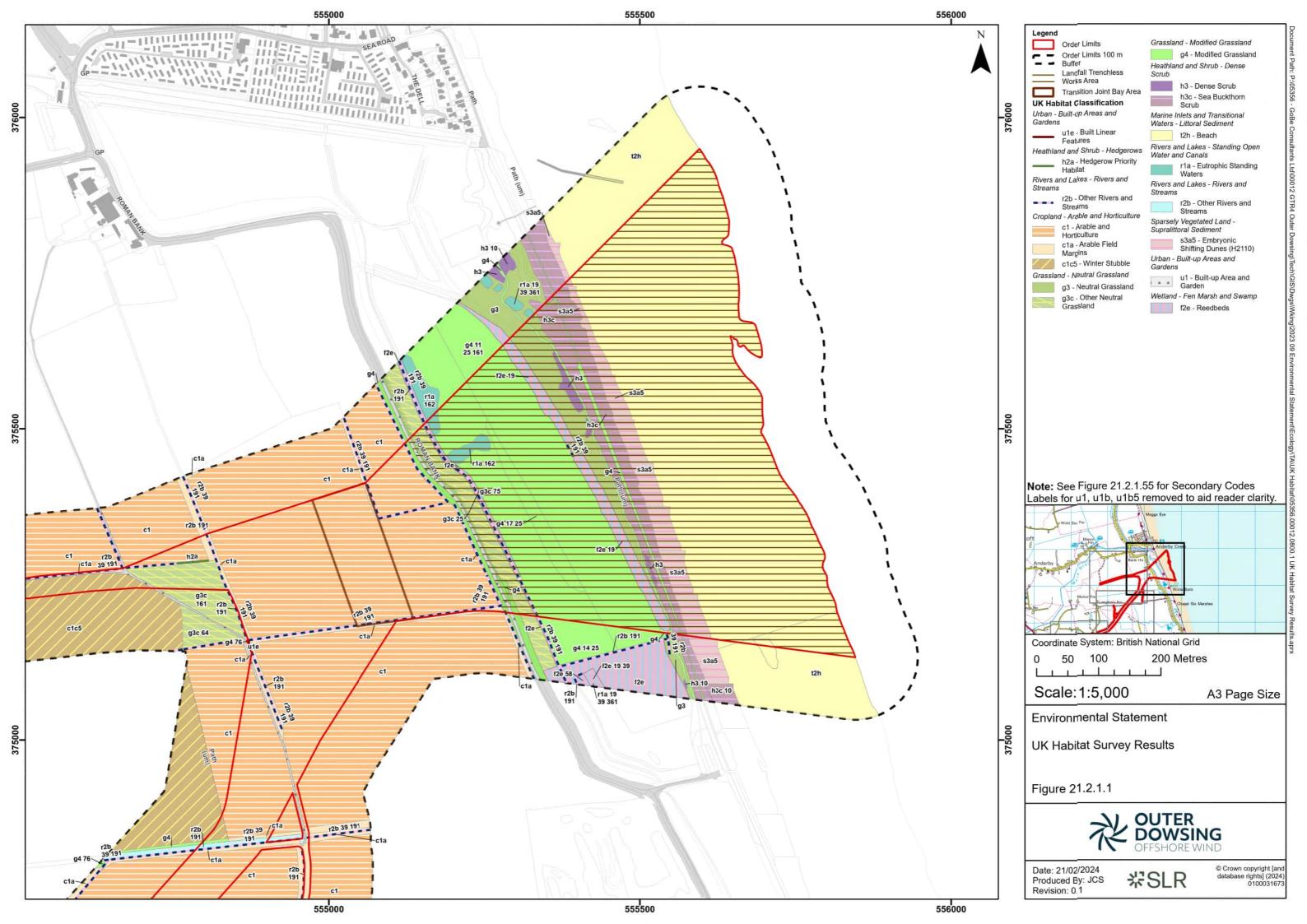
Segment Name
ECC 1: Landfall to A52 – Hogsthorpe
ECC 2: A52 – Hogsthorpe to Marsh Lane
ECC 3: Marsh Lane to A158 - Skegness Road
ECC 4: A158 – Skegness Road to Low Road
ECC 5: Low Road to Steeping River
ECC 6: Steeping River to Fodder Dike Bank/Fen Bank
ECC 7: Fodder Dike Bank/Fen Bank to Broadgate
ECC 8: Broadgate to Ings Drove
ECC 9: Ings Drove to Church End Lane
ECC 10: Church End Lane to The Haven
ECC 11: The Haven to Marsh Road
ECC 12: Marsh Road to Fosdyke Bridge
ECC 13: Surfleet Marsh OnSS/Marsh Drove to the NGSS
ECC 14: Surfleet Marsh OnSS/Marsh Drove to Connection Area

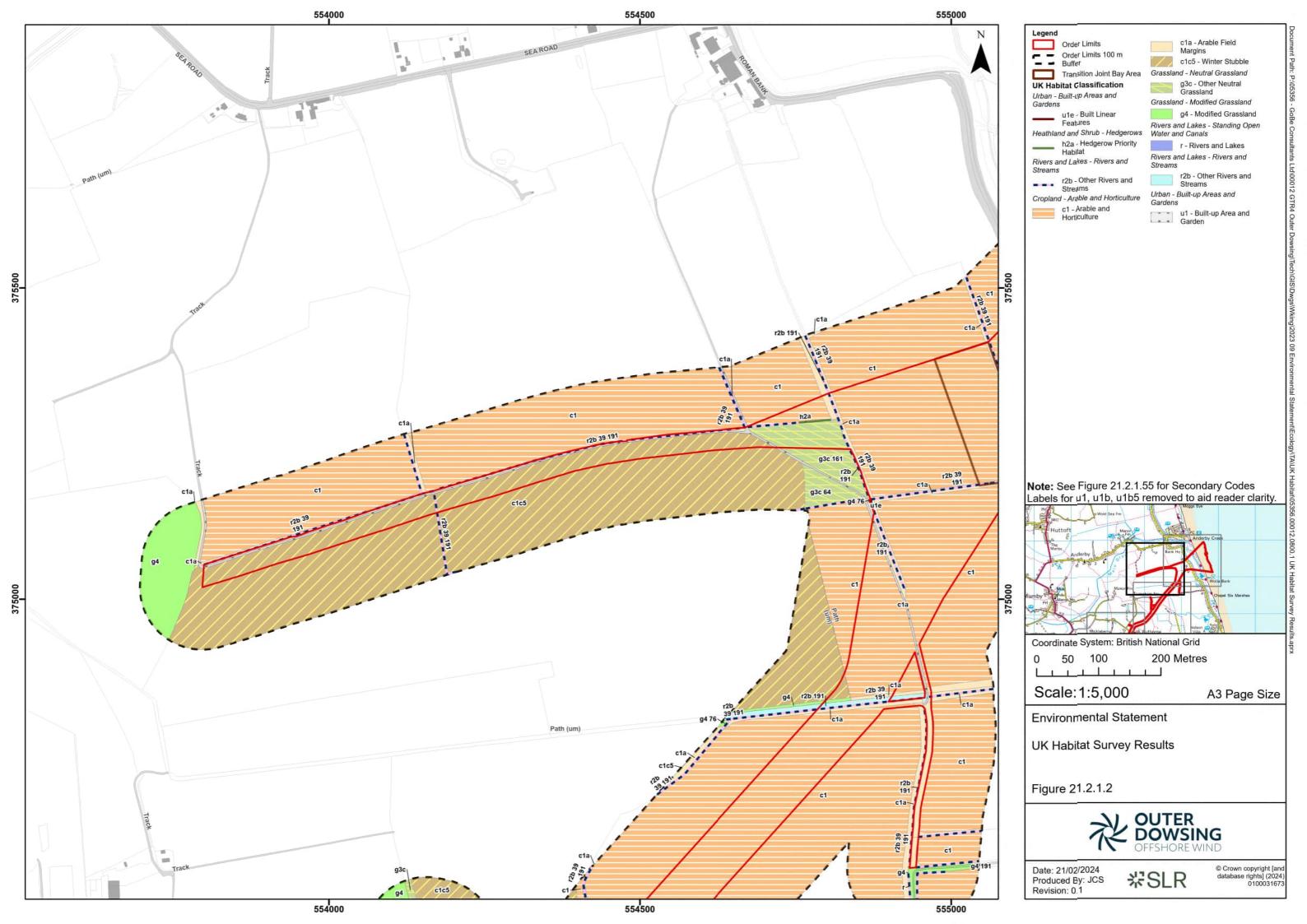


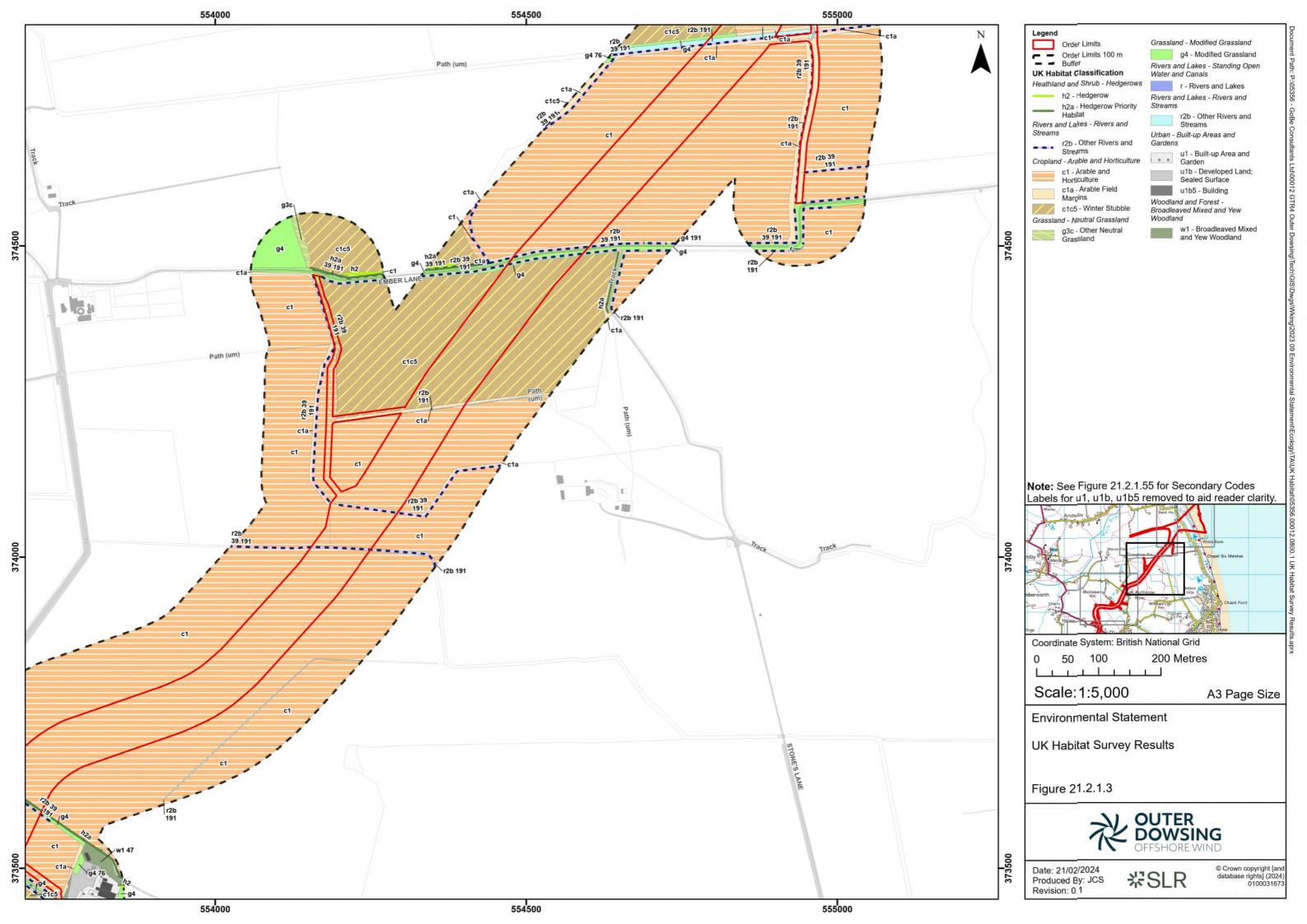
21.1.2 Survey Area

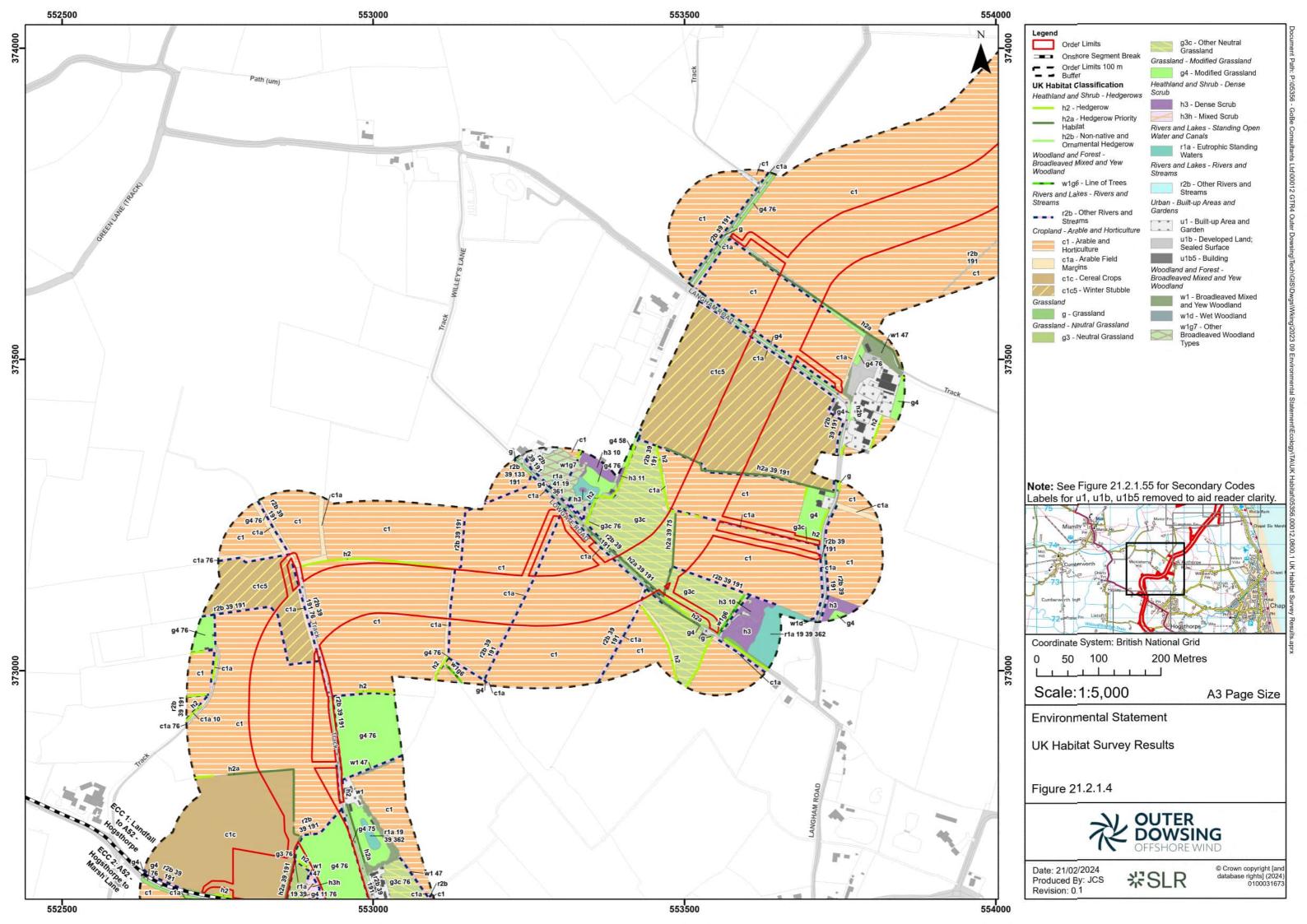
9. The survey area for the habitat assessment initially considered the Project's onshore boundary (as documented in the PEIR) plus a 100m buffer radius from it, that was under consideration at the time of the initial habitat surveys (SLR Consulting, 2023a). As the project design has progressed, the proposed project footprint and buffer zones have been reduced to the impacted areas of the Order Limits. plus a 100m buffer radius. The habitat survey area is shown across Figures 21.2.1.1 – 21.2.1.53.

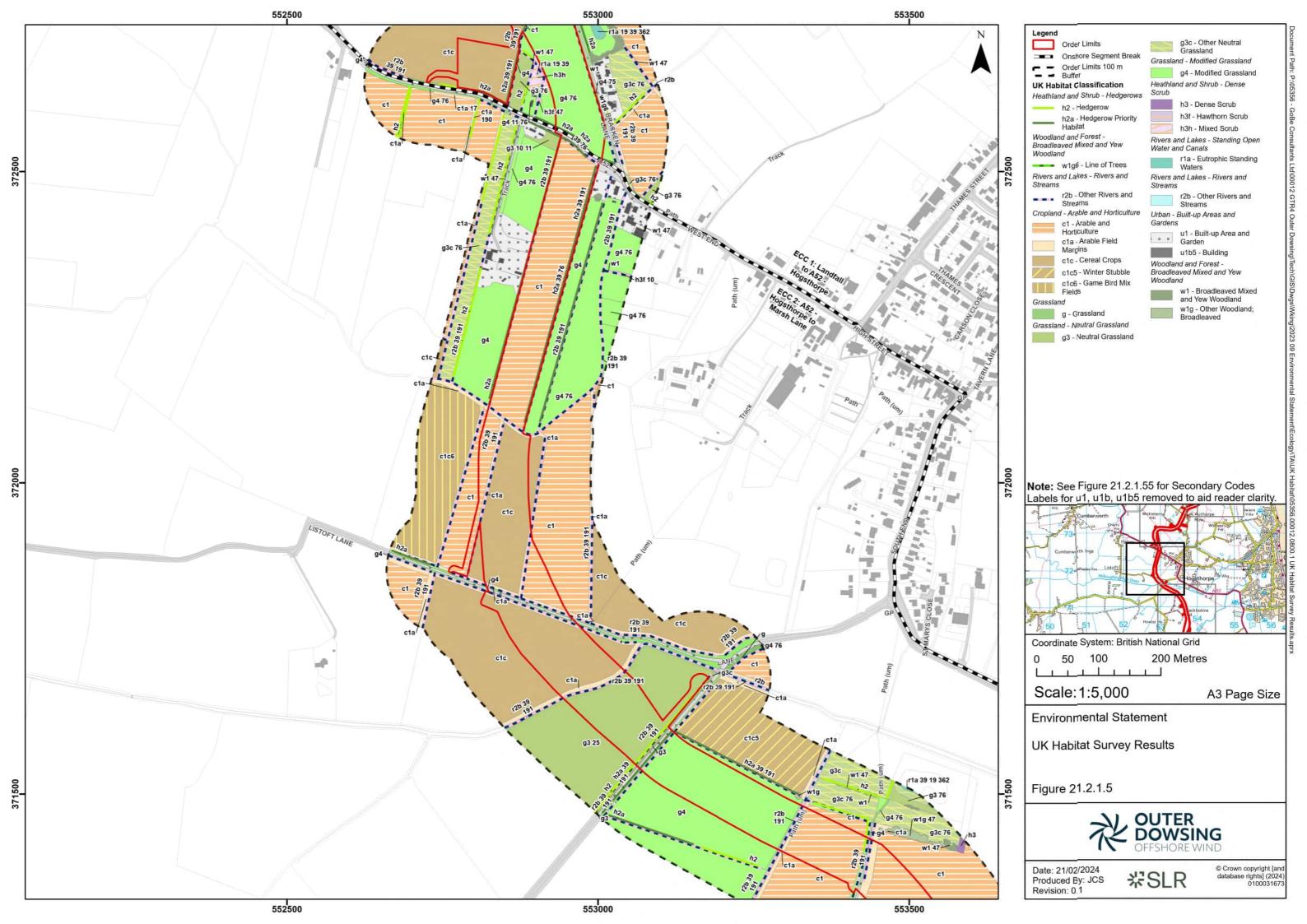


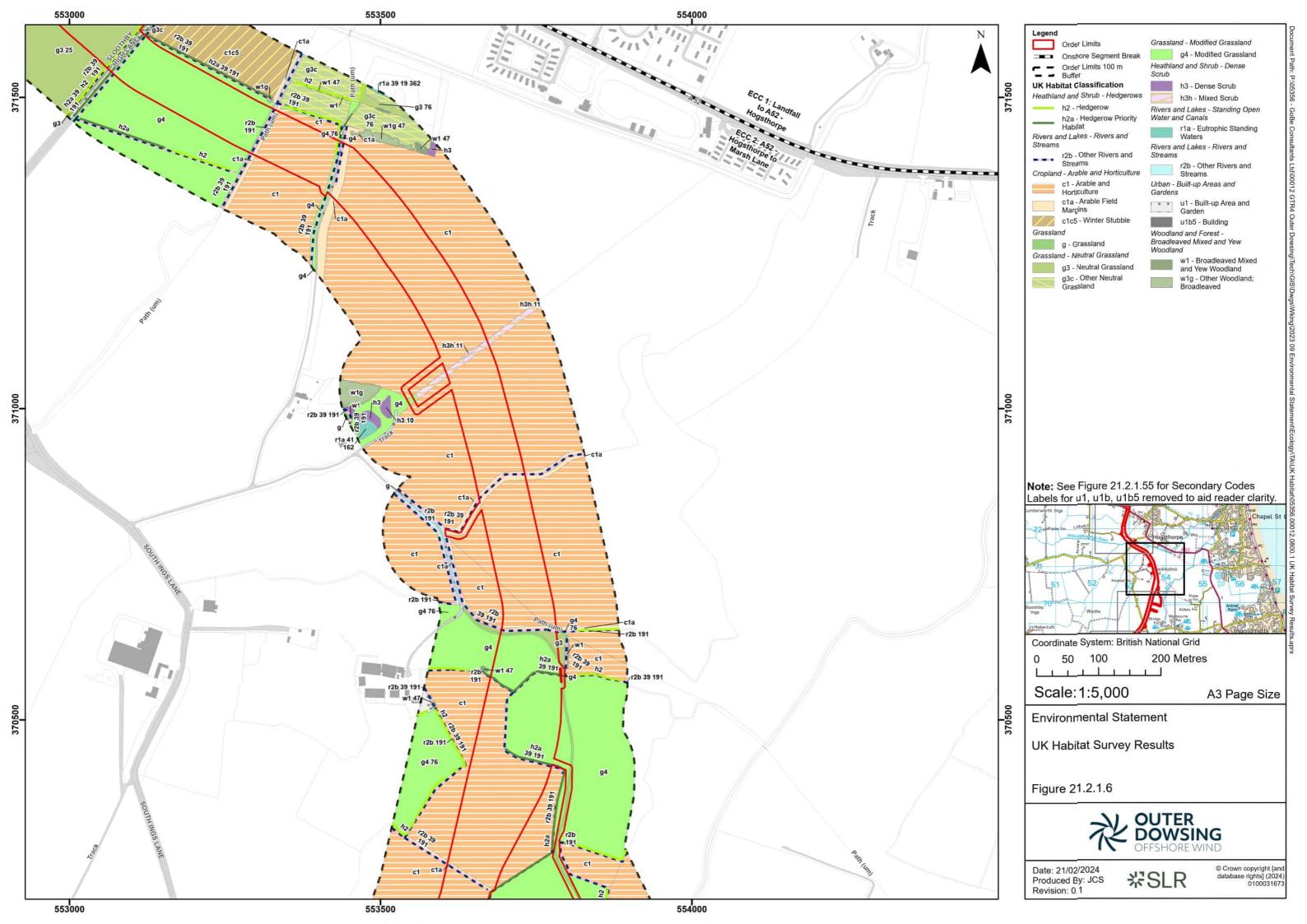


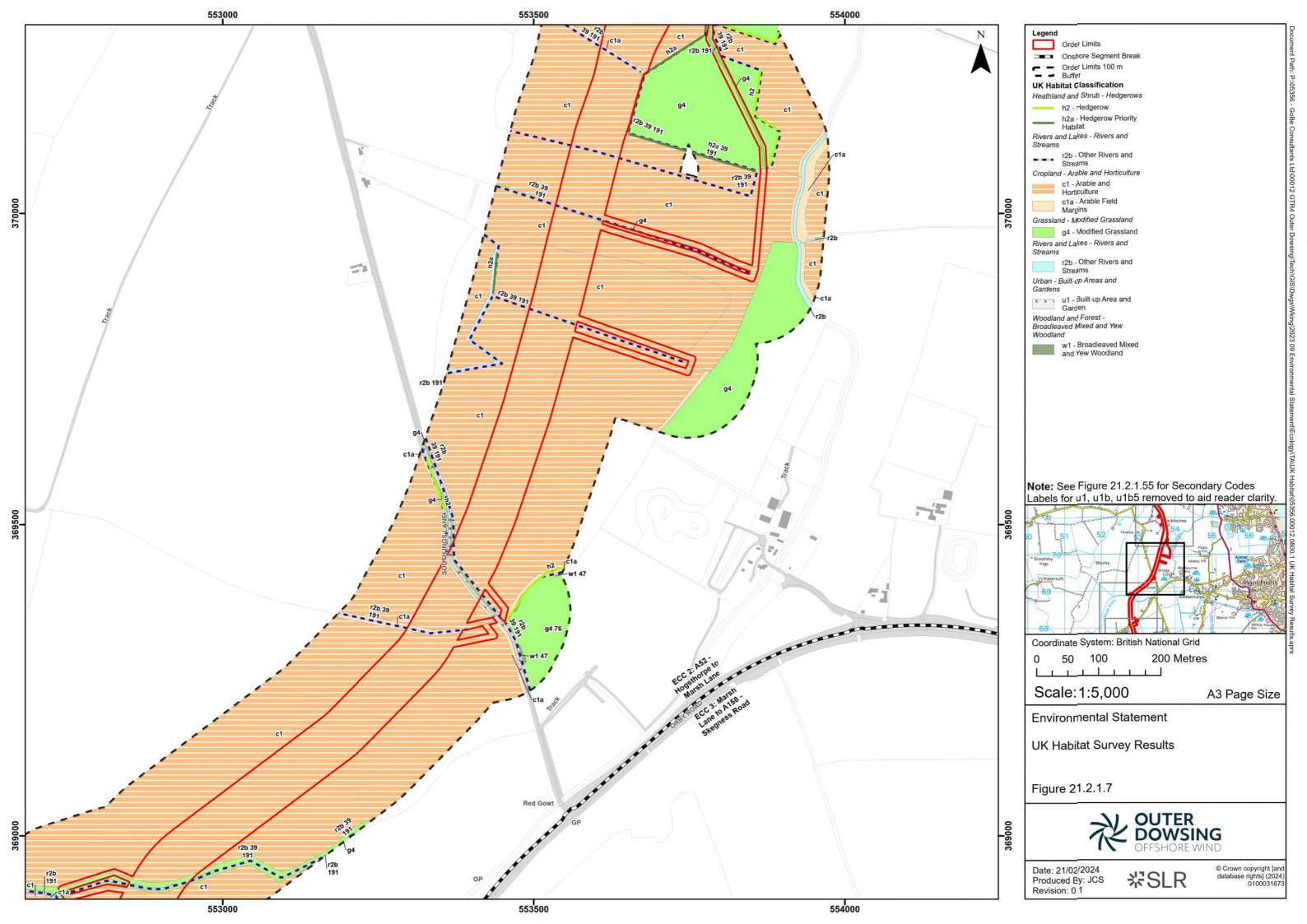


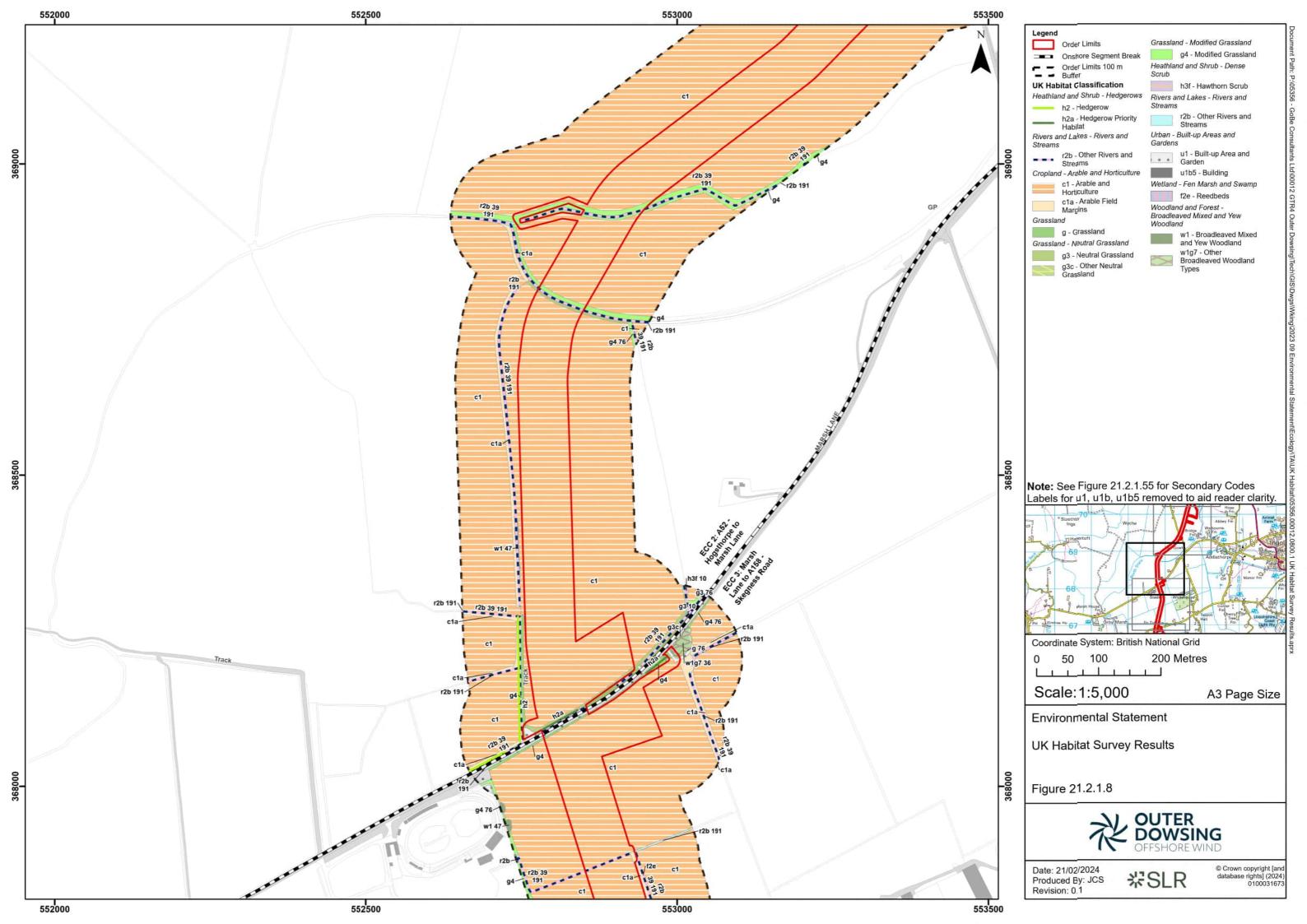


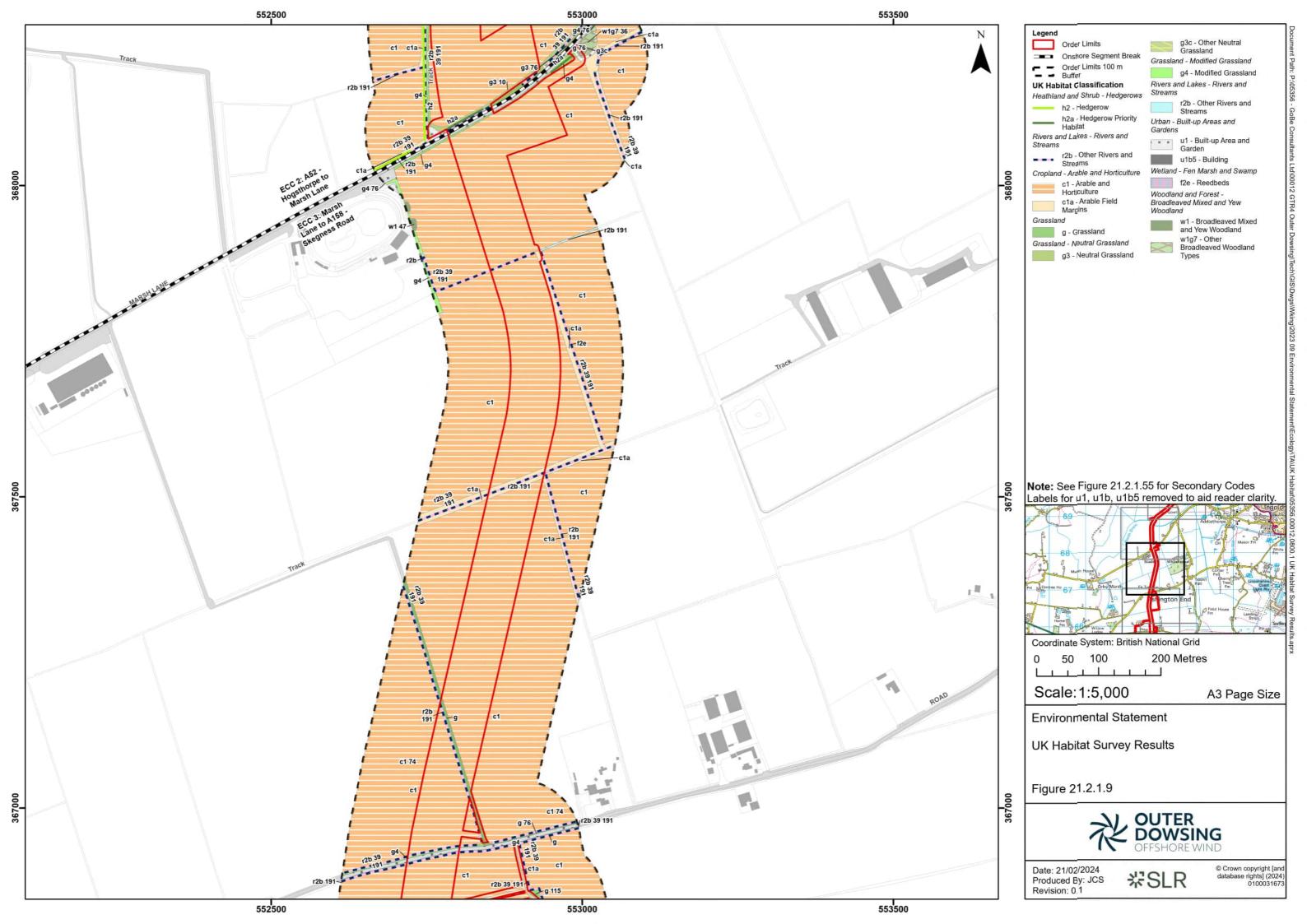


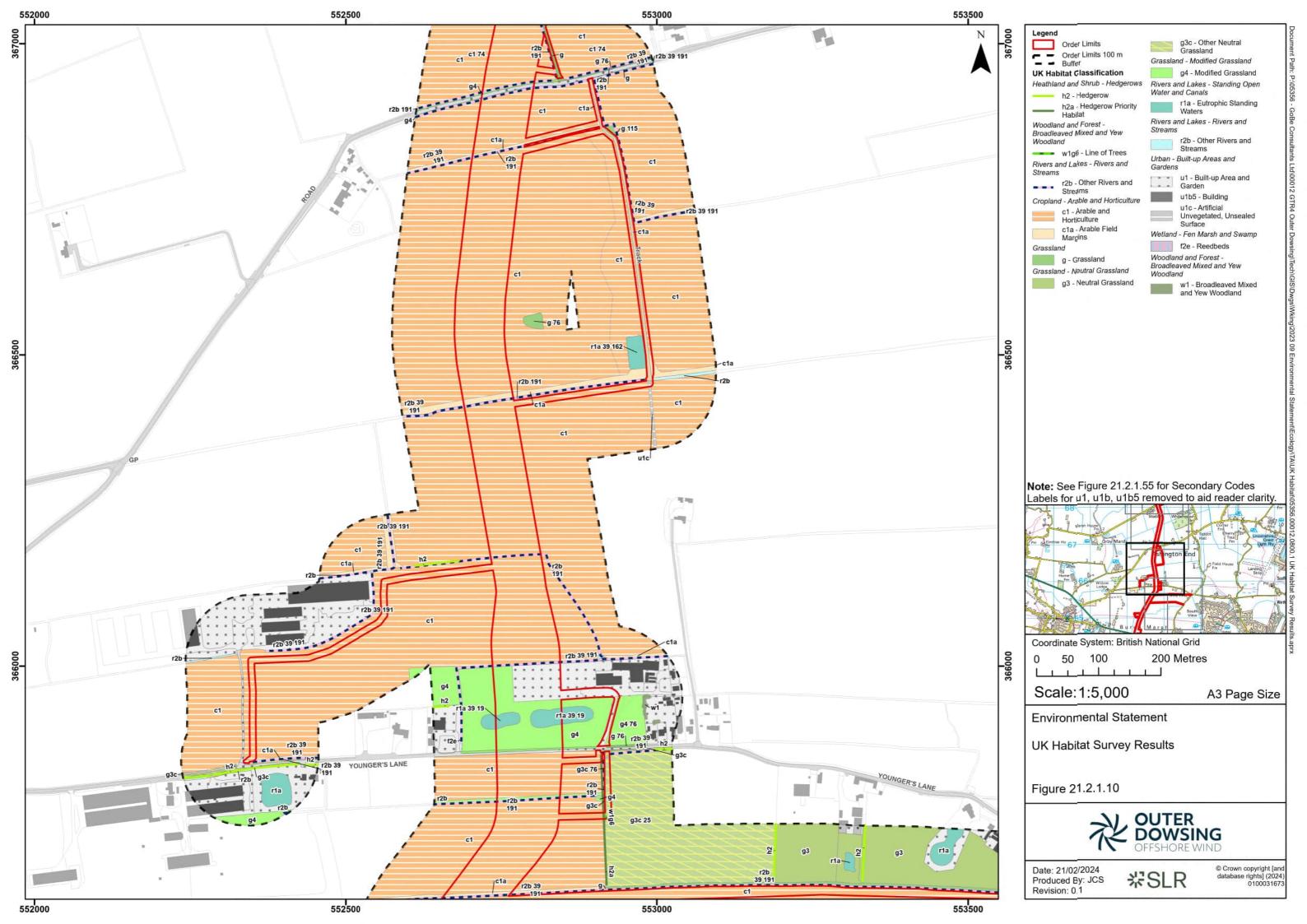


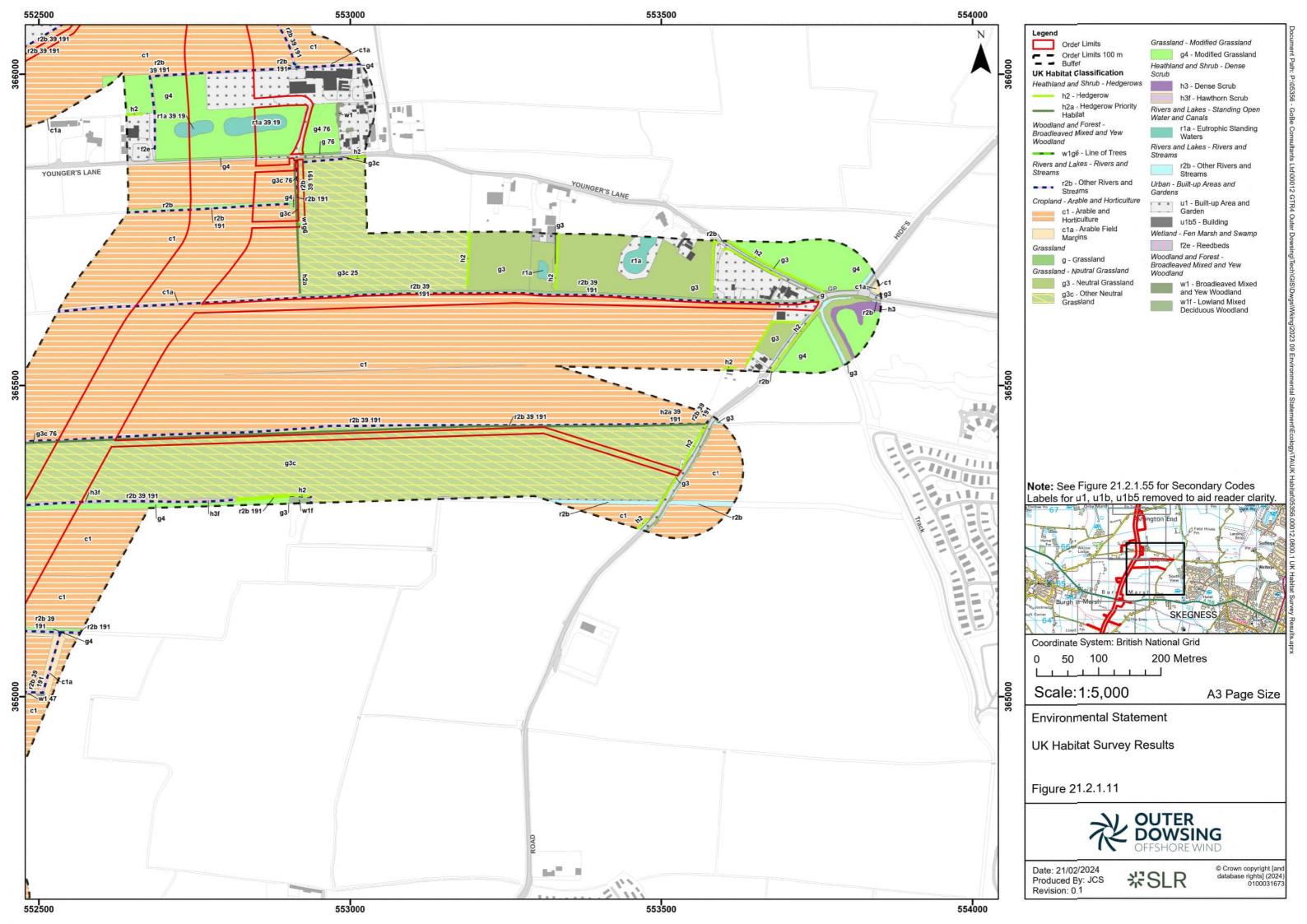


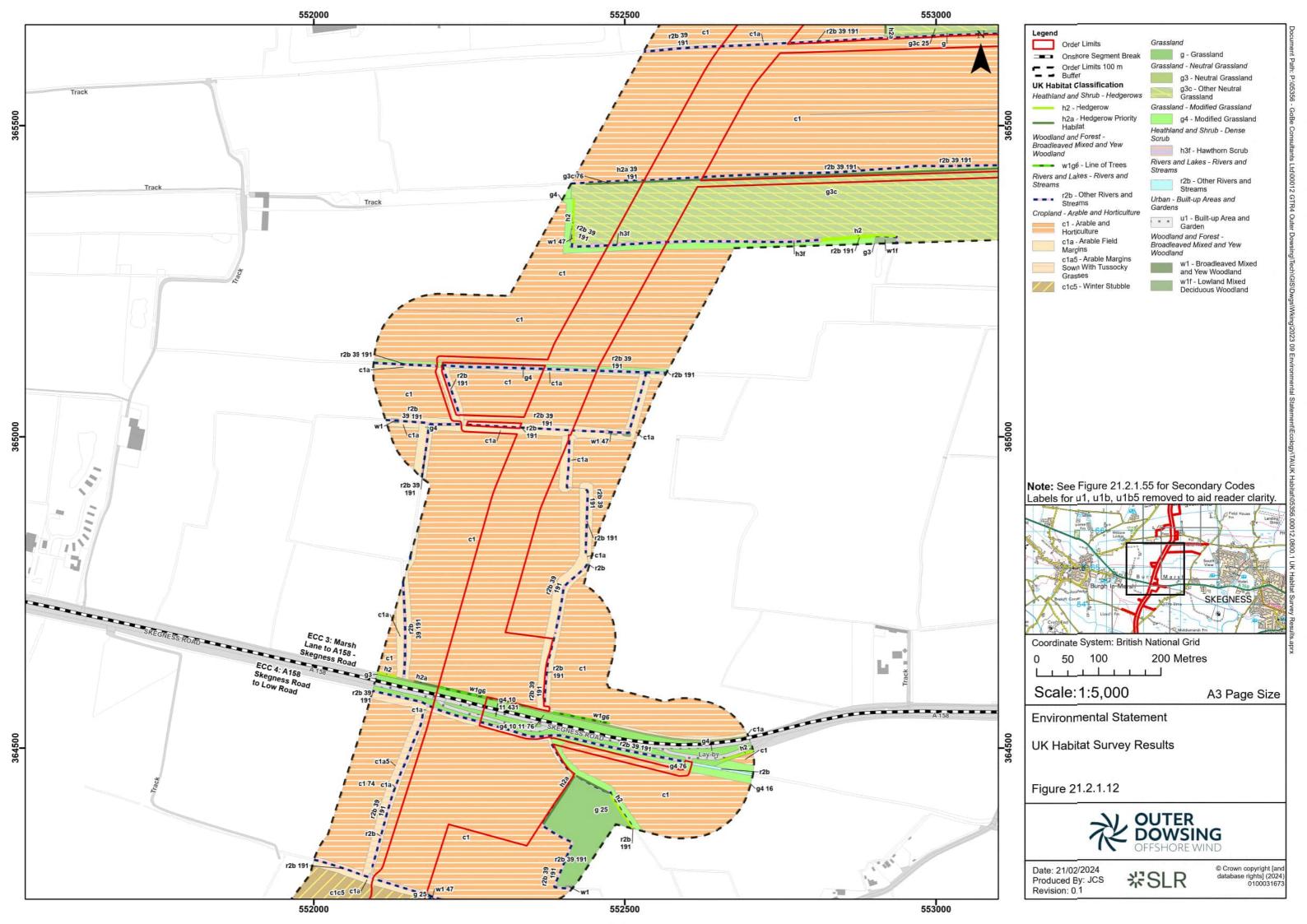


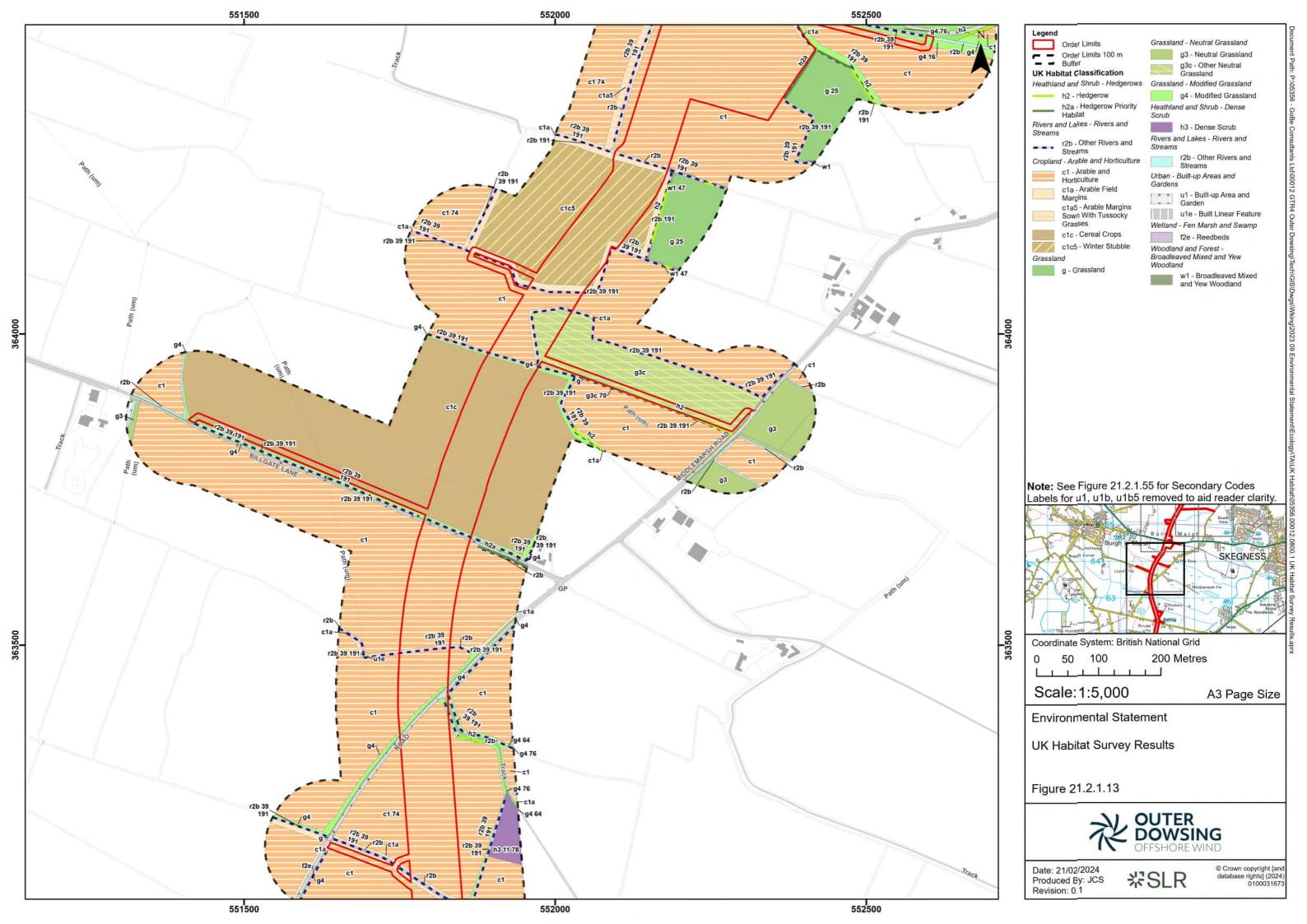


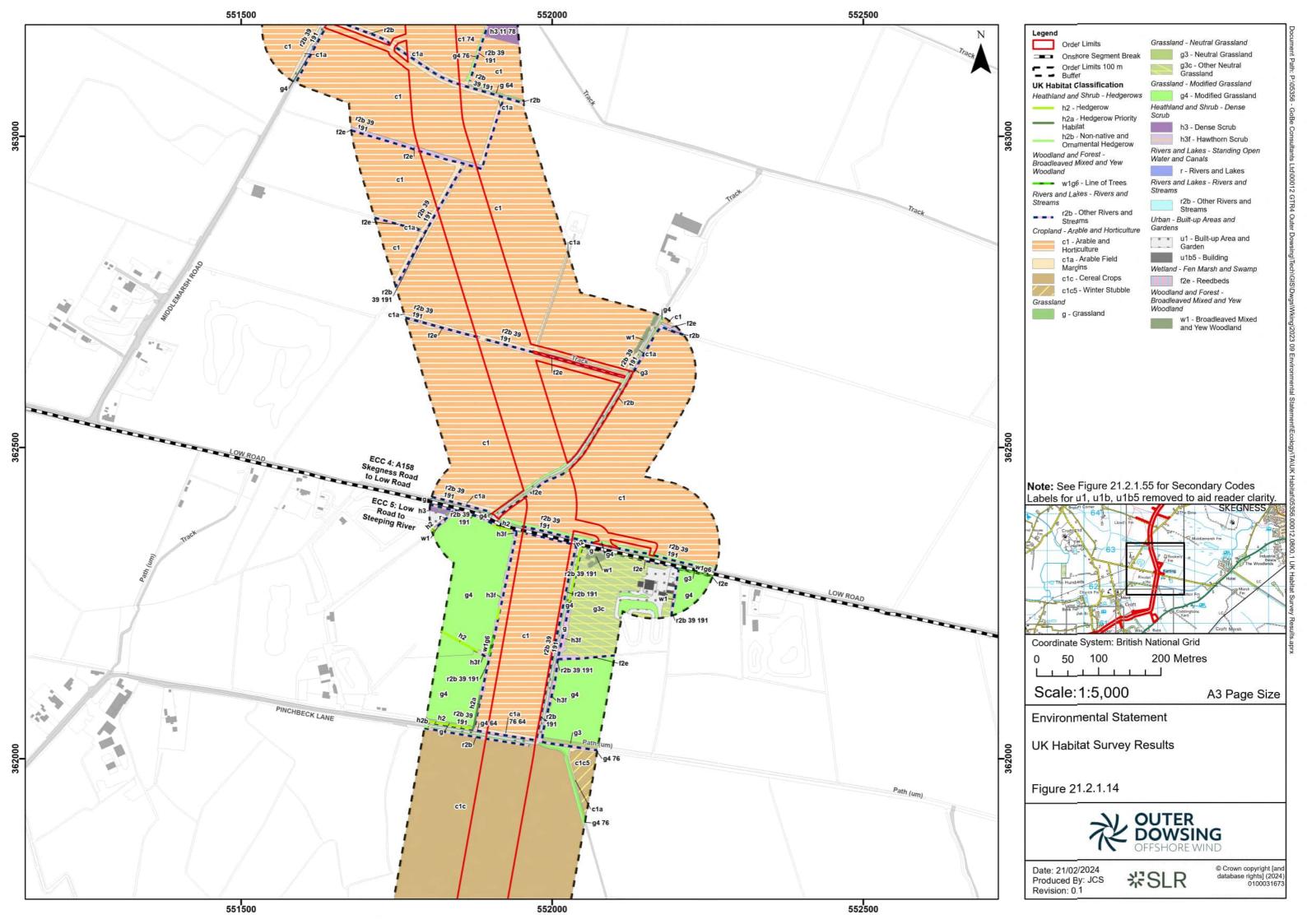


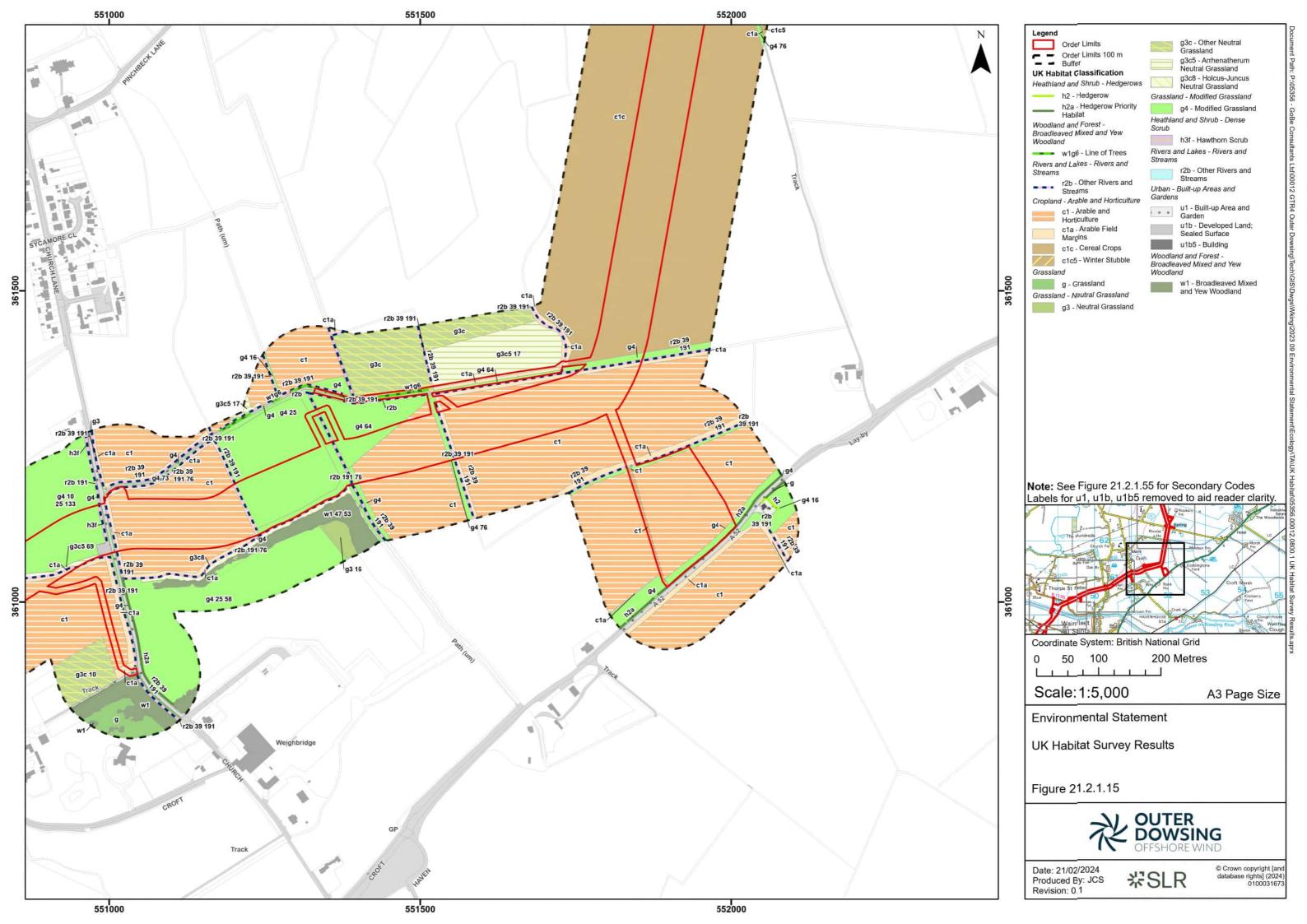


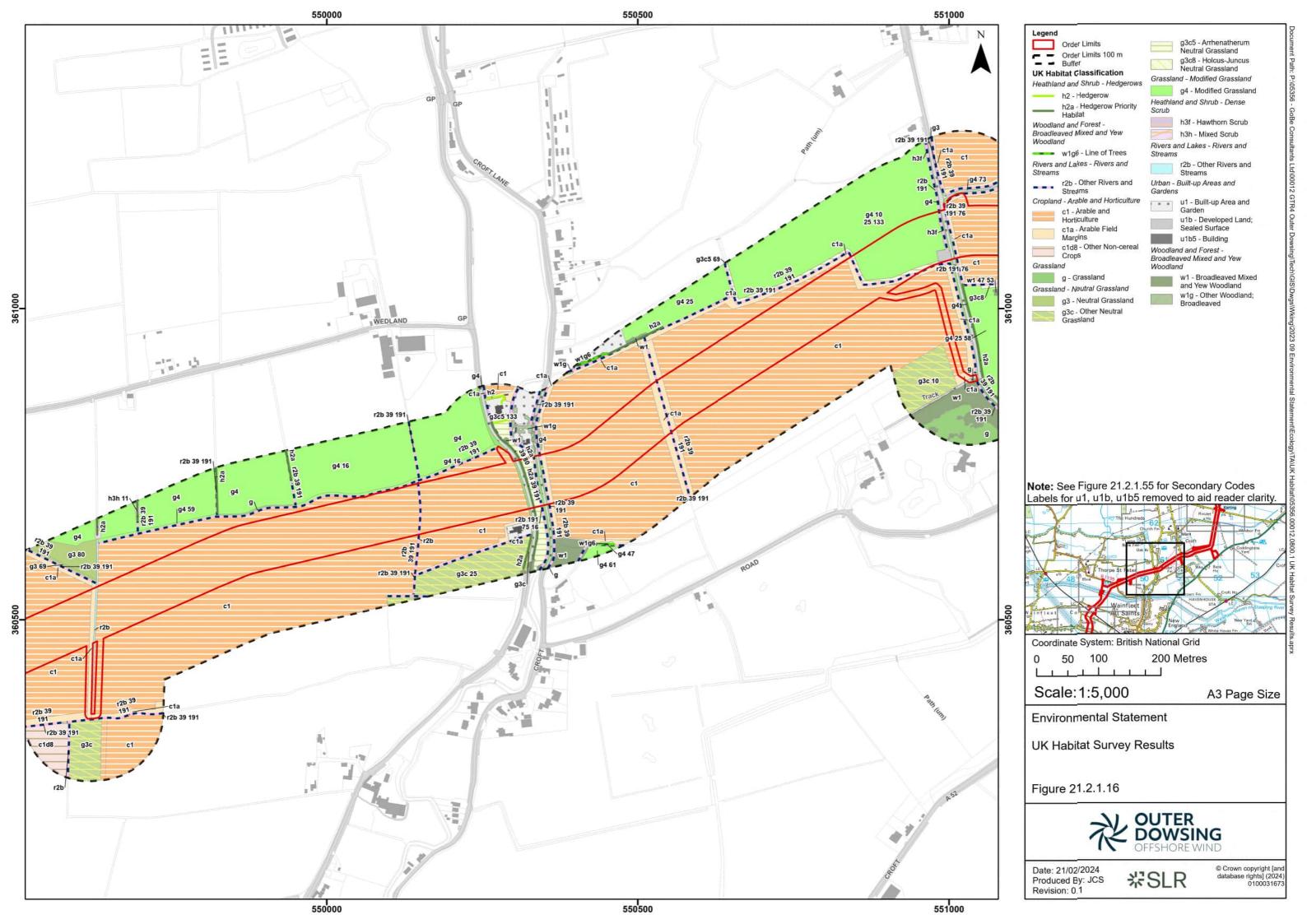


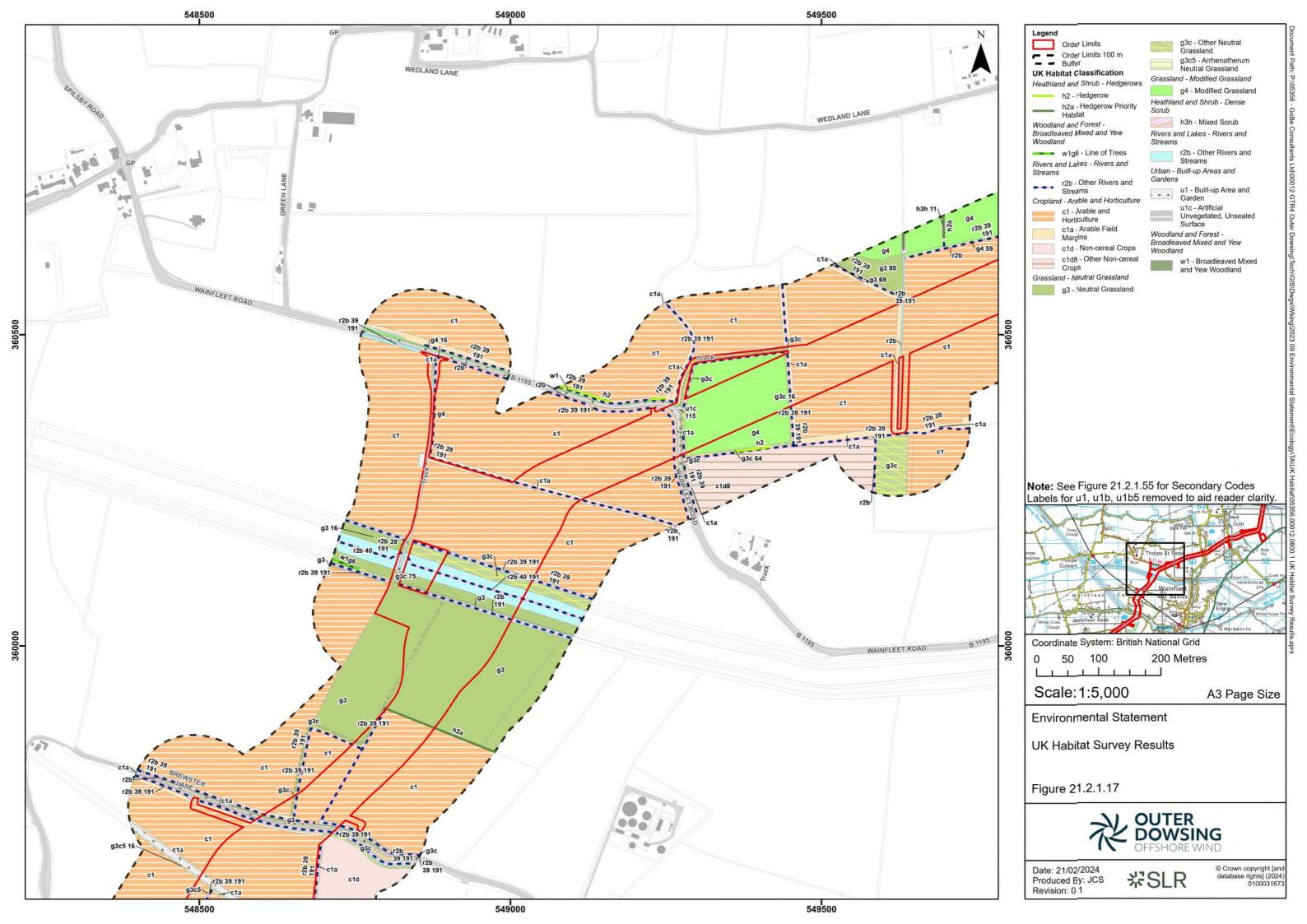


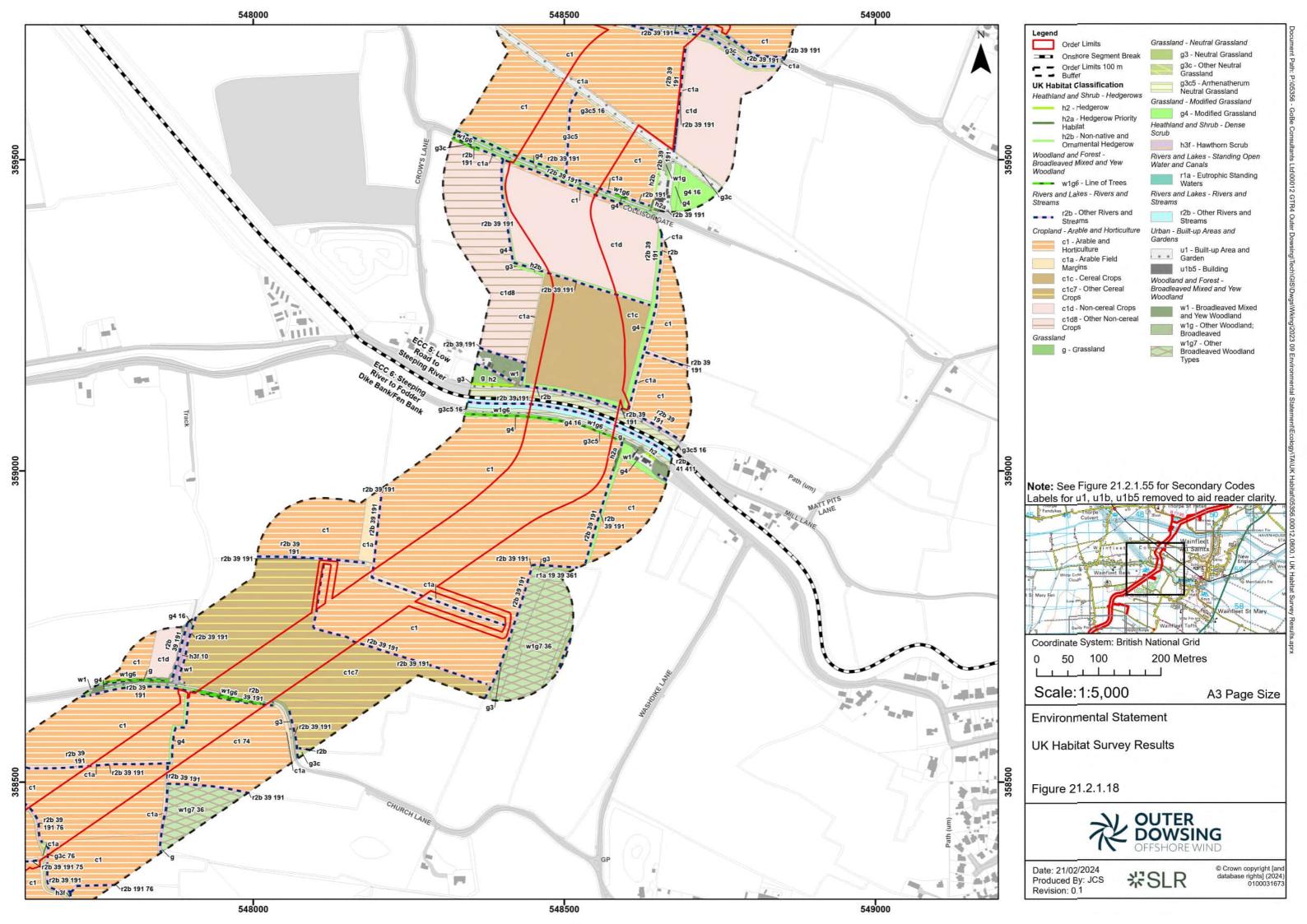


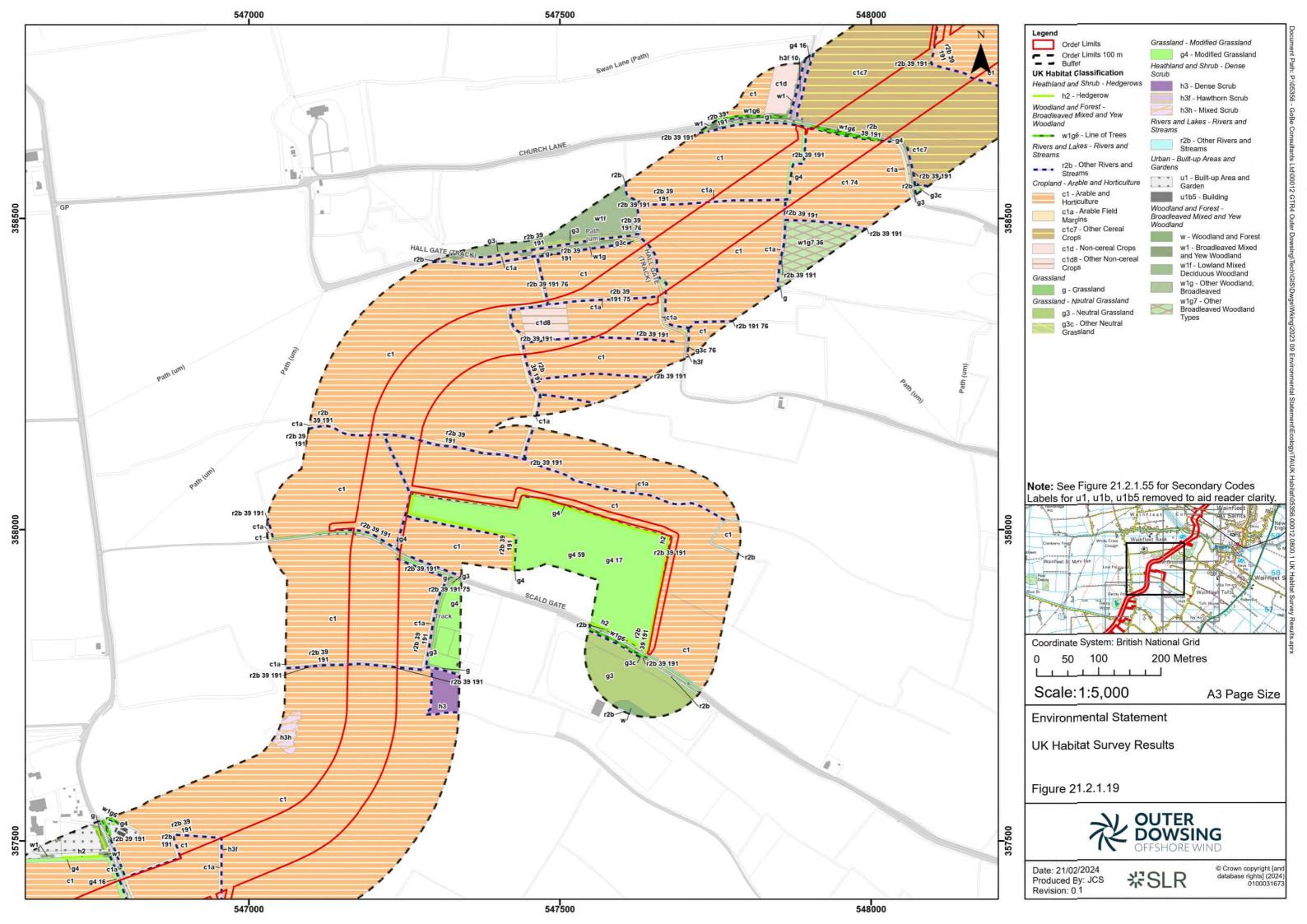


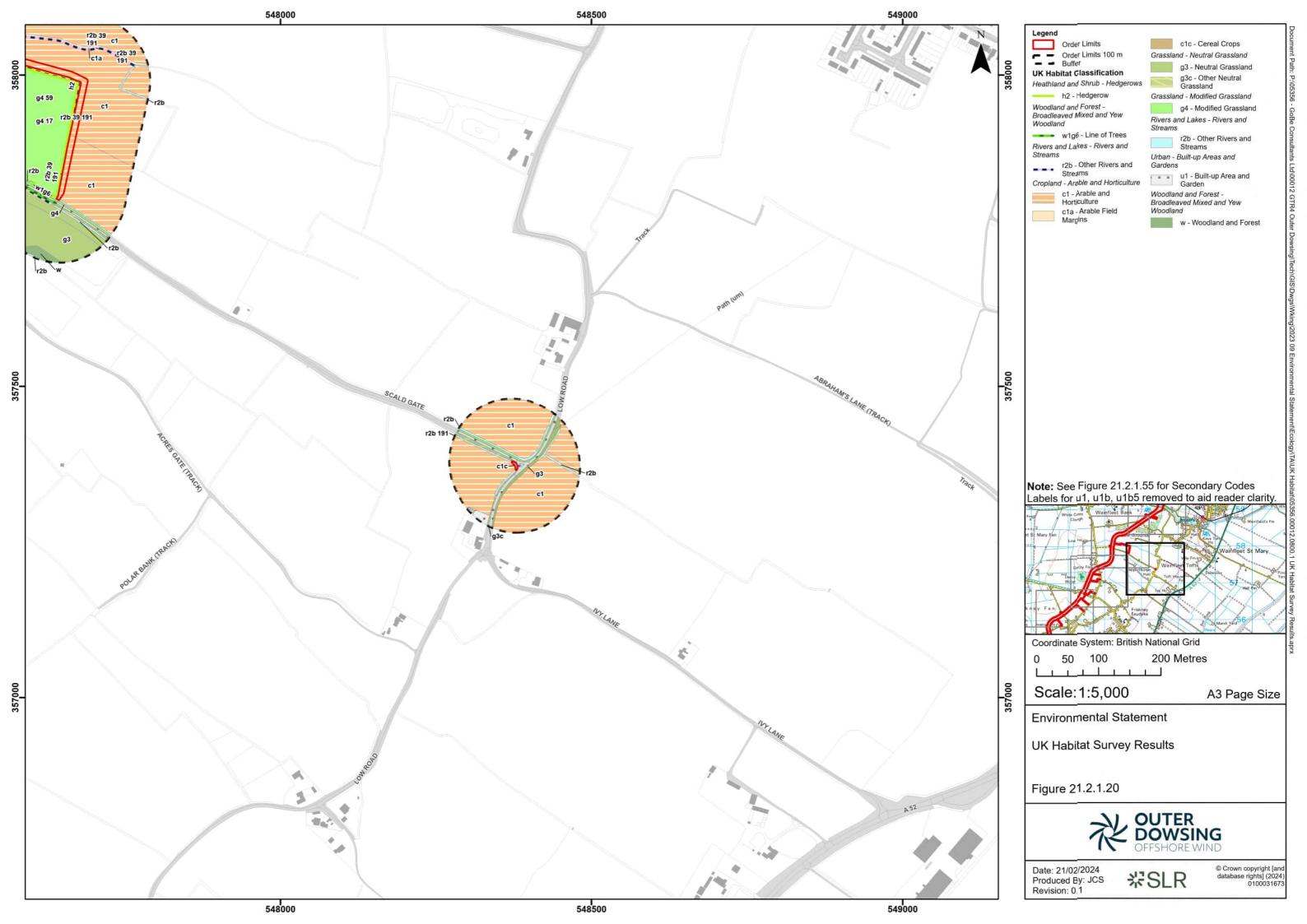


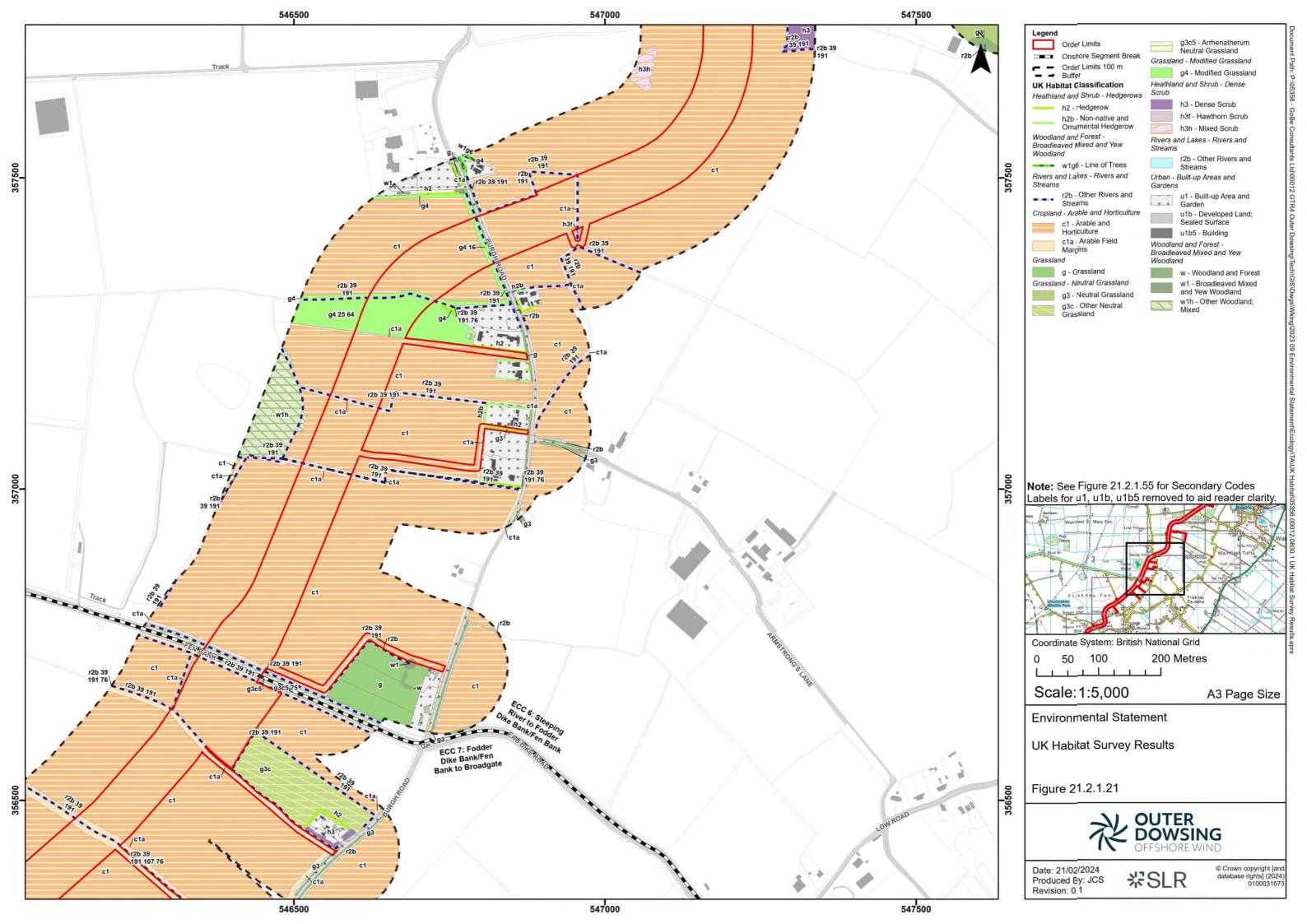


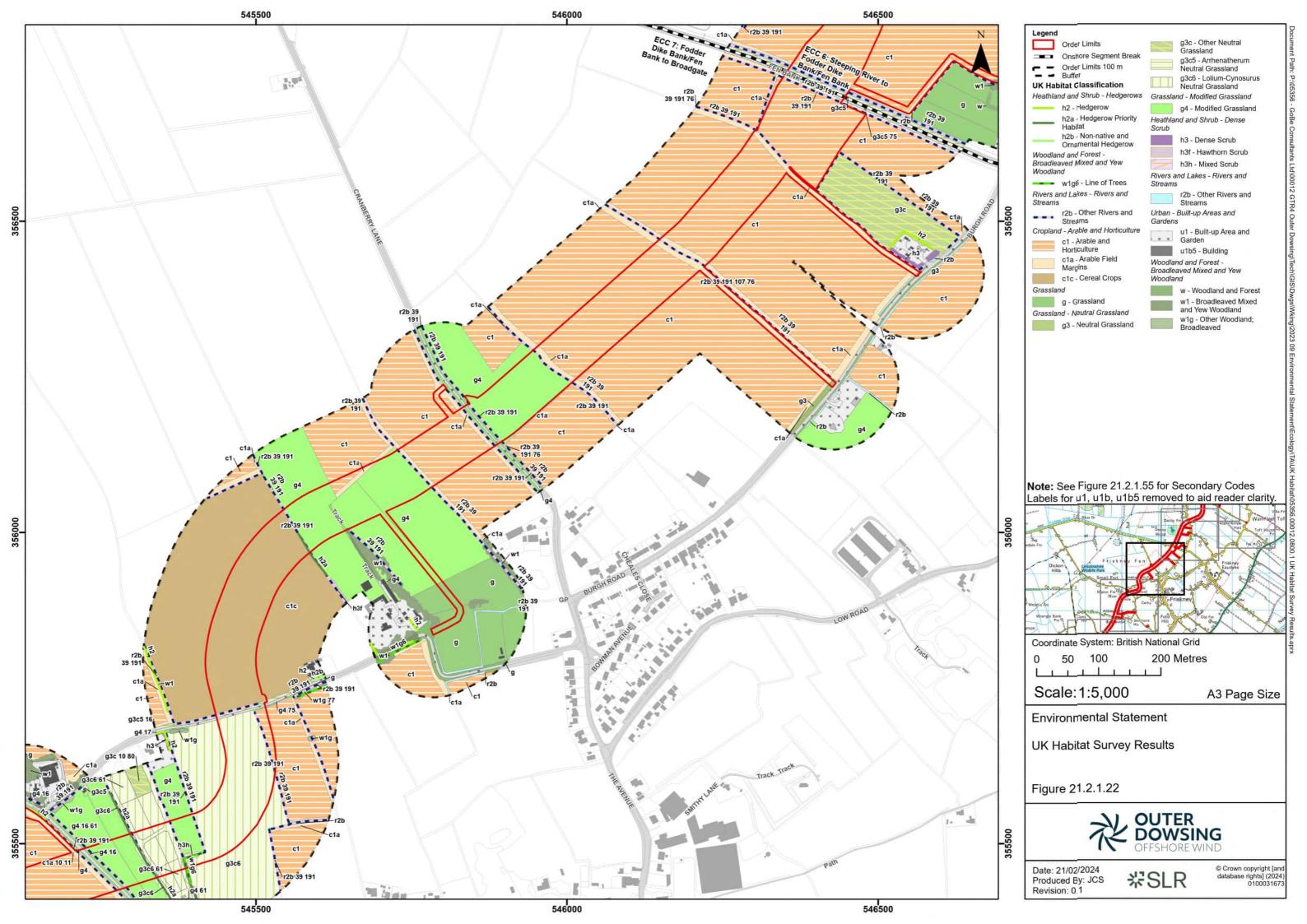


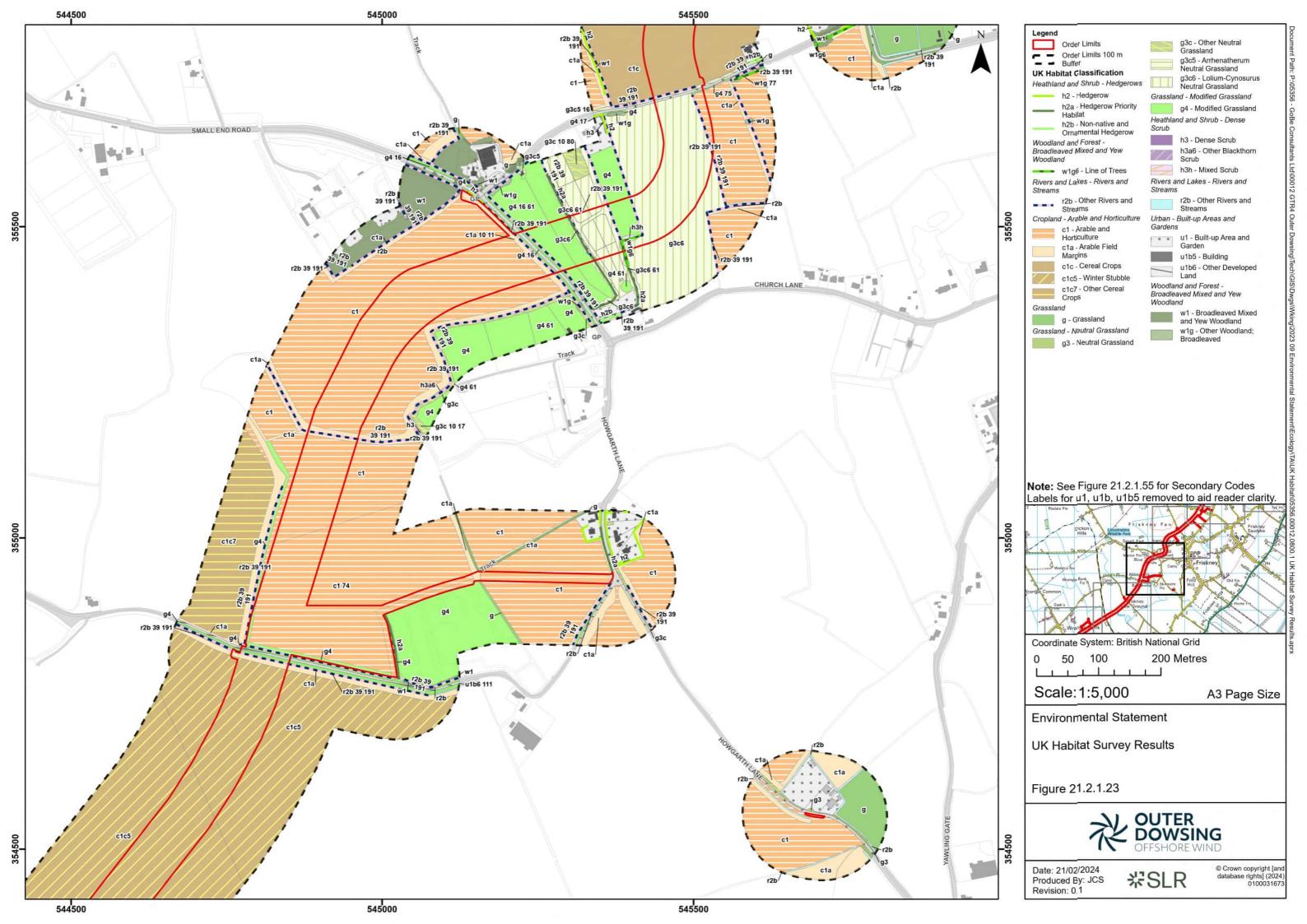


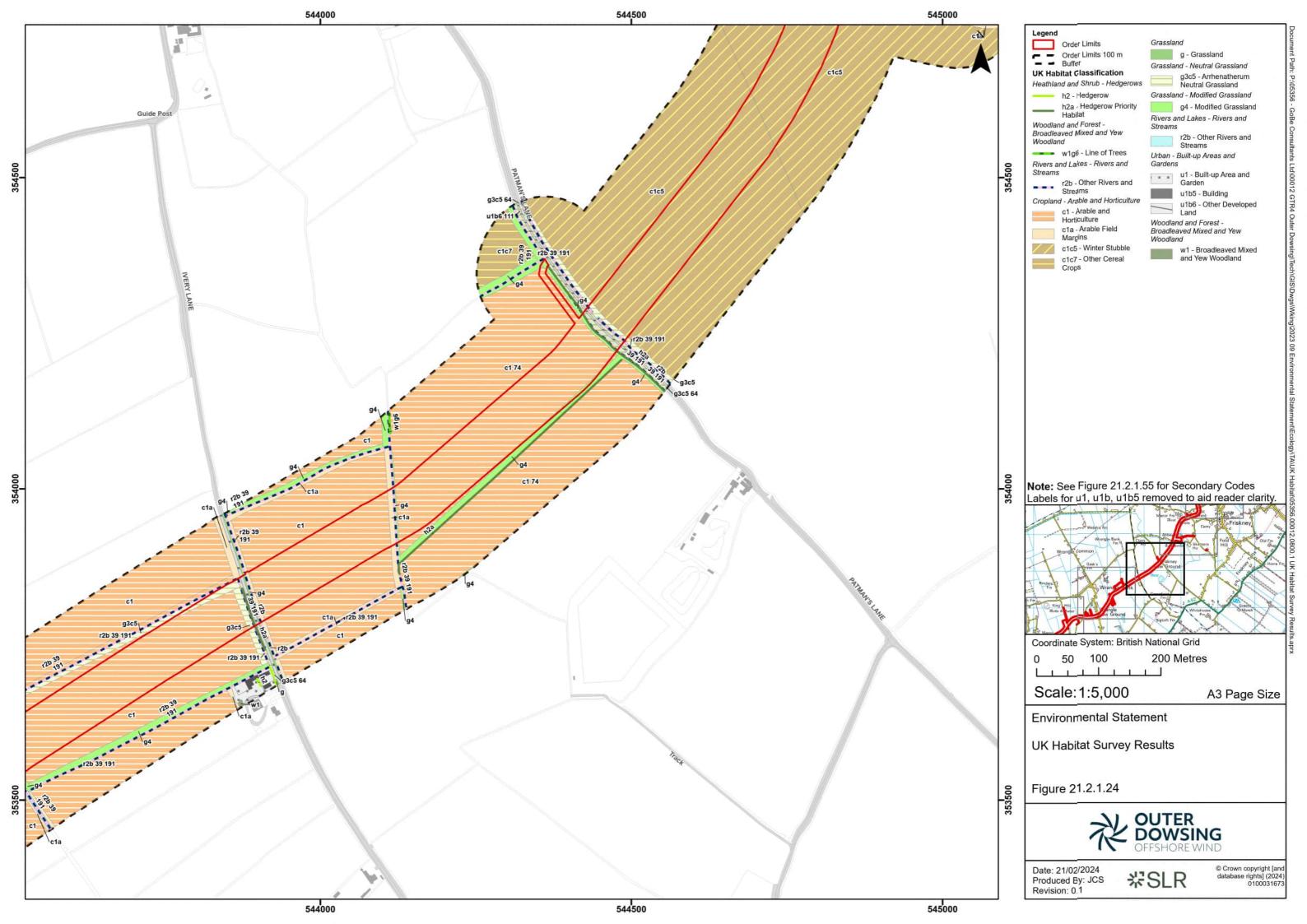


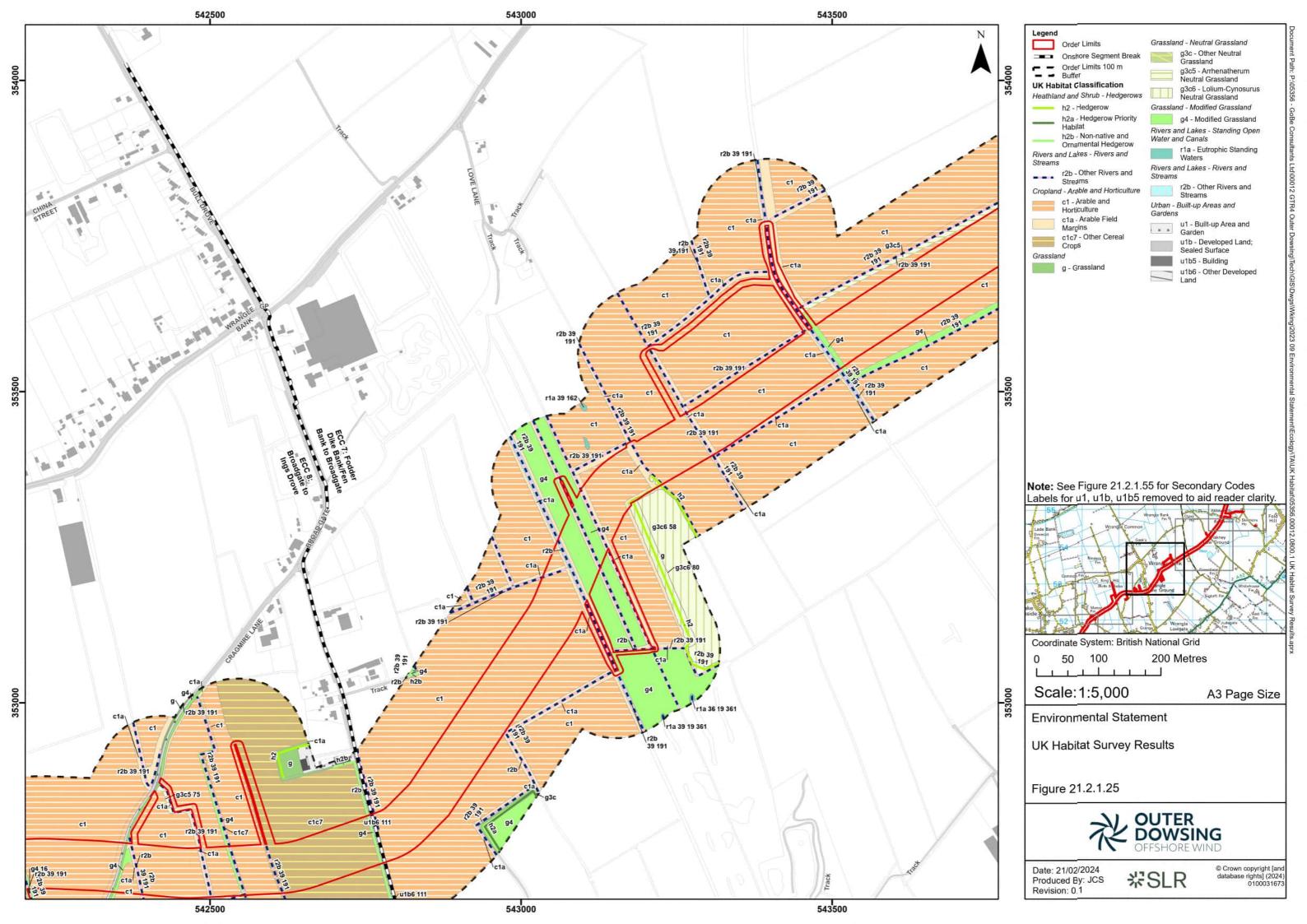


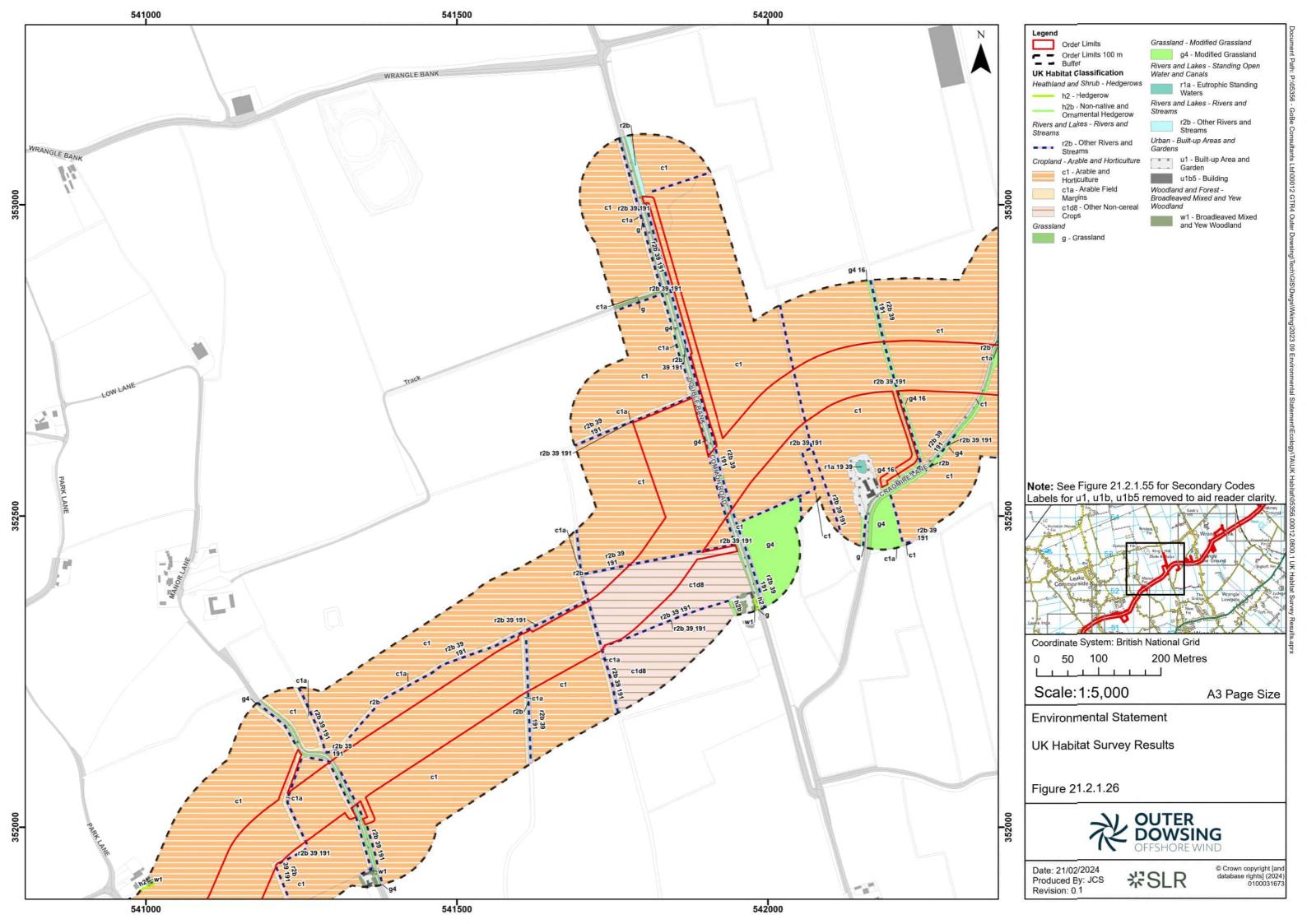


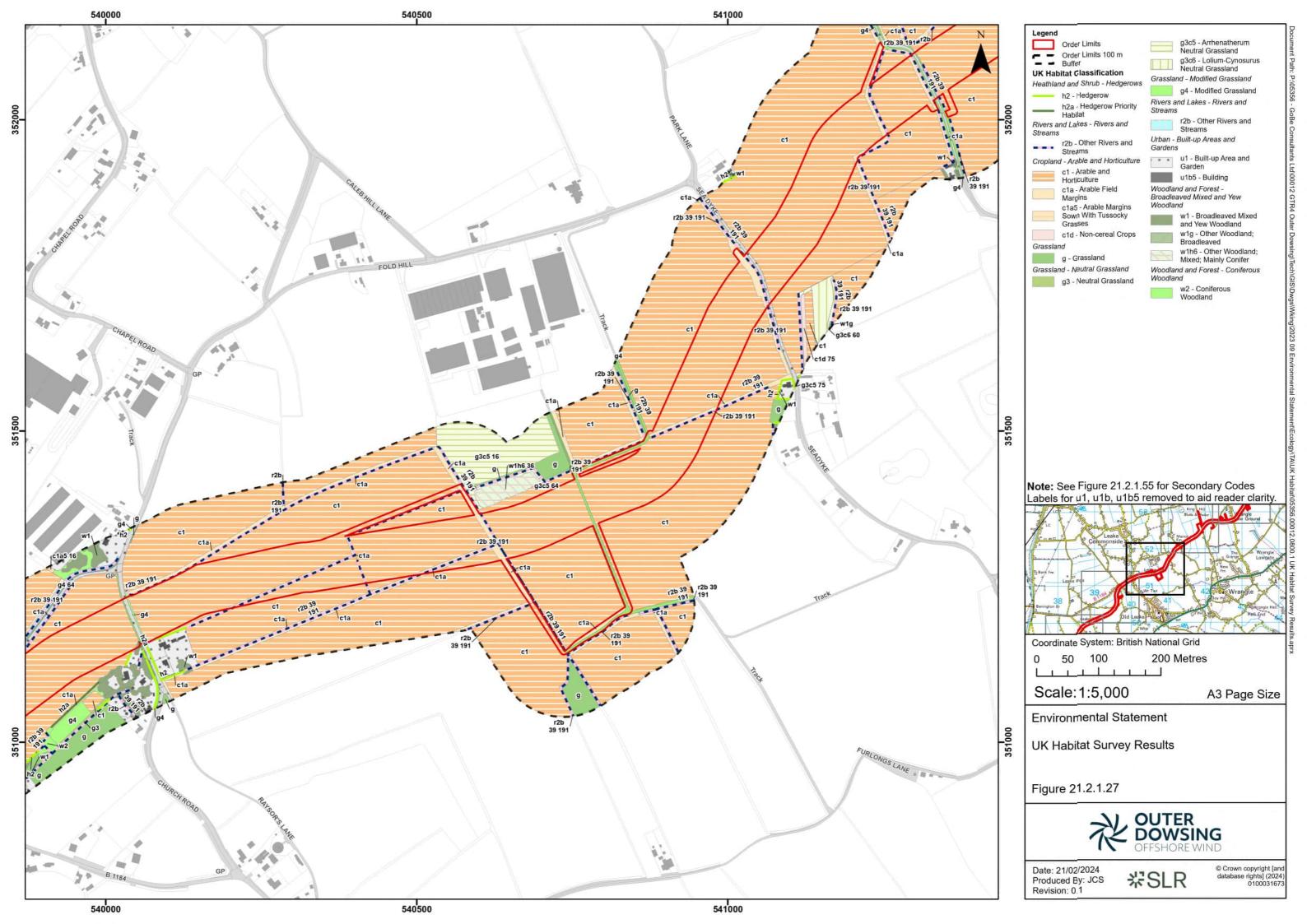


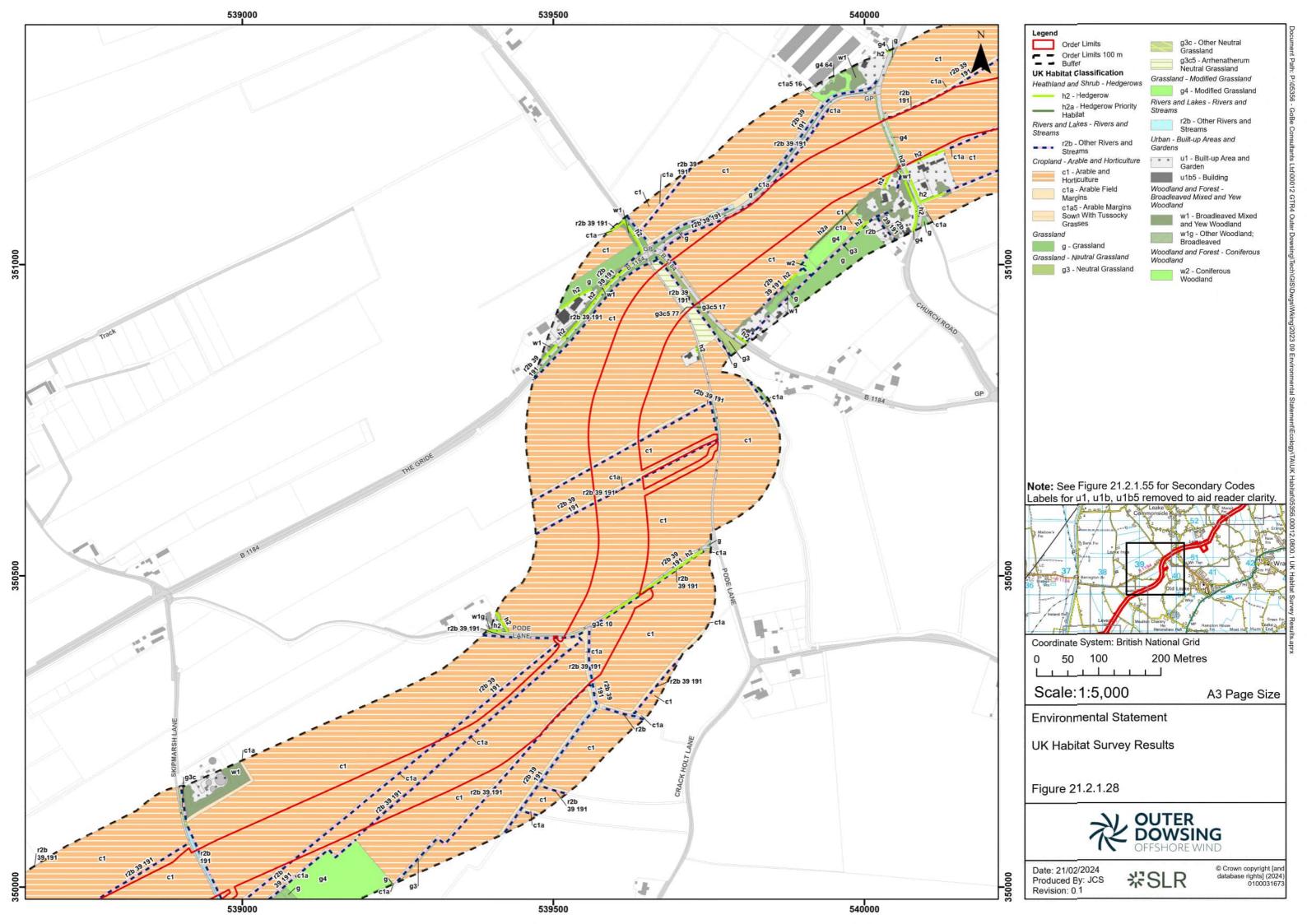


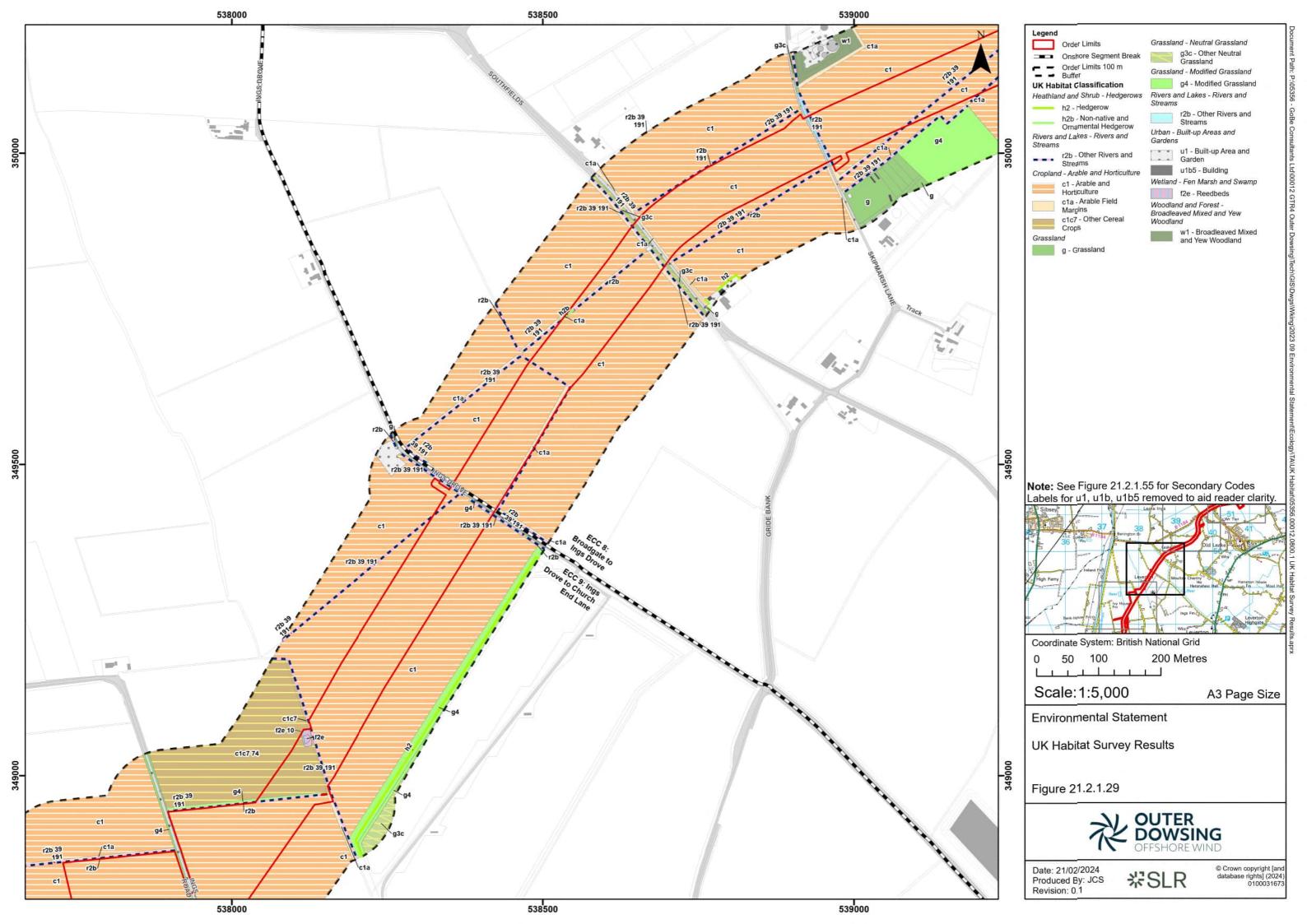


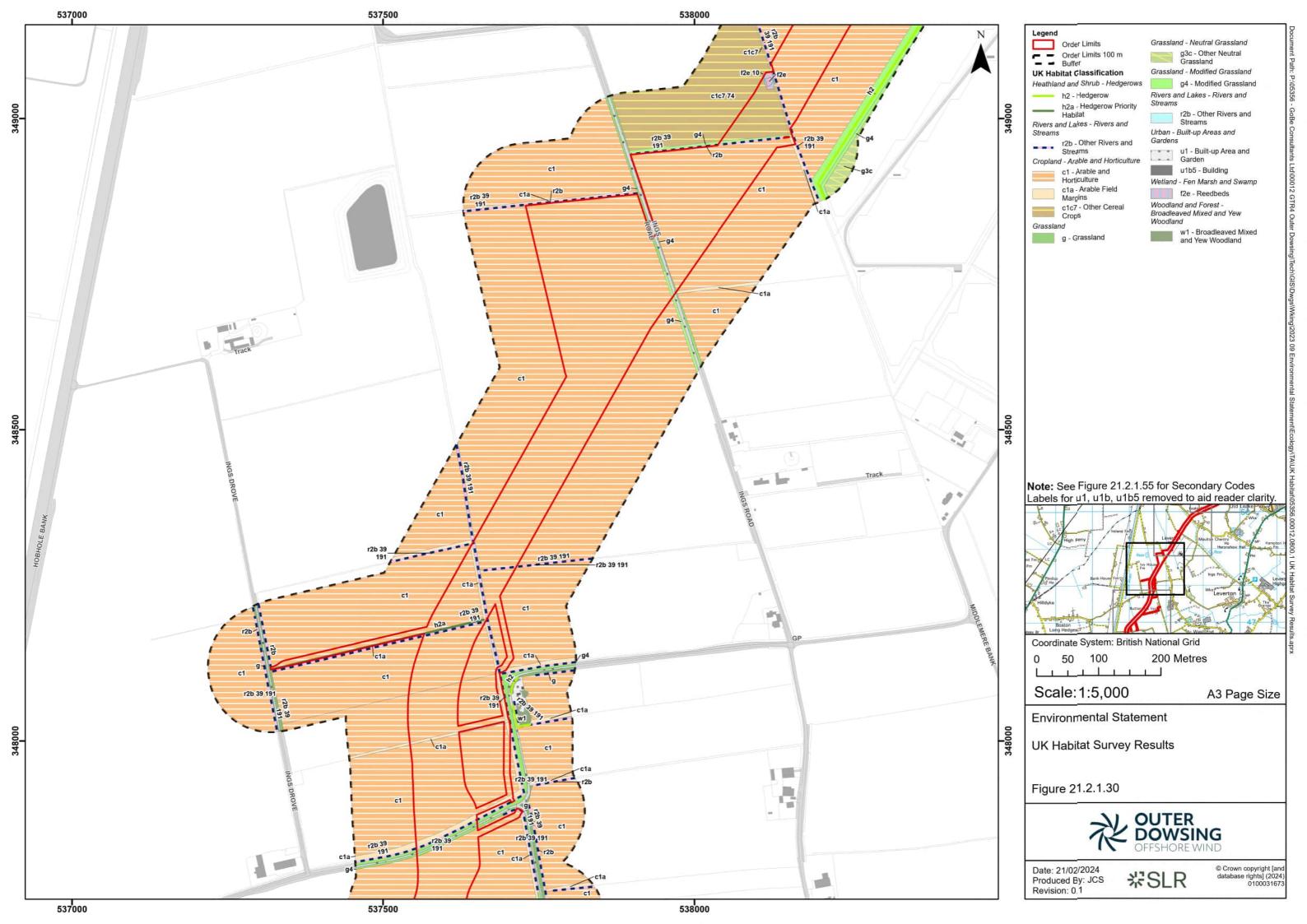


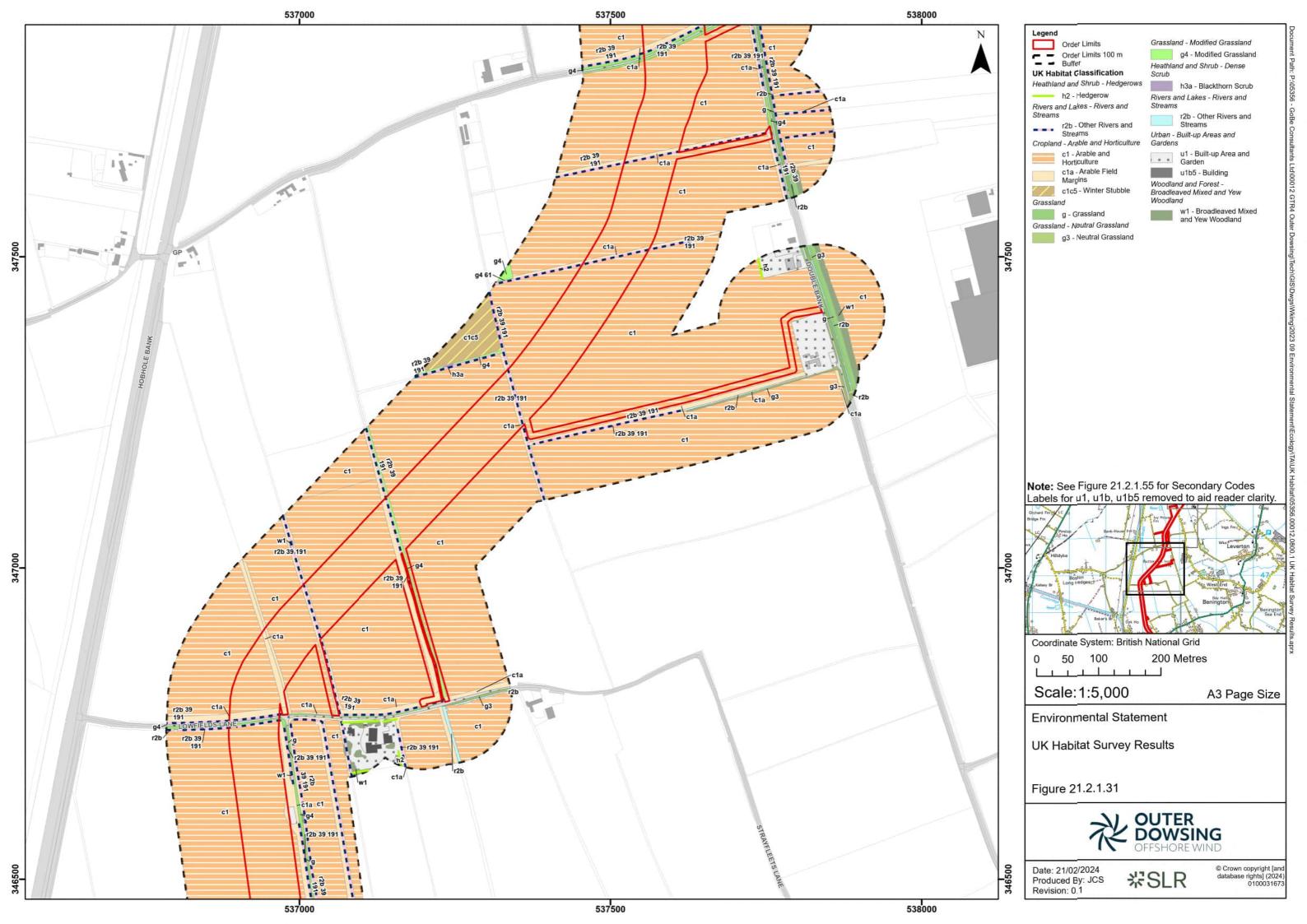


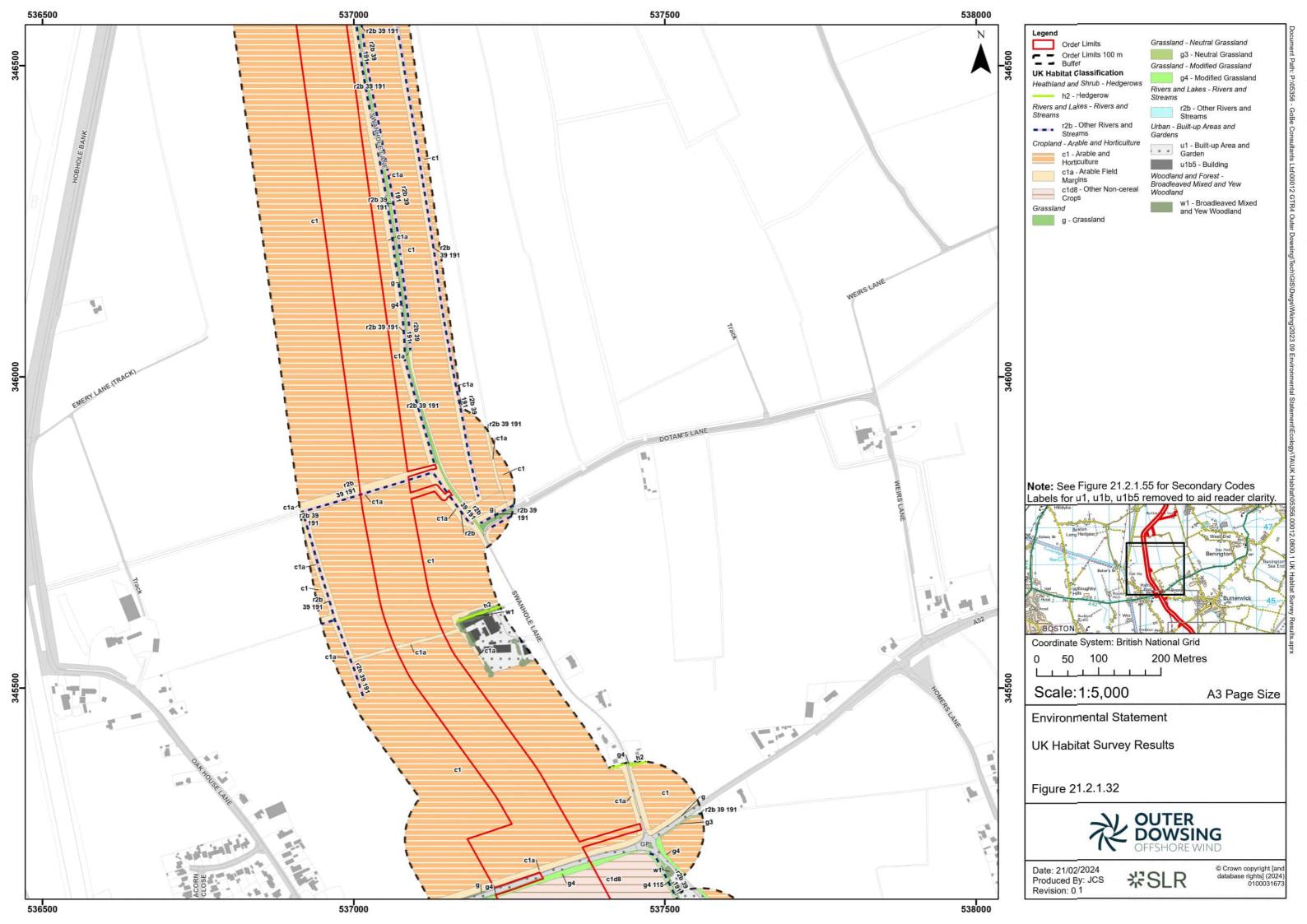


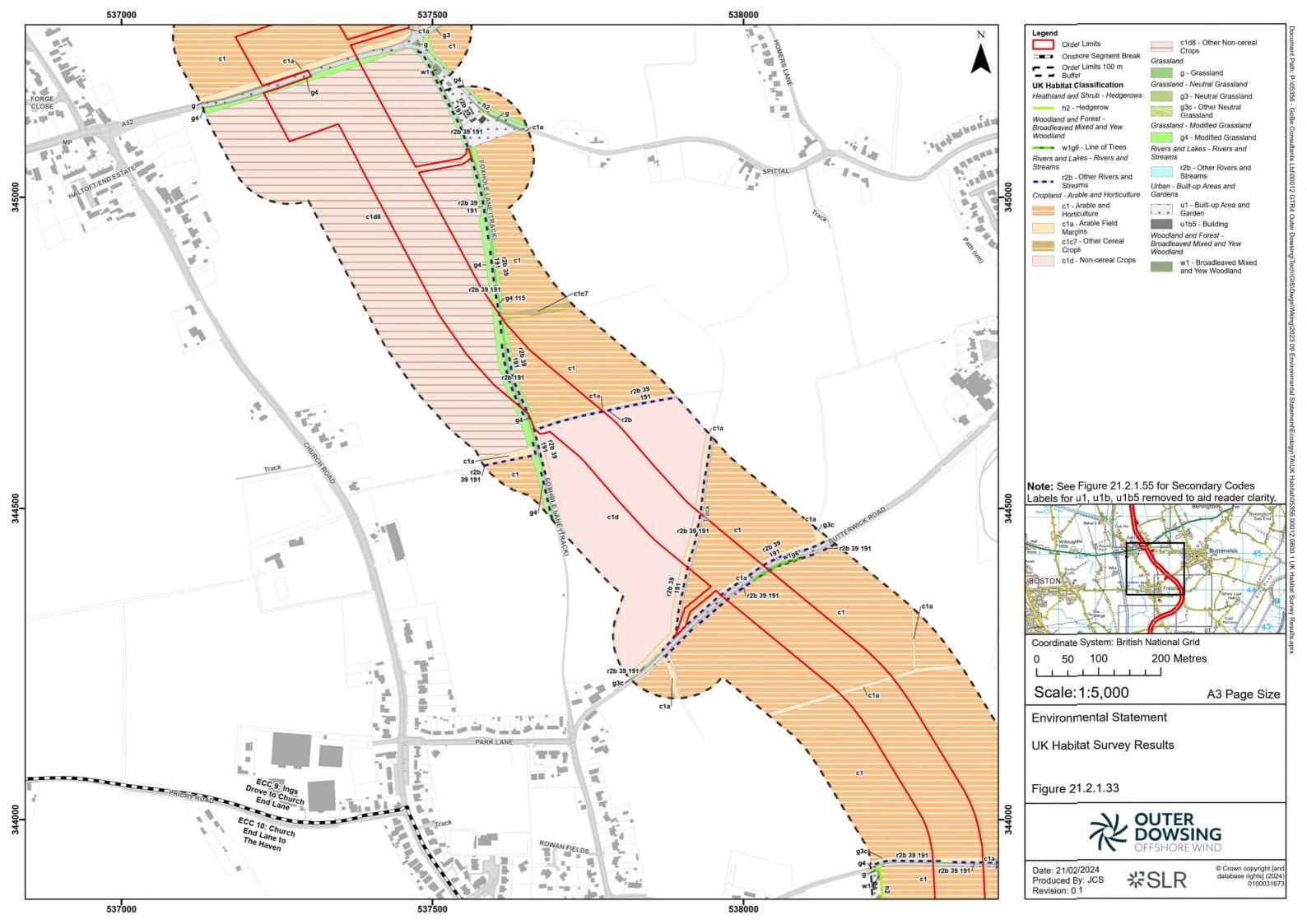


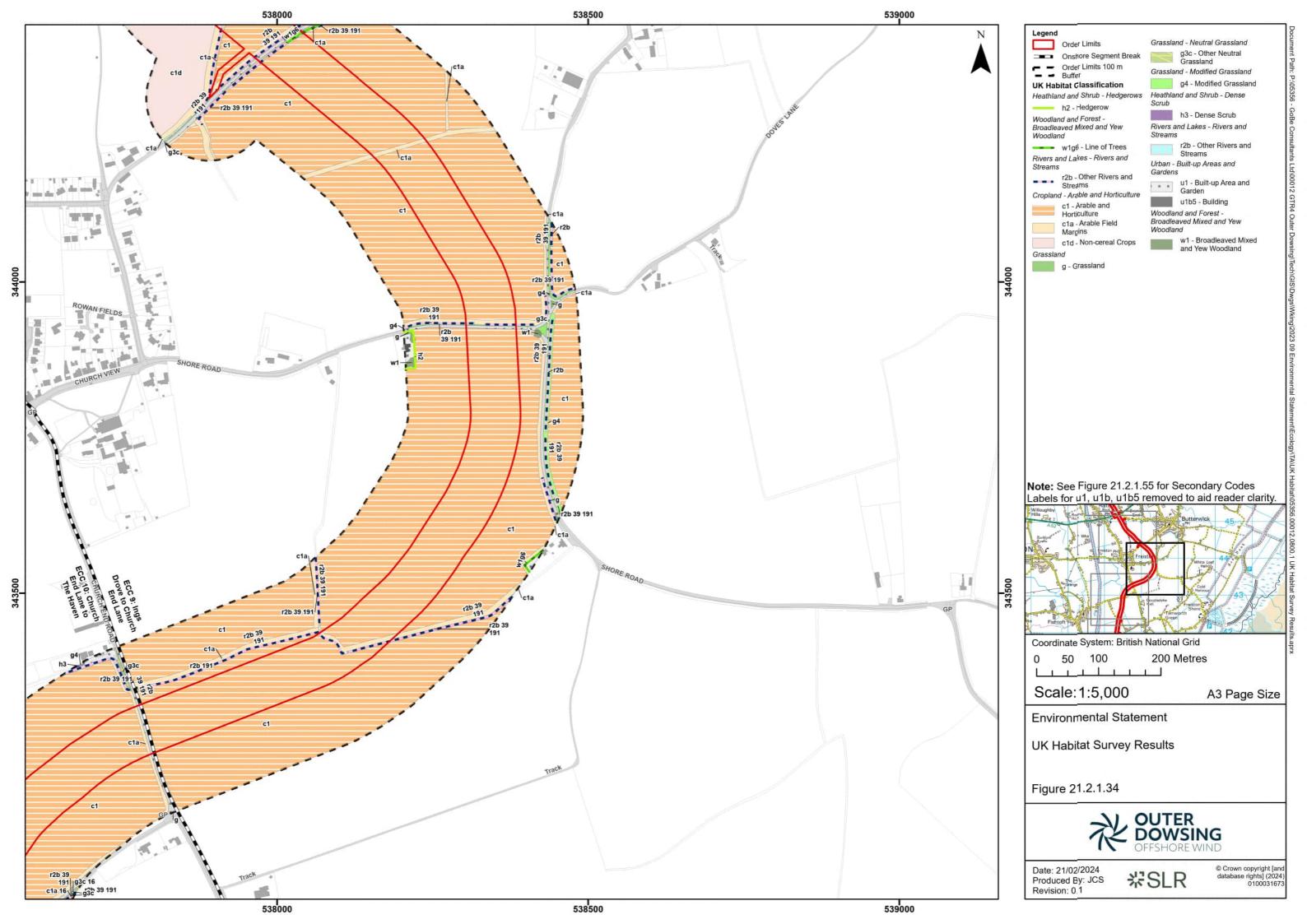


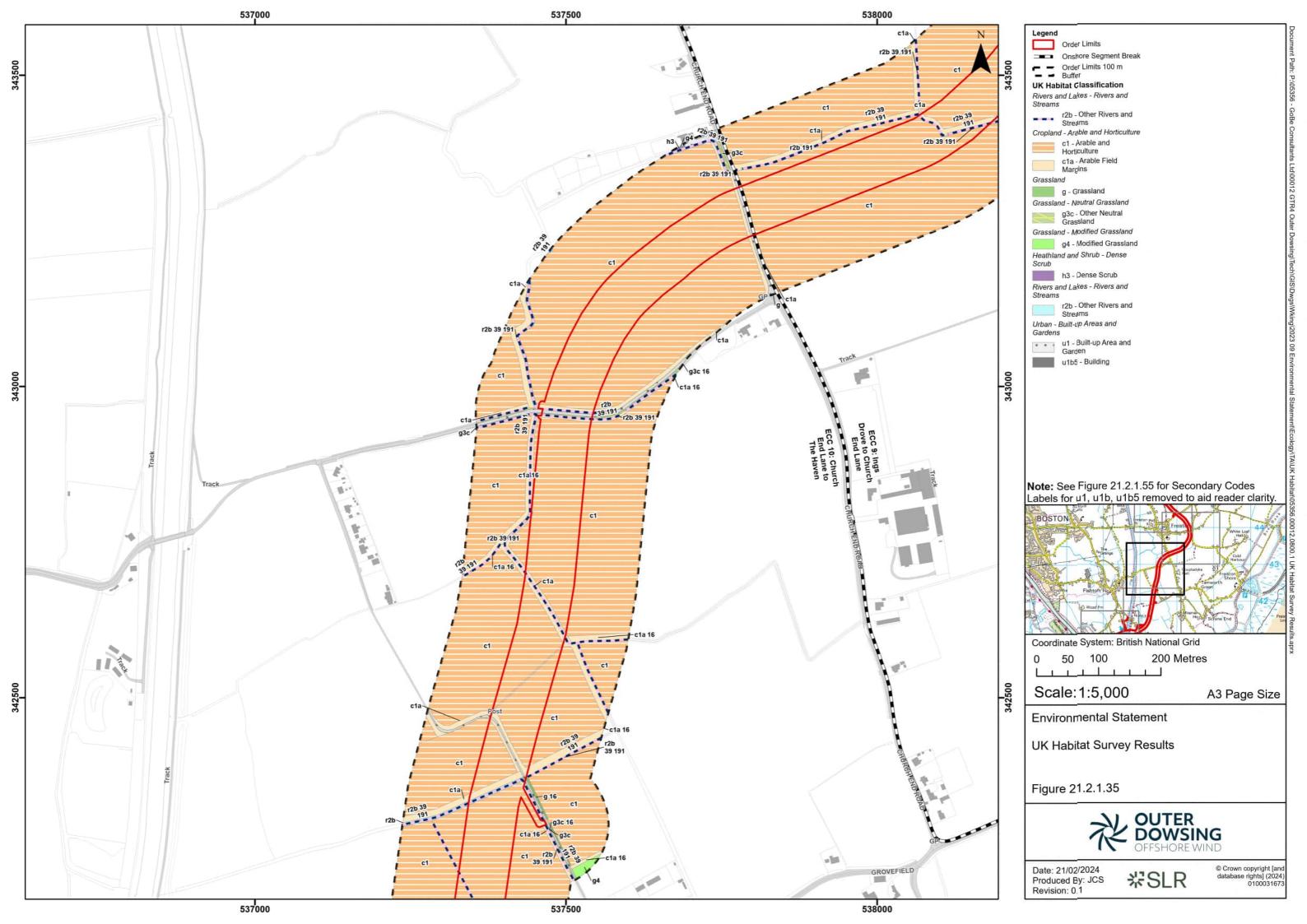


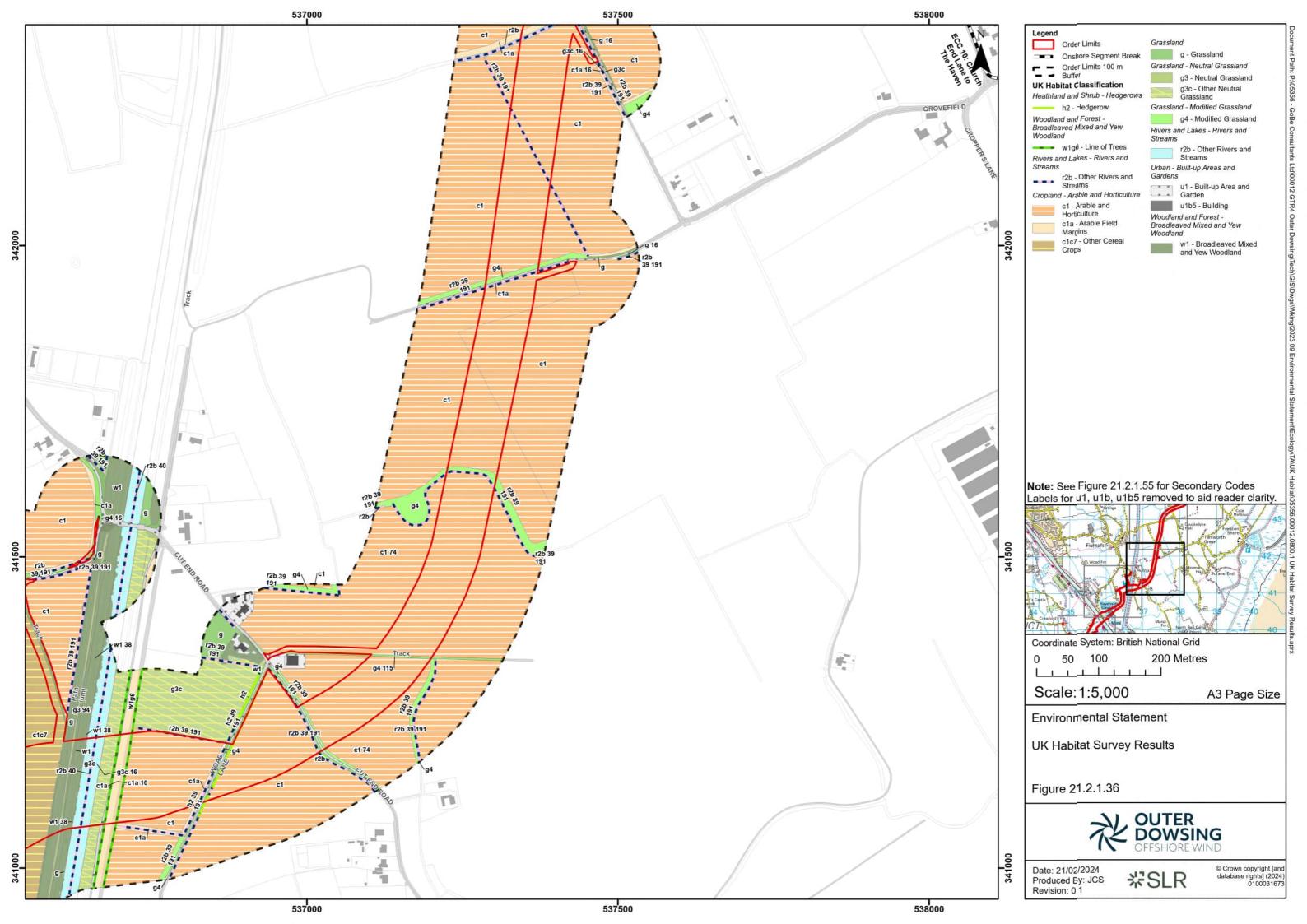


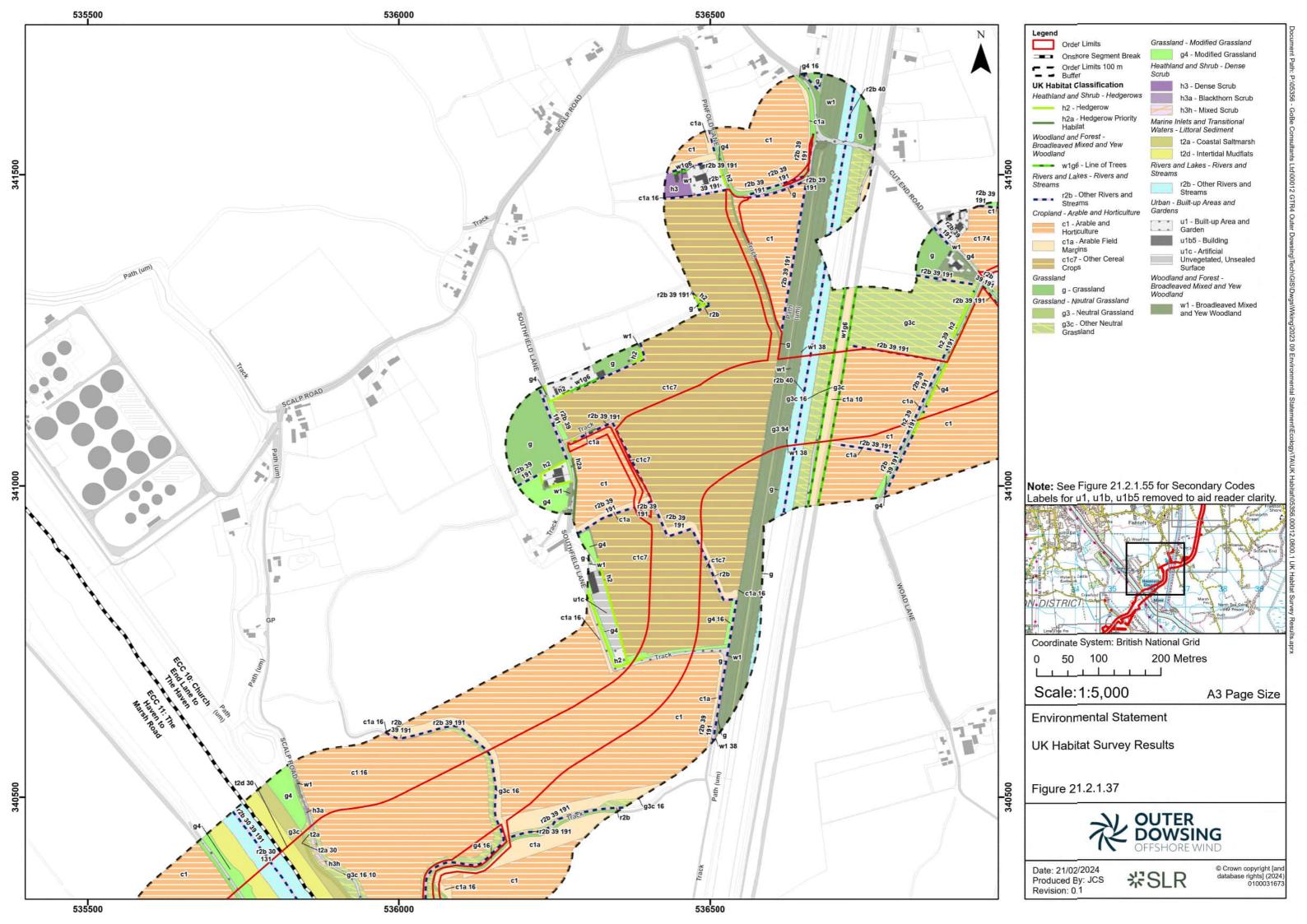


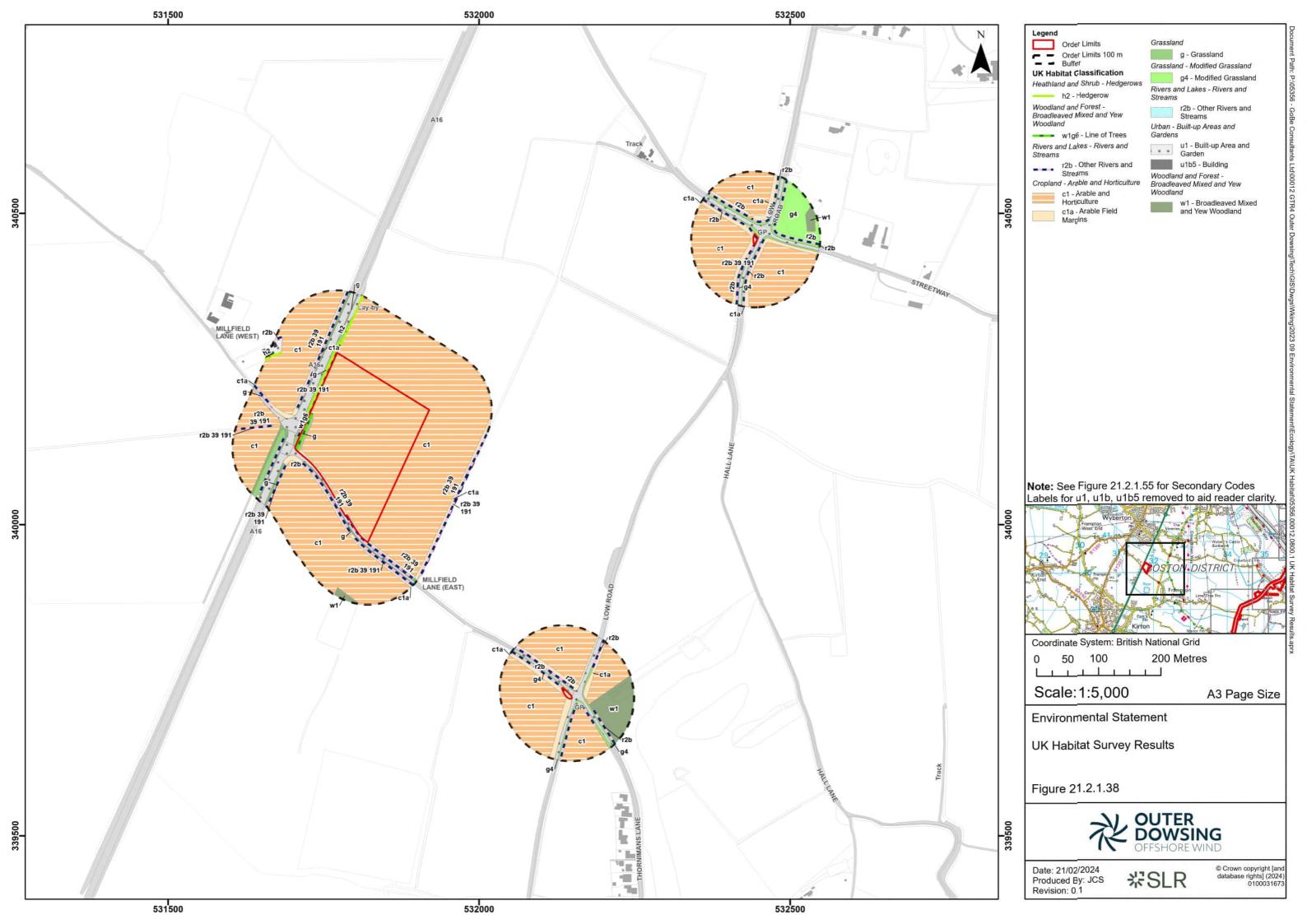


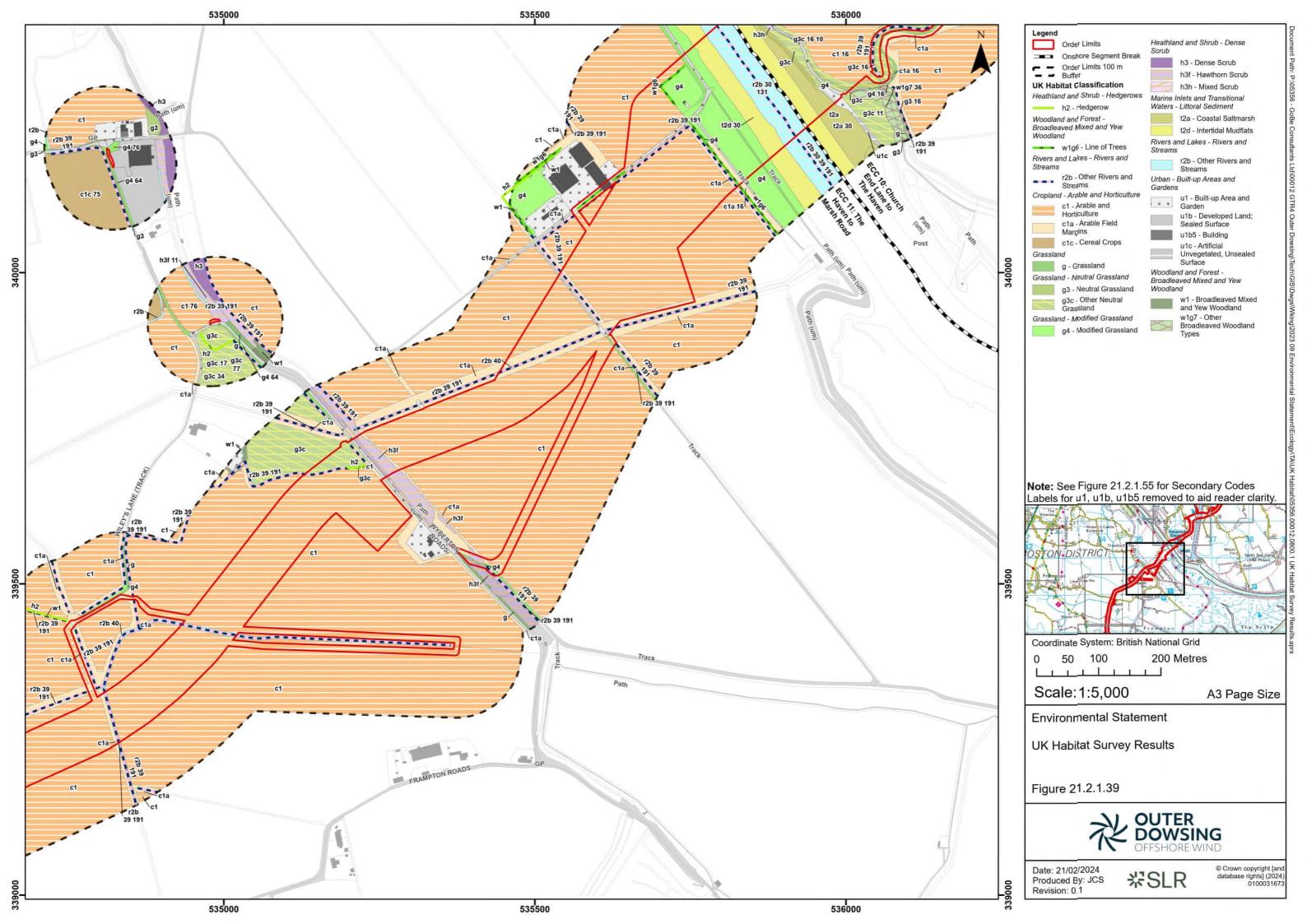


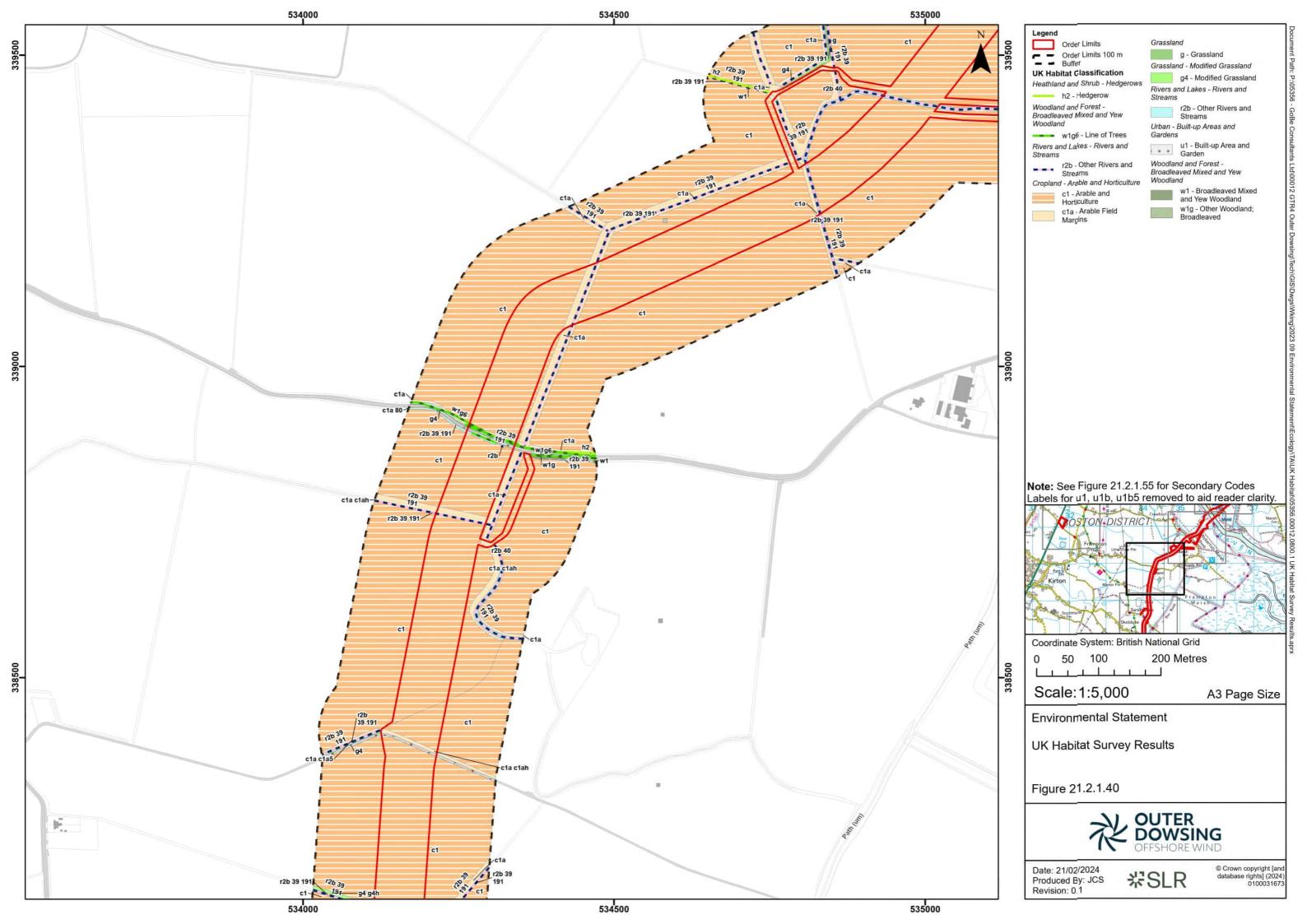


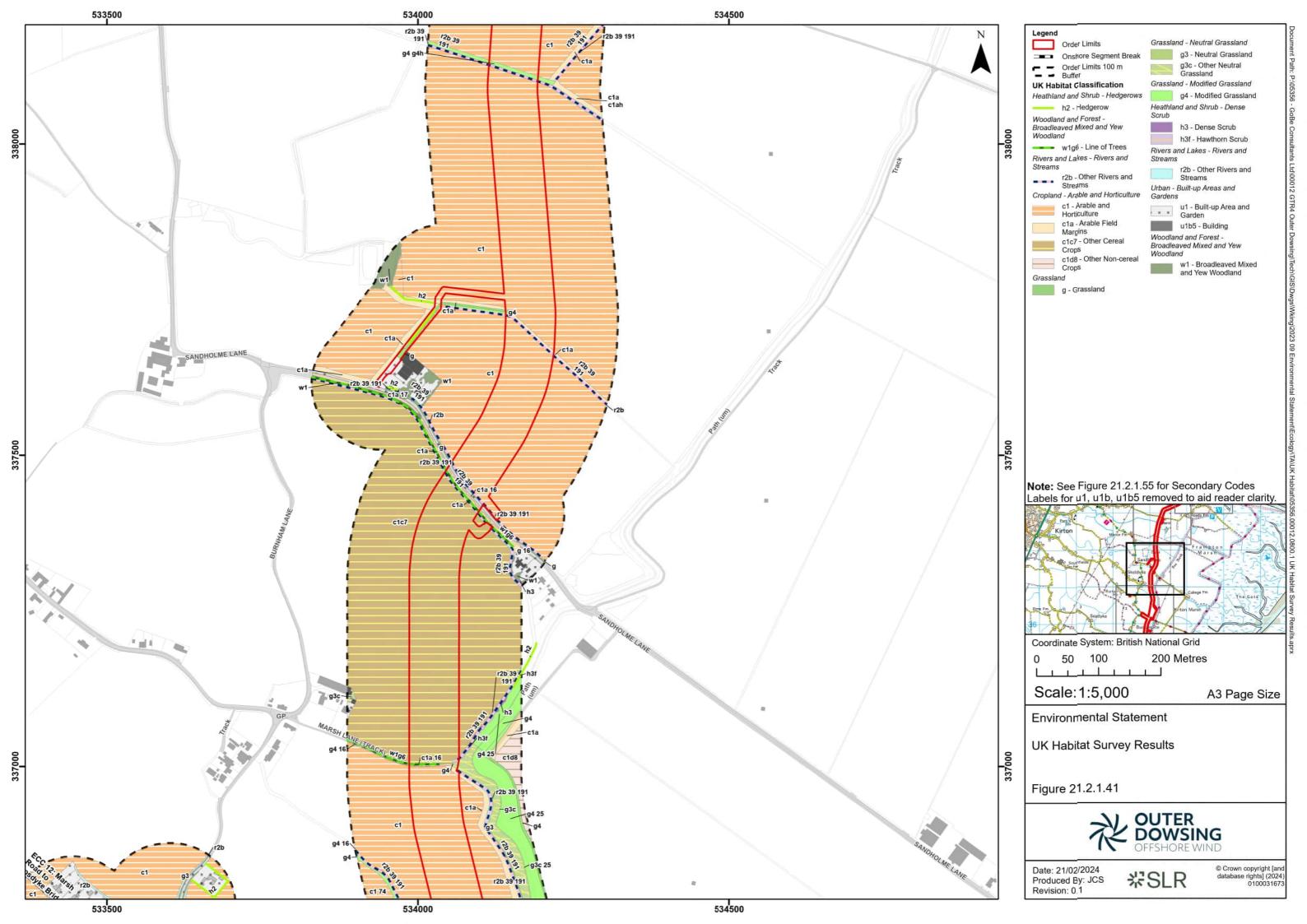


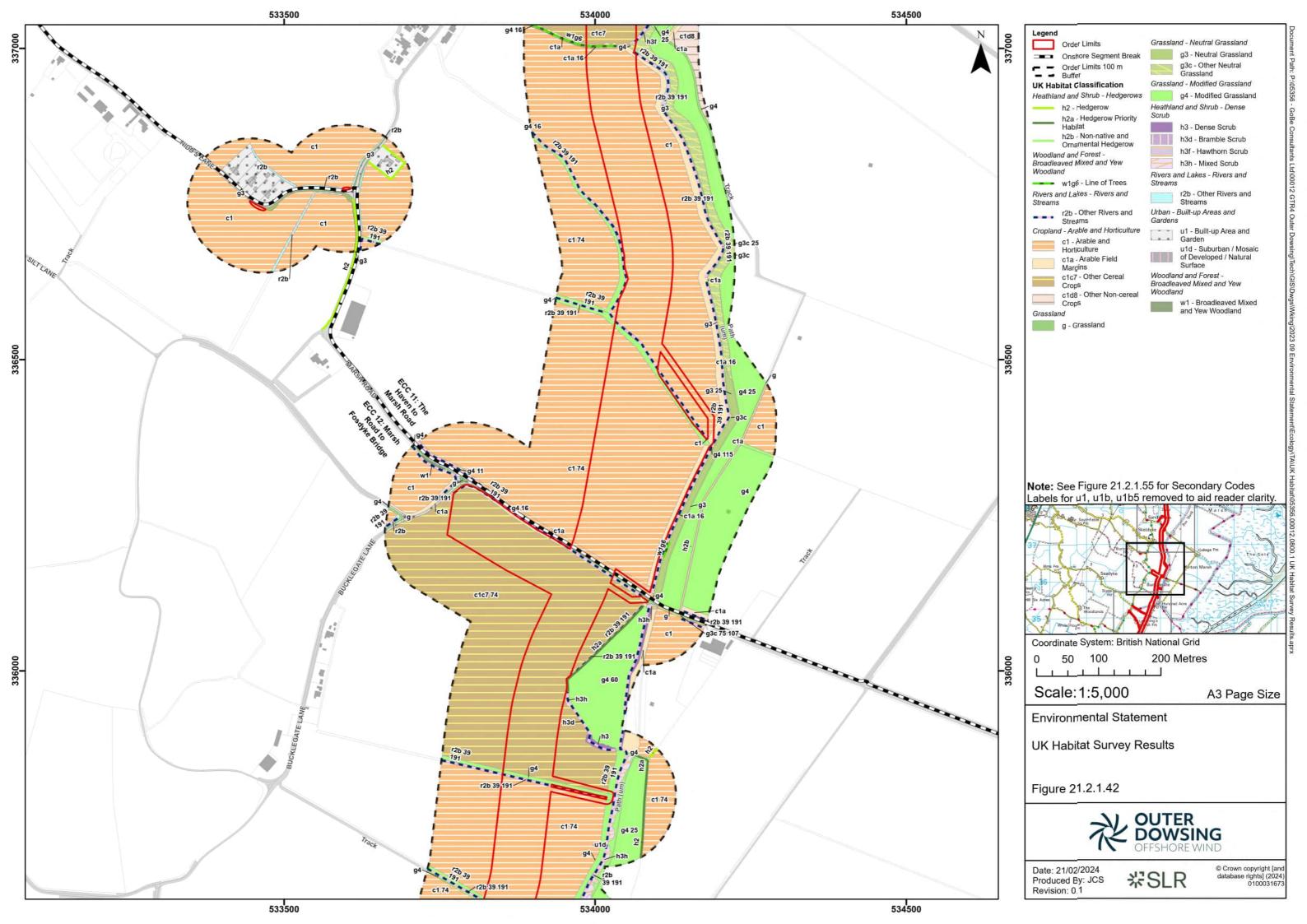


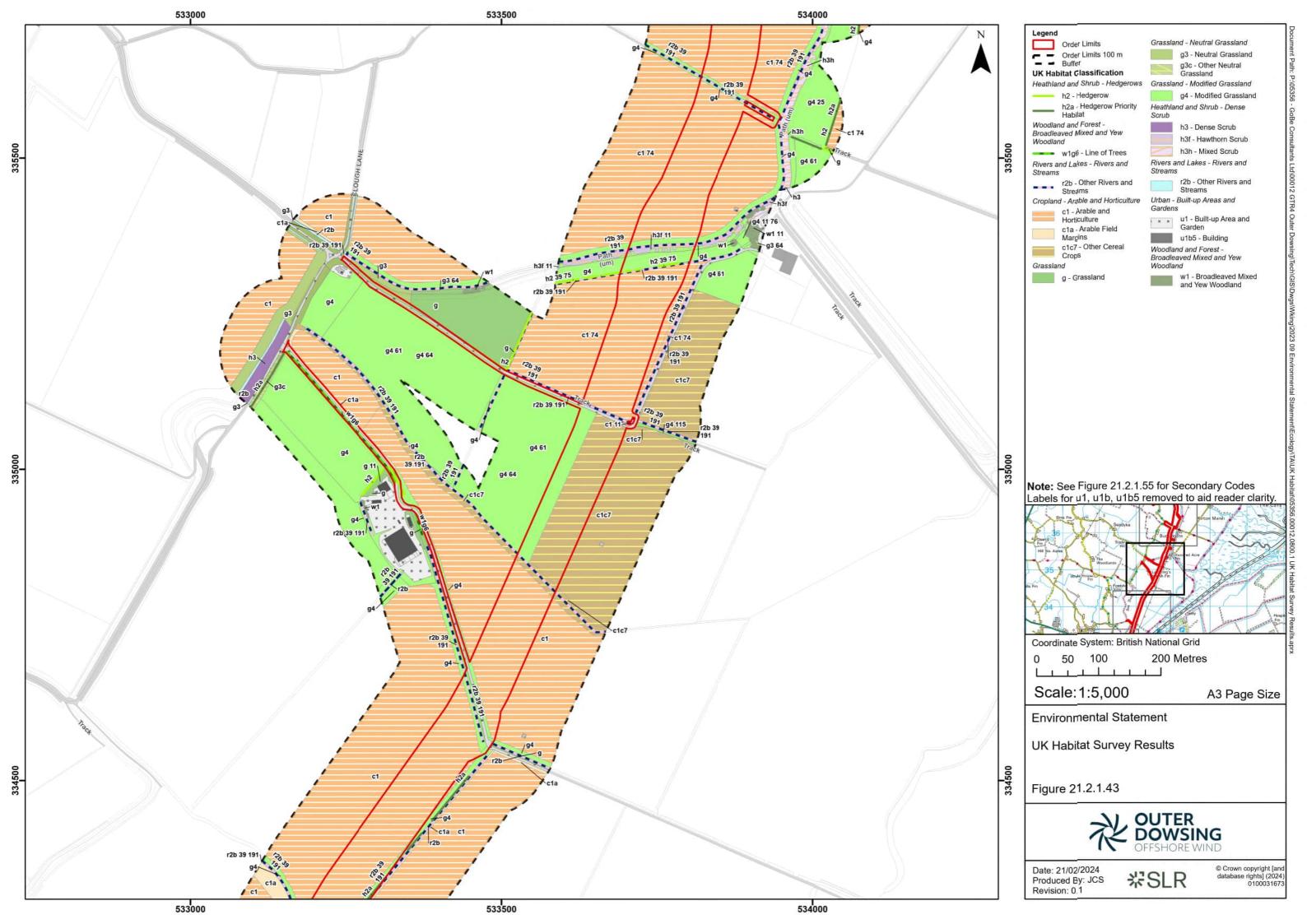


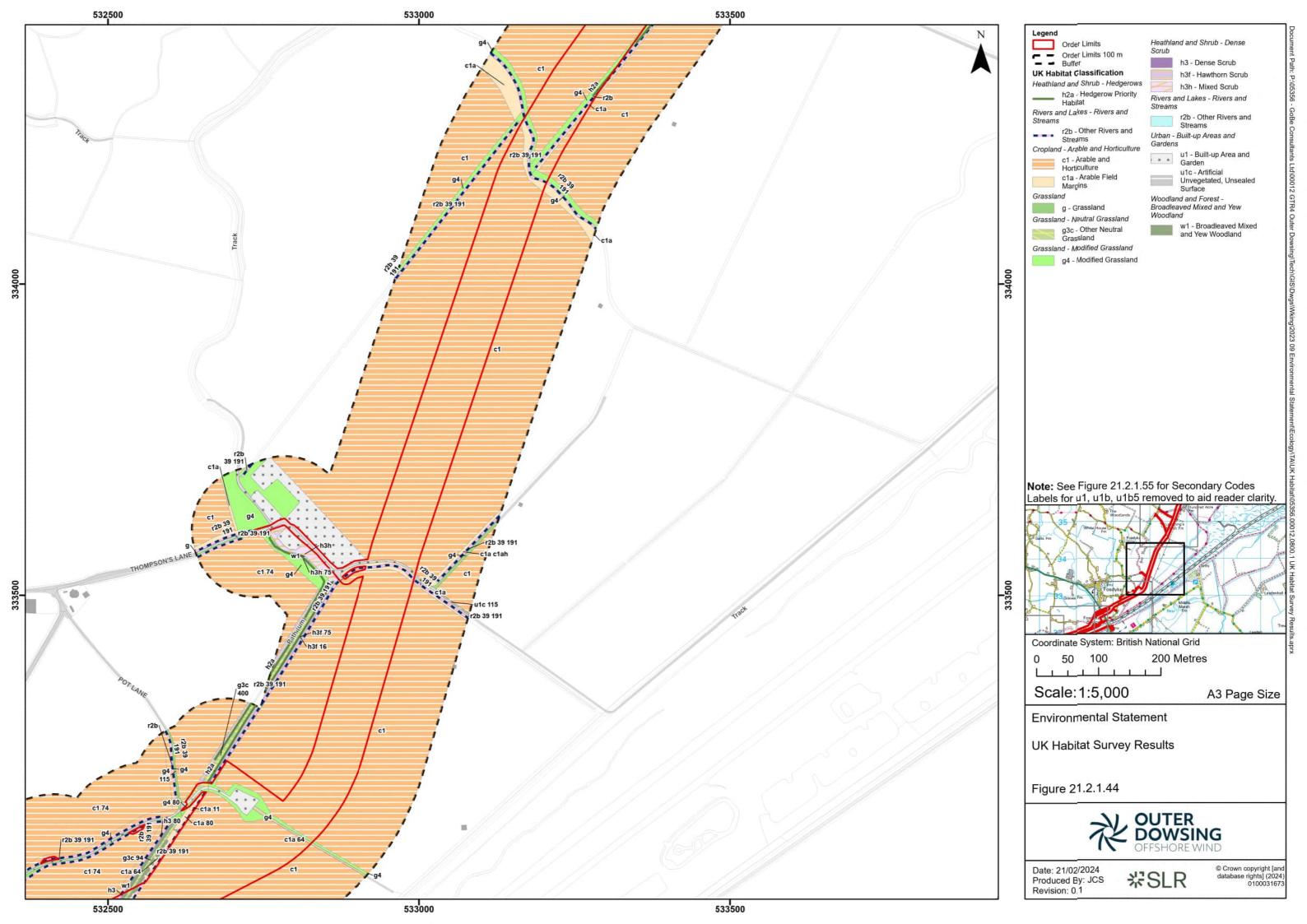


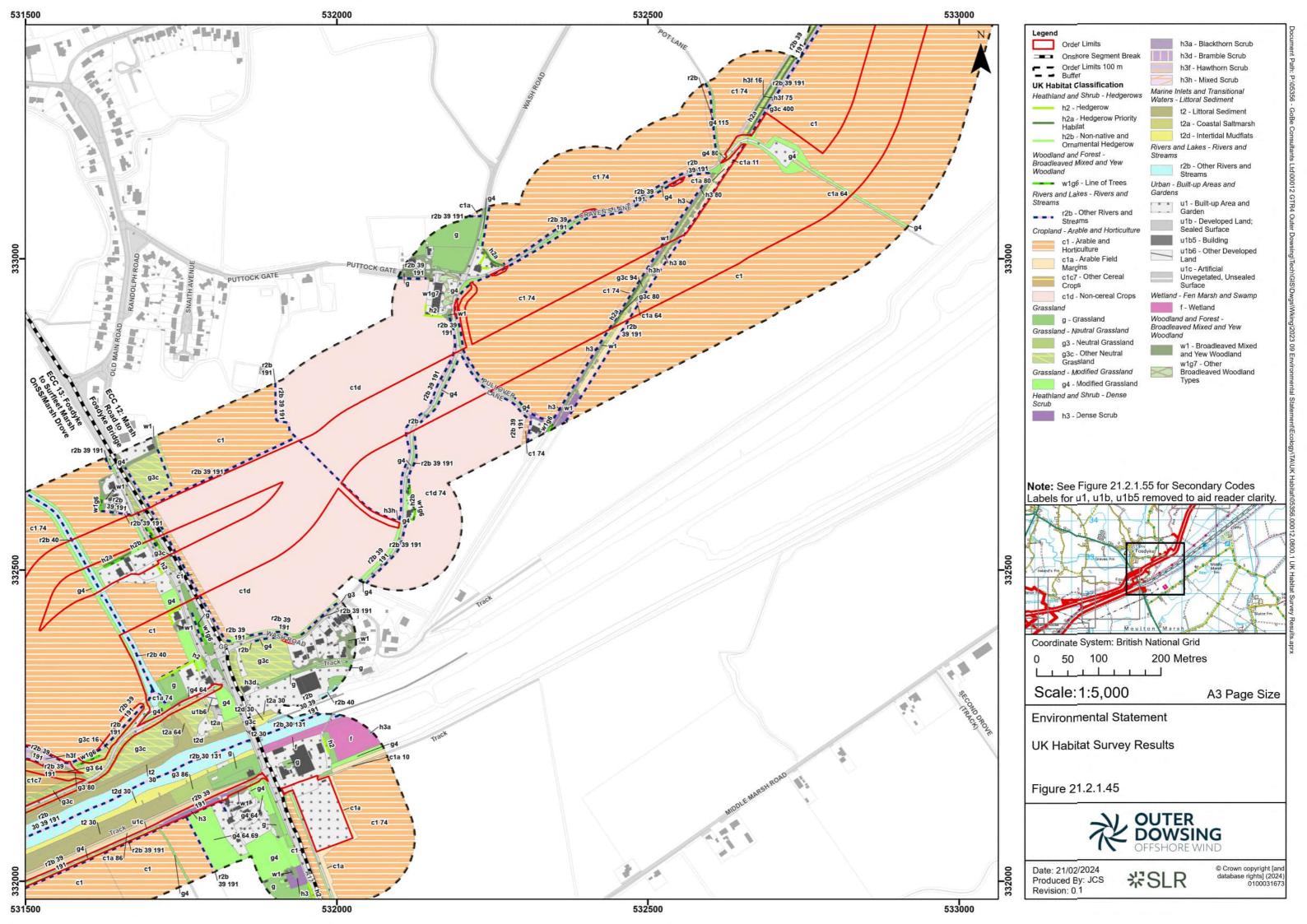


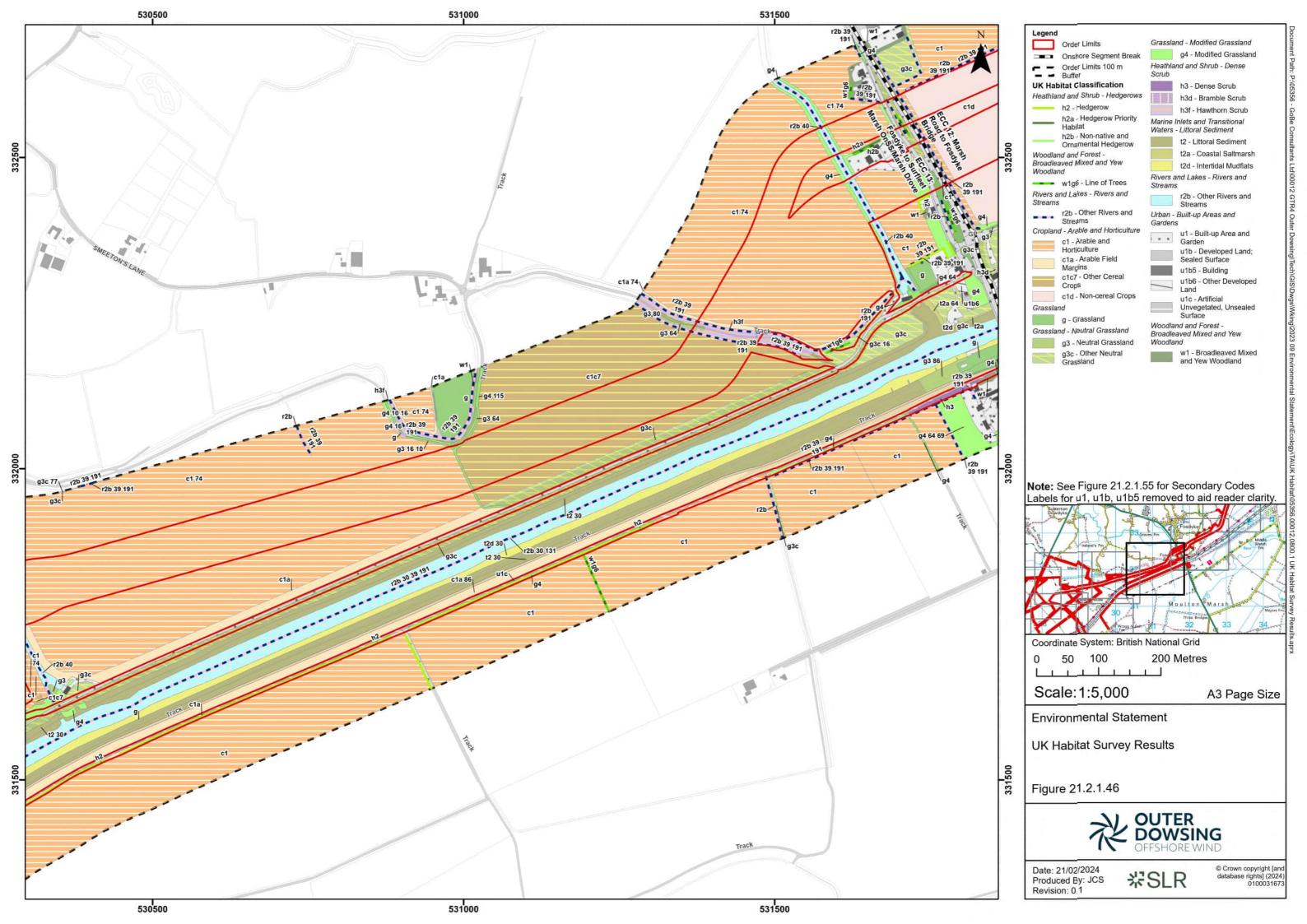


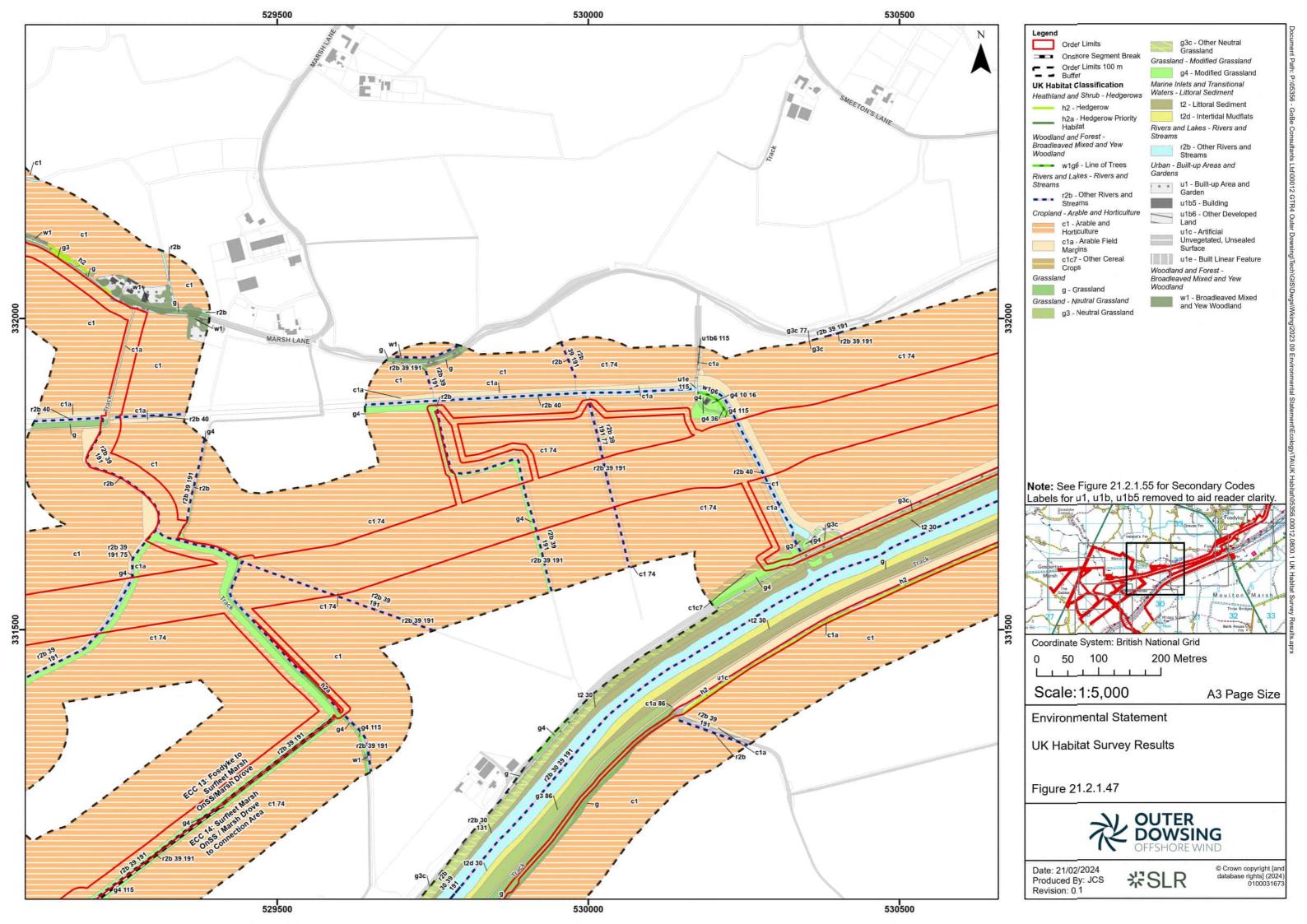


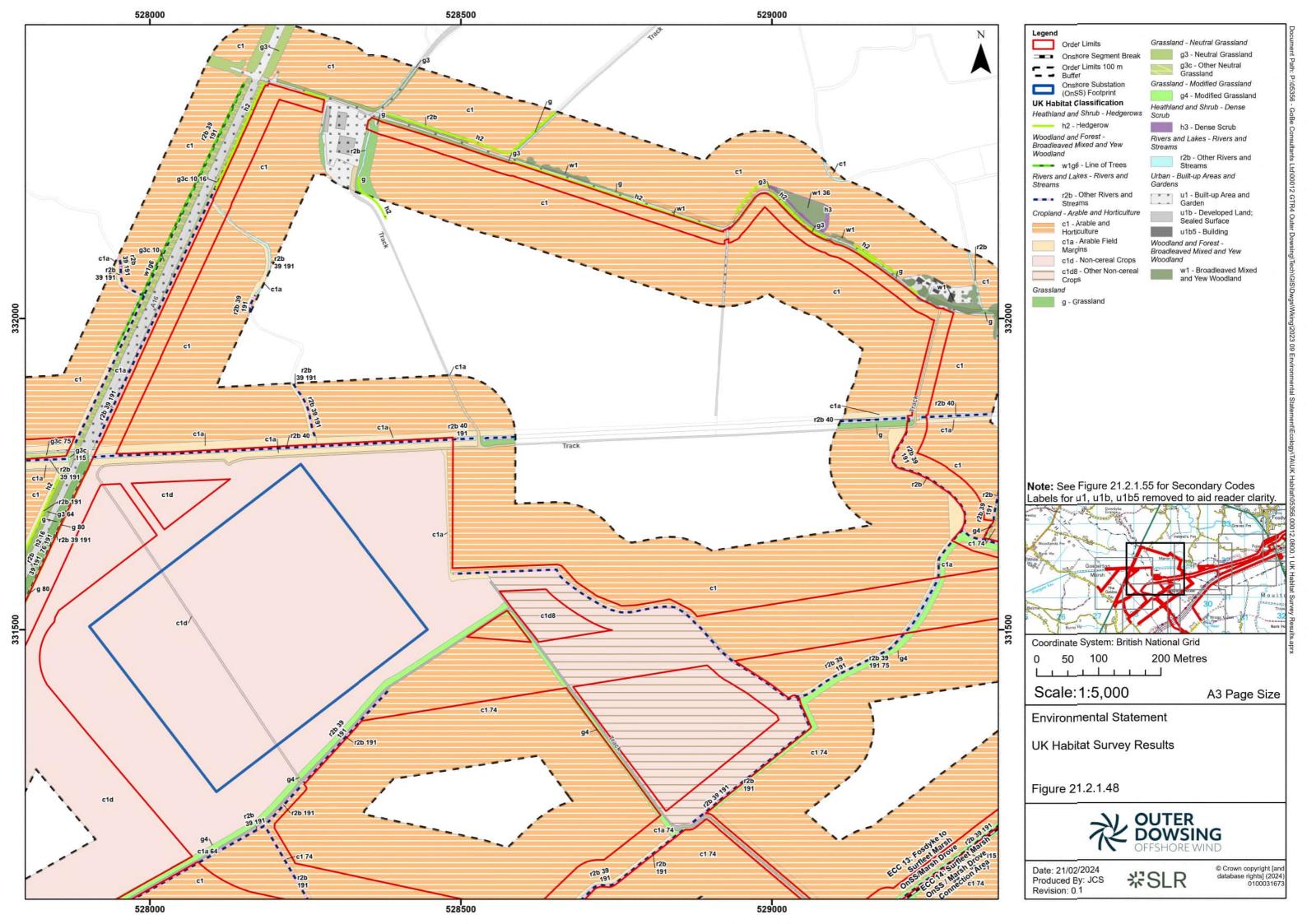


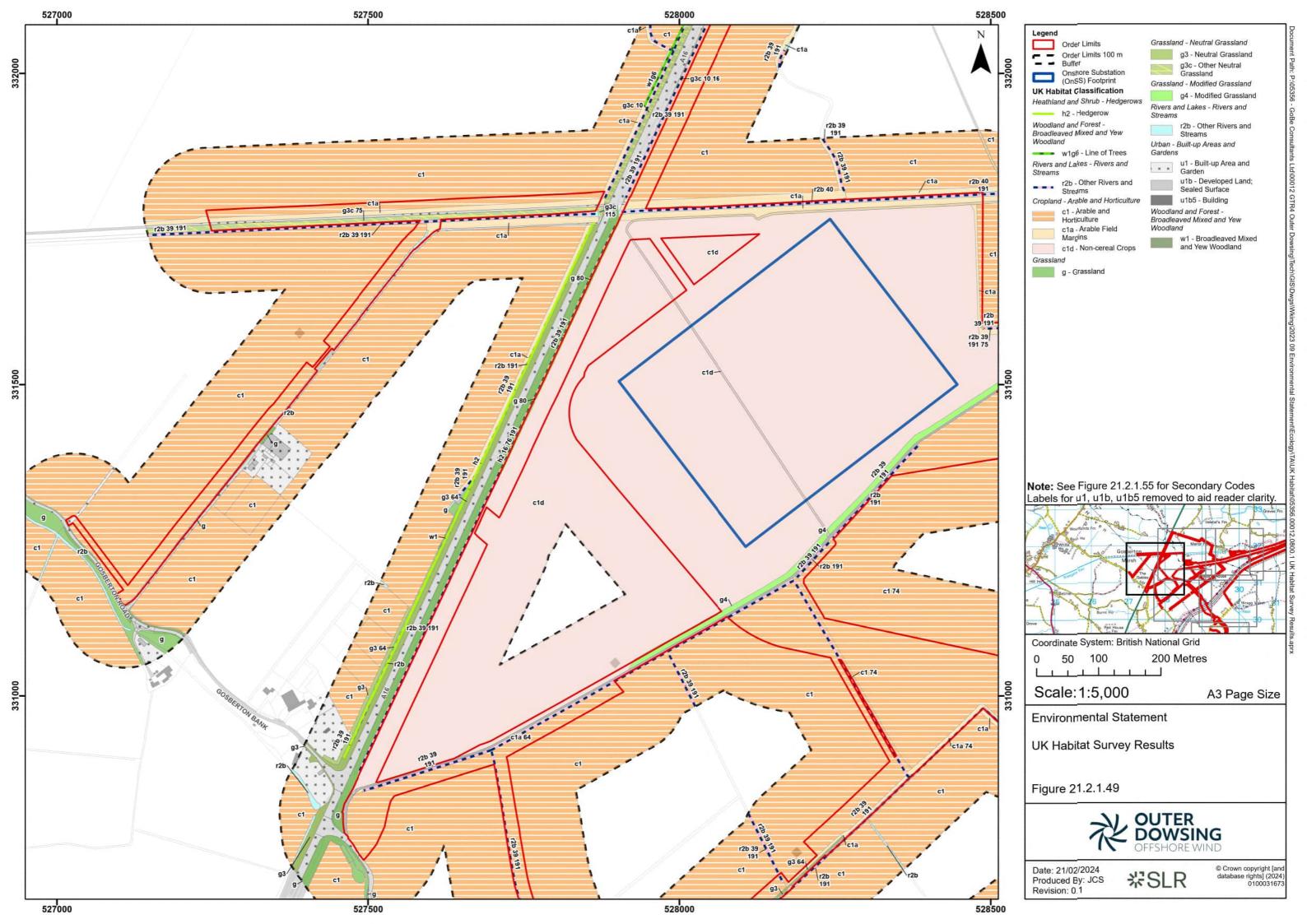


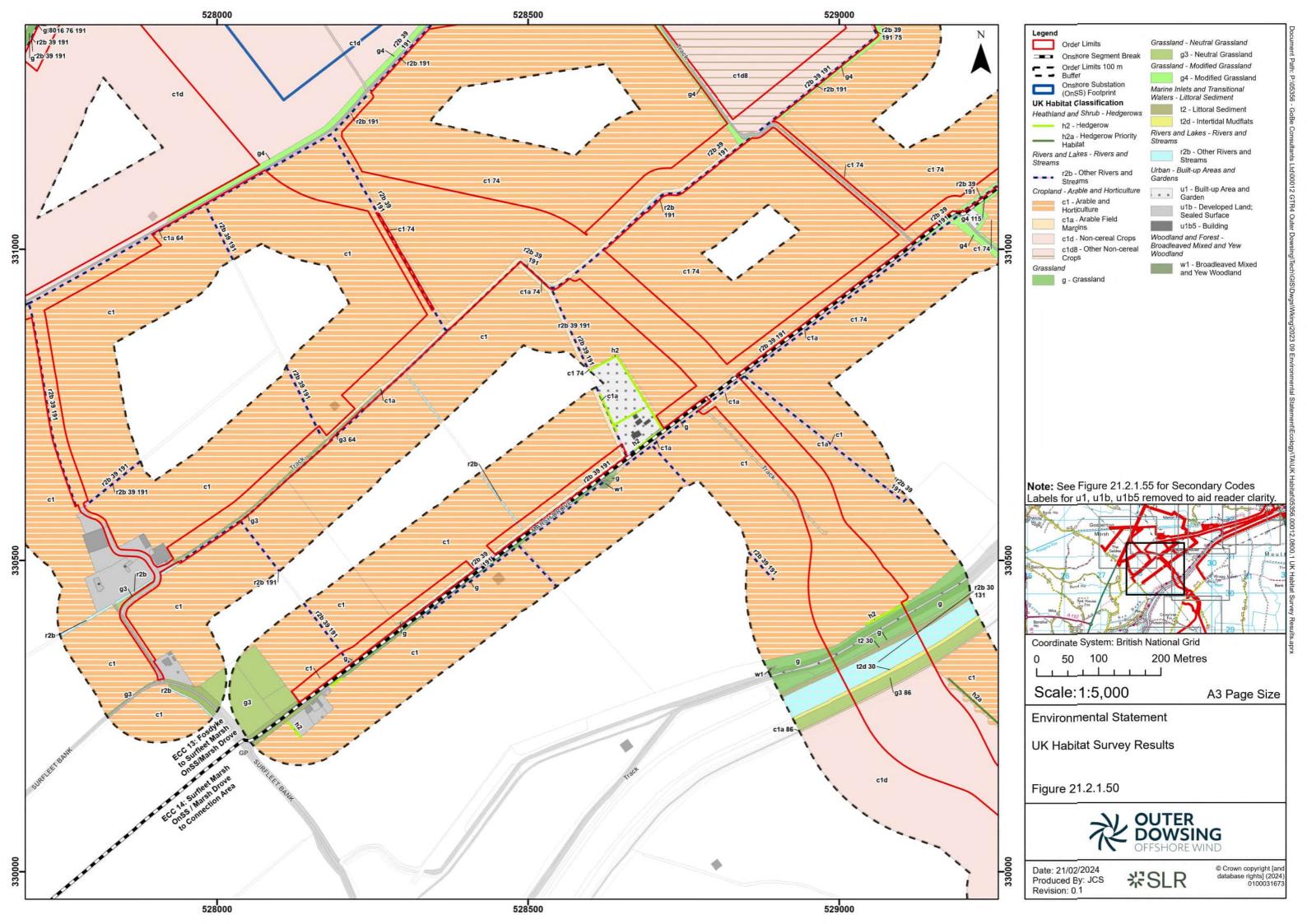


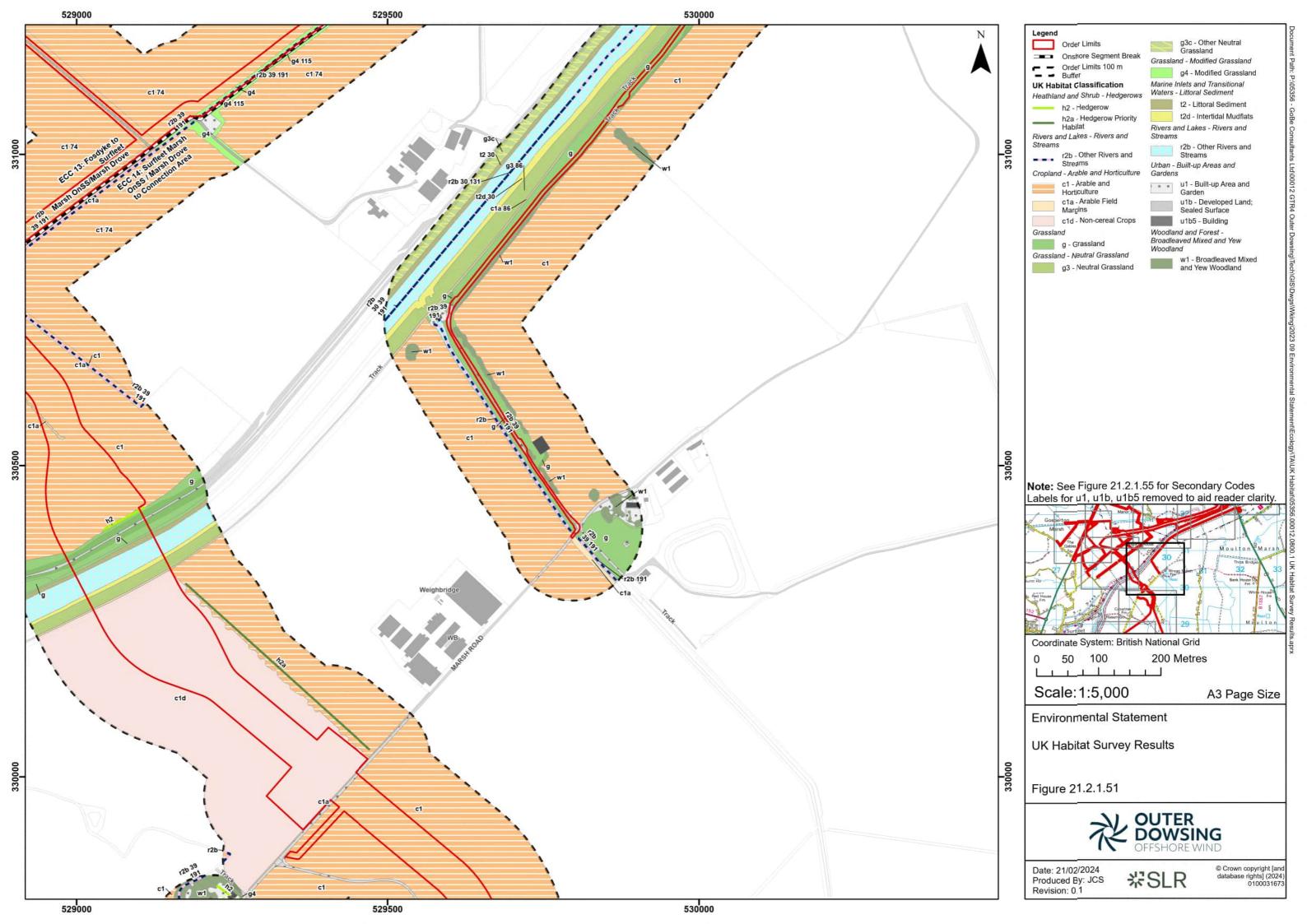


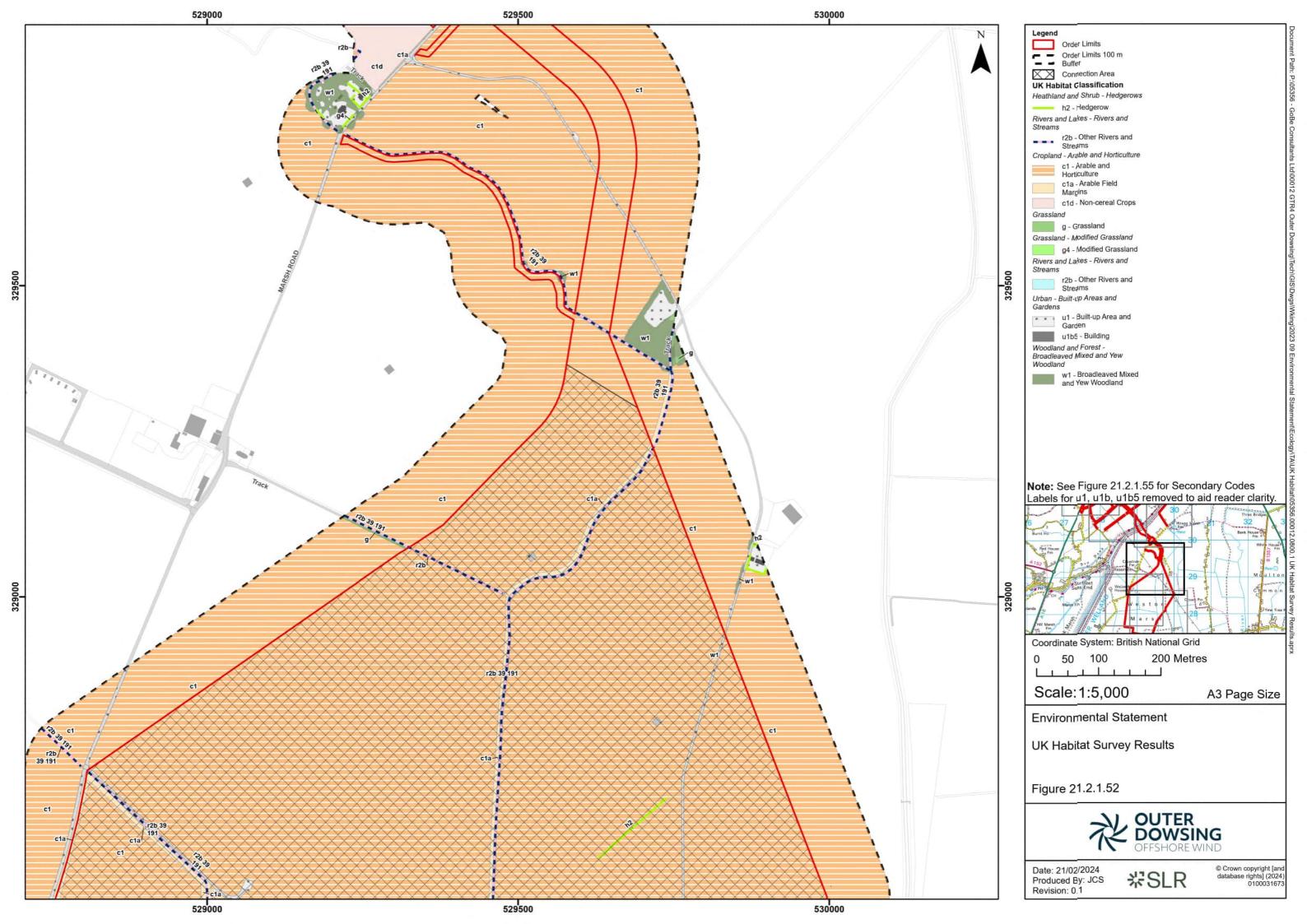


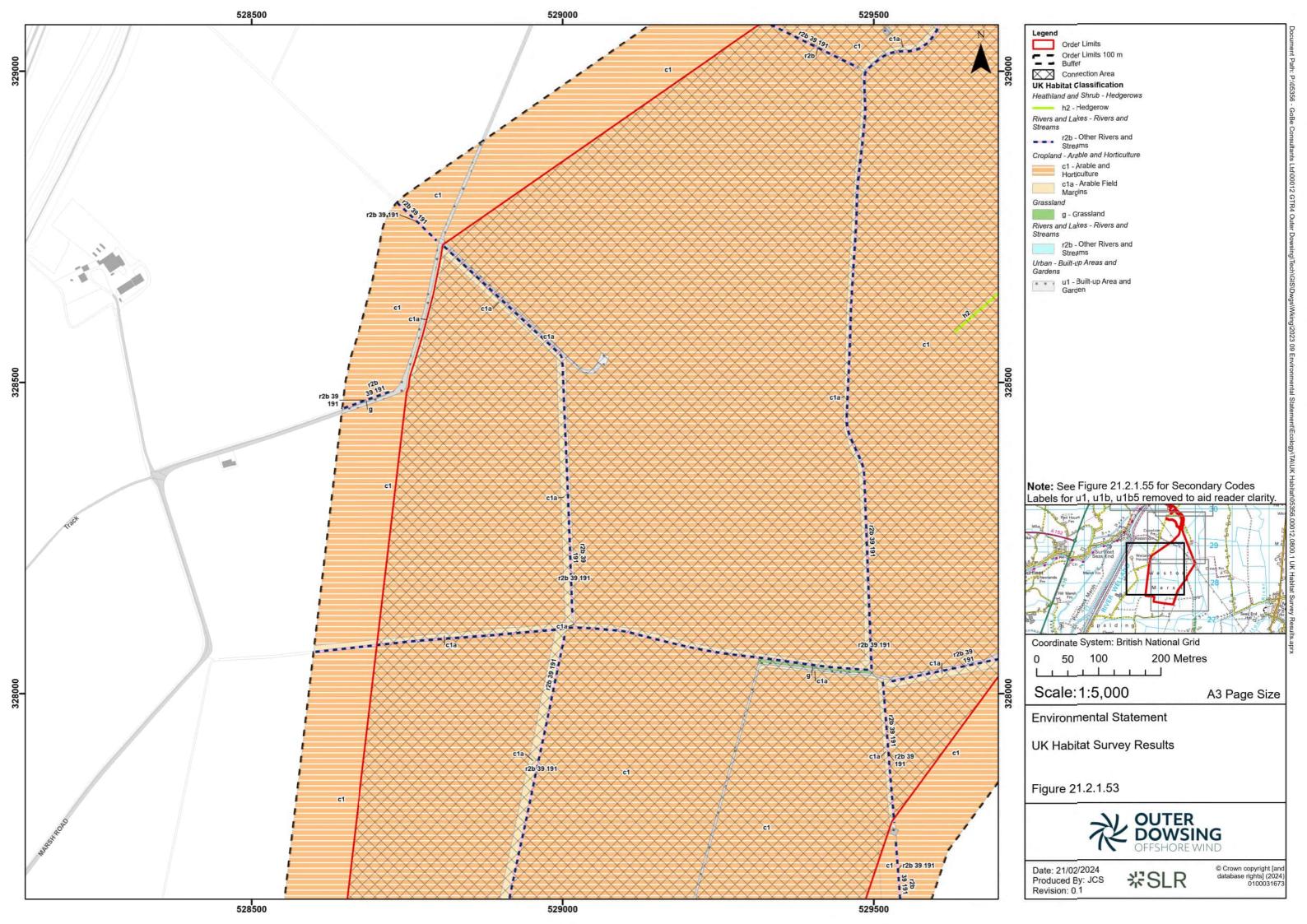


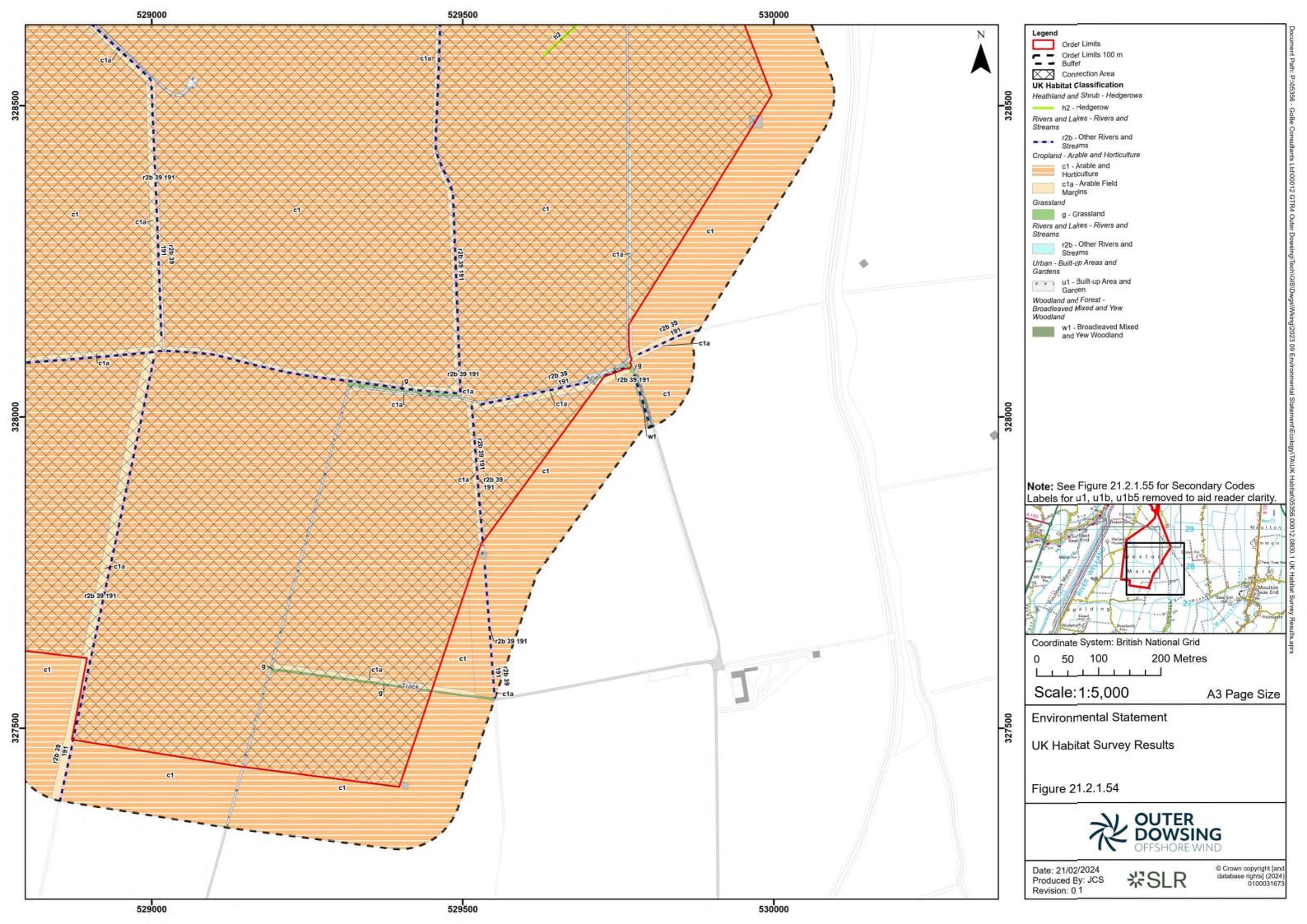












Secondary Codes

- **10** Scattered scrub
- 11 Scattered trees
- 14 Scattered rushes
- 16 -Tall herb
- 17 Ruderal/ ephemeral
- **19** Ponds (Priority Habitat)
- 25 Coastal and floodplain grazing marsh
- **30** Estuaries (H1130)
- 34 Arable reversion grassland
- **36** Plantation
- 38 Secondary woodland
- **39** Freshwater man-made
- 40 Freshwater heavily modified
- 41 Freshwater natural
- **47** Native
- **53** Felled
- 58 Grazed
- 59 Cattle grazed
- 60 Sheep grazed
- 61 Horse grazed
- **64** Mown
- **69** Fence
- 70 Hedgebank
- 73 Bare ground

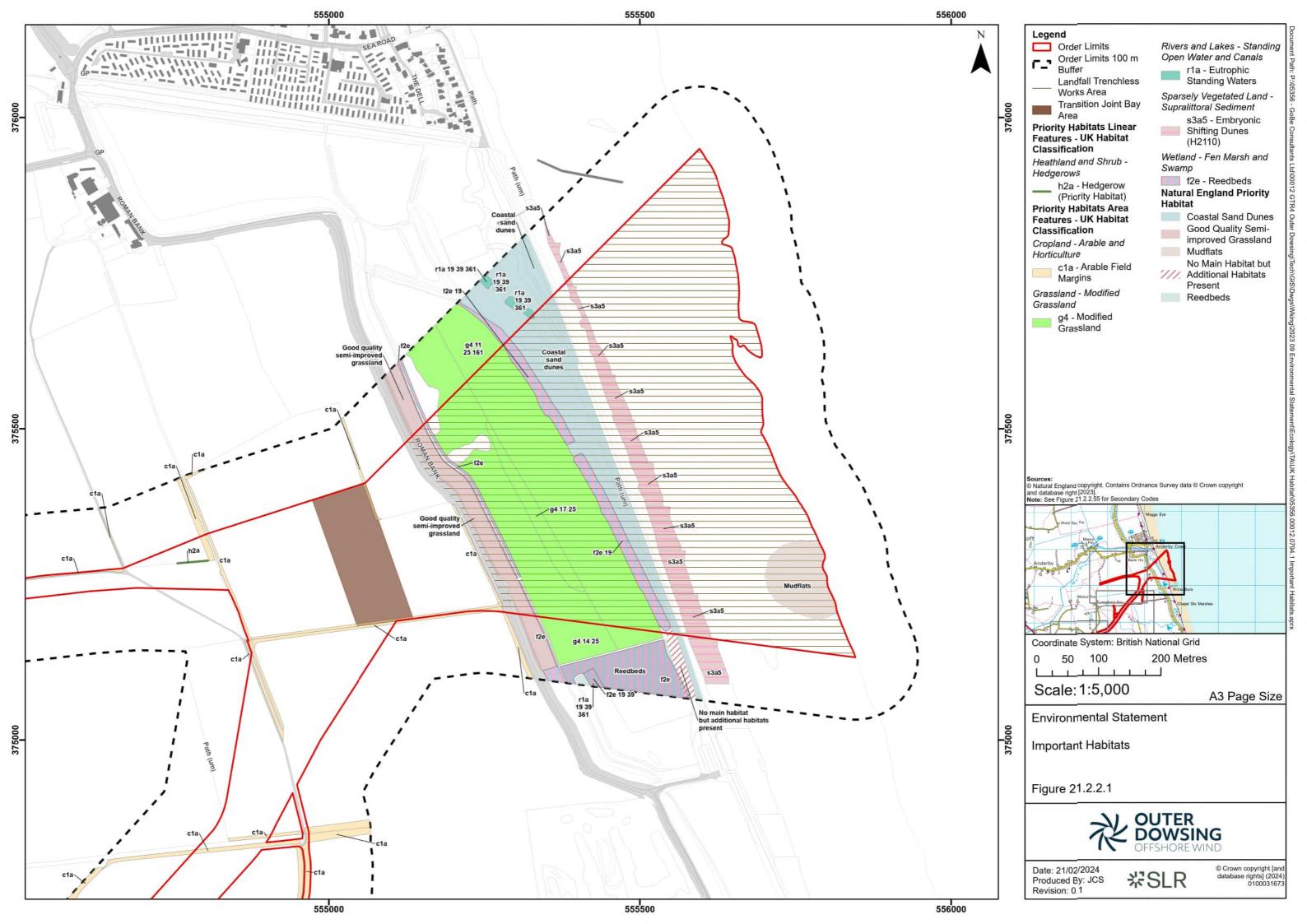
- 74 Ploughed
- 75 Active Management
- 76 Recent Management
- 77 Neglected
- 78 Abandoned
- 80 Unmanaged
- 86 Accessible natural greenspace
- 88 Barn
- **107** Railway
- **111** Road
- **114** Solar panel array
- **115** Track
- 131 Tidal river
- 133 Nutrient-enriched substrate
- **161** Tall or tussocky sward
- 162 Temporary water bodies
- 190 Hedgerow with trees
- 191 Ditch
- 361 Natural lake or pond
- 362 Artificial lake or pond
- 400 Green corridors
- 411 Natural watercourse
- **431** Road island/verge
- **920** Orchard

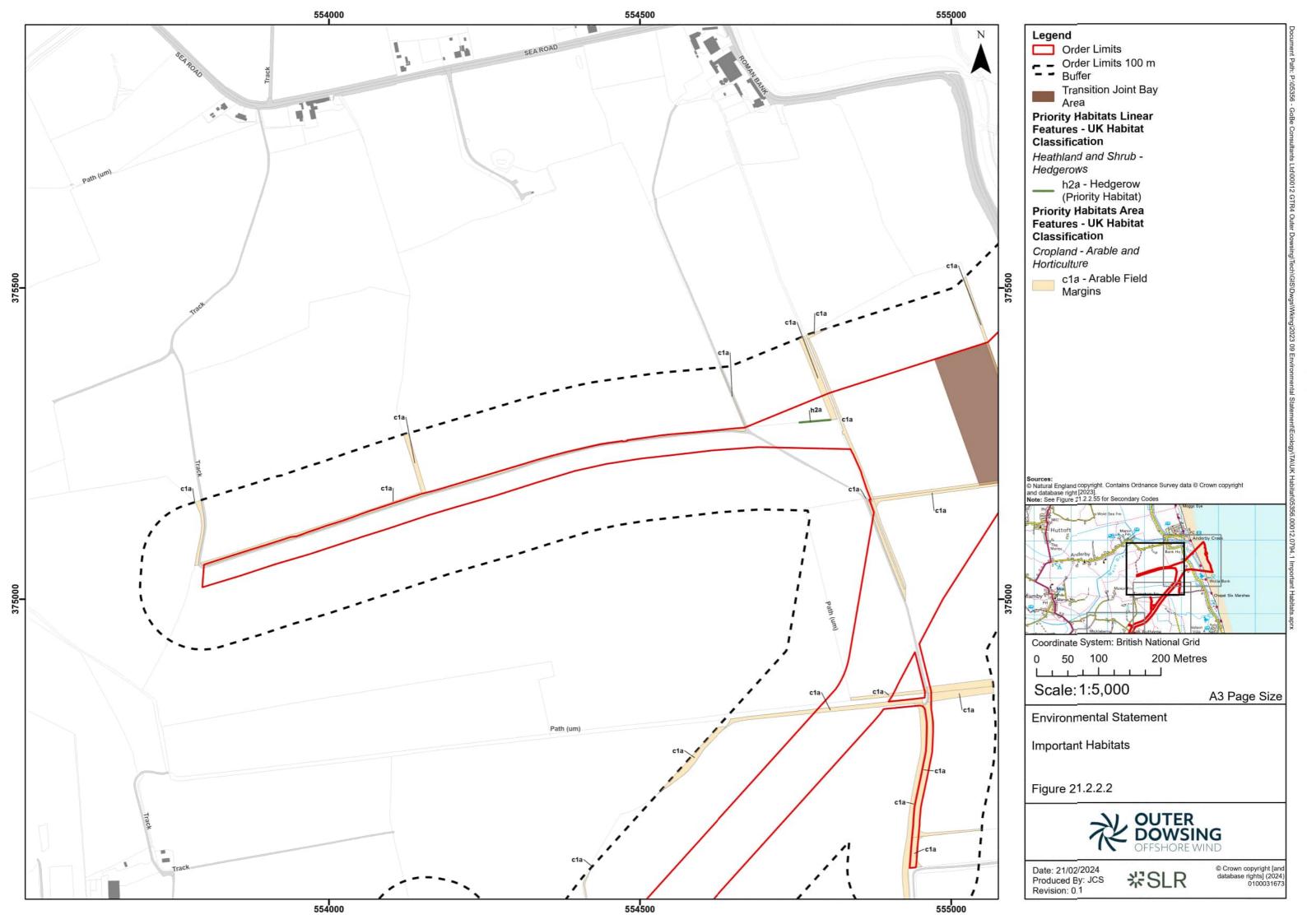
Environmental Statement UK Habitat Survey Results Figure 21.2.1.55 OUTER DOWSING

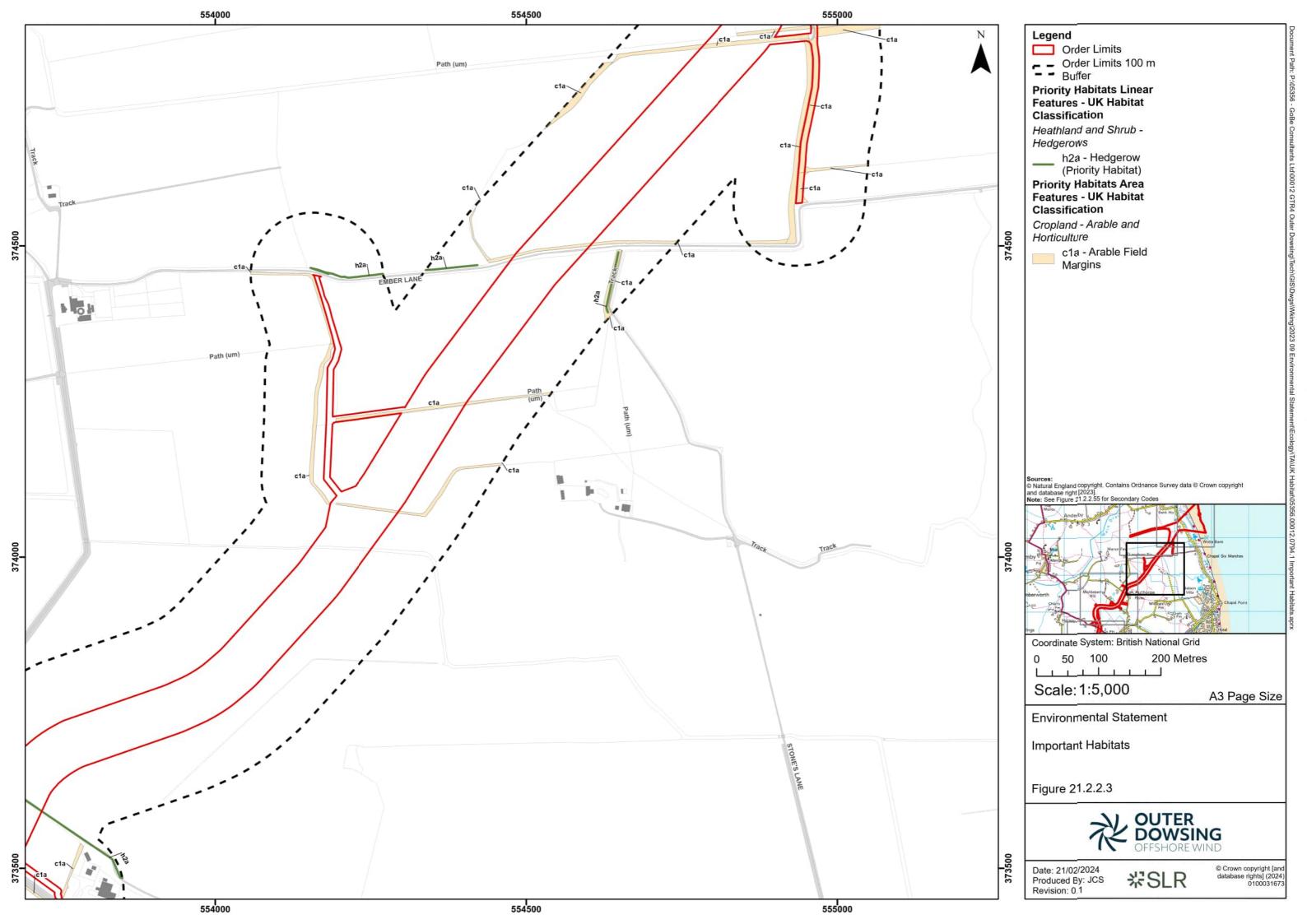
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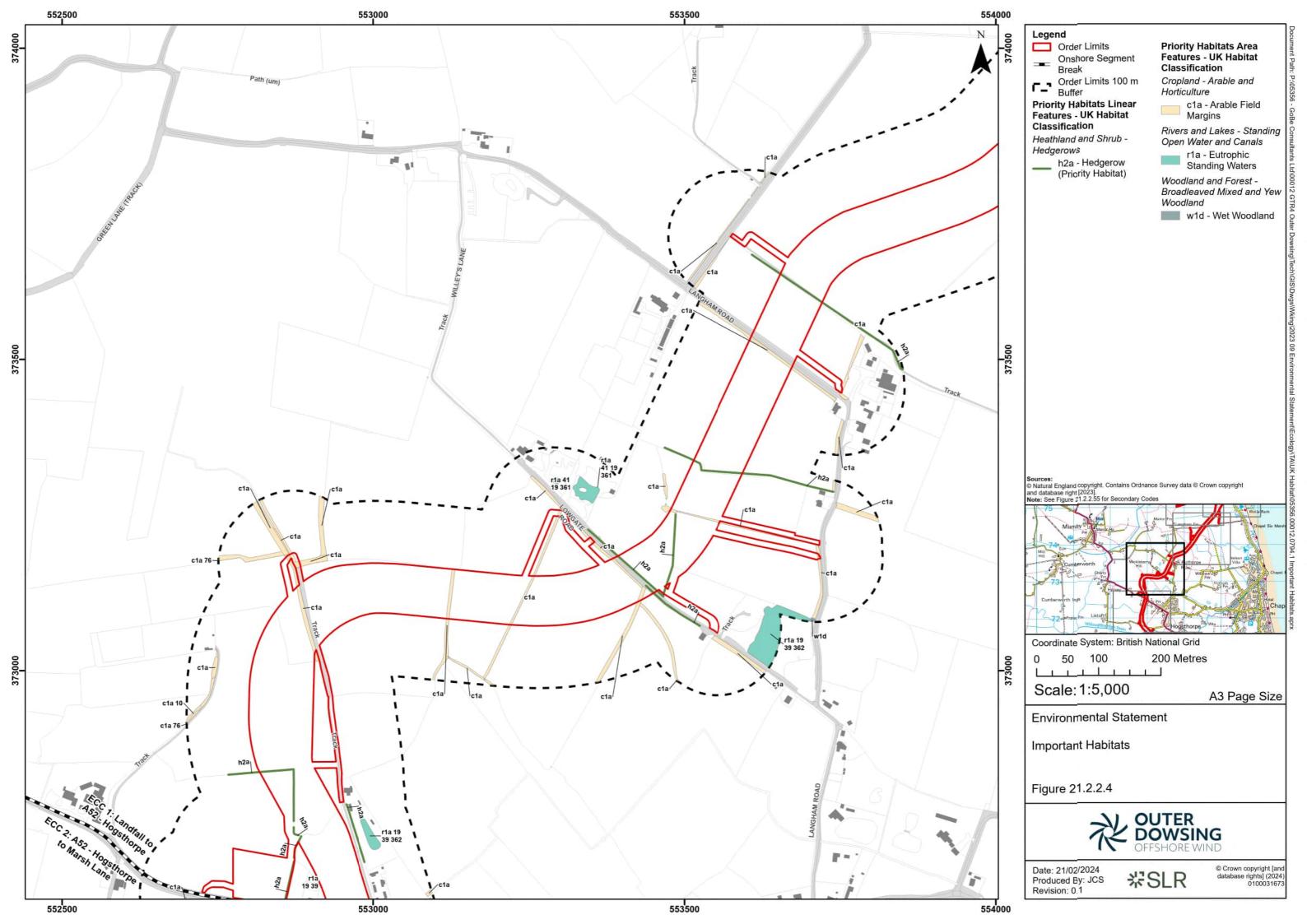


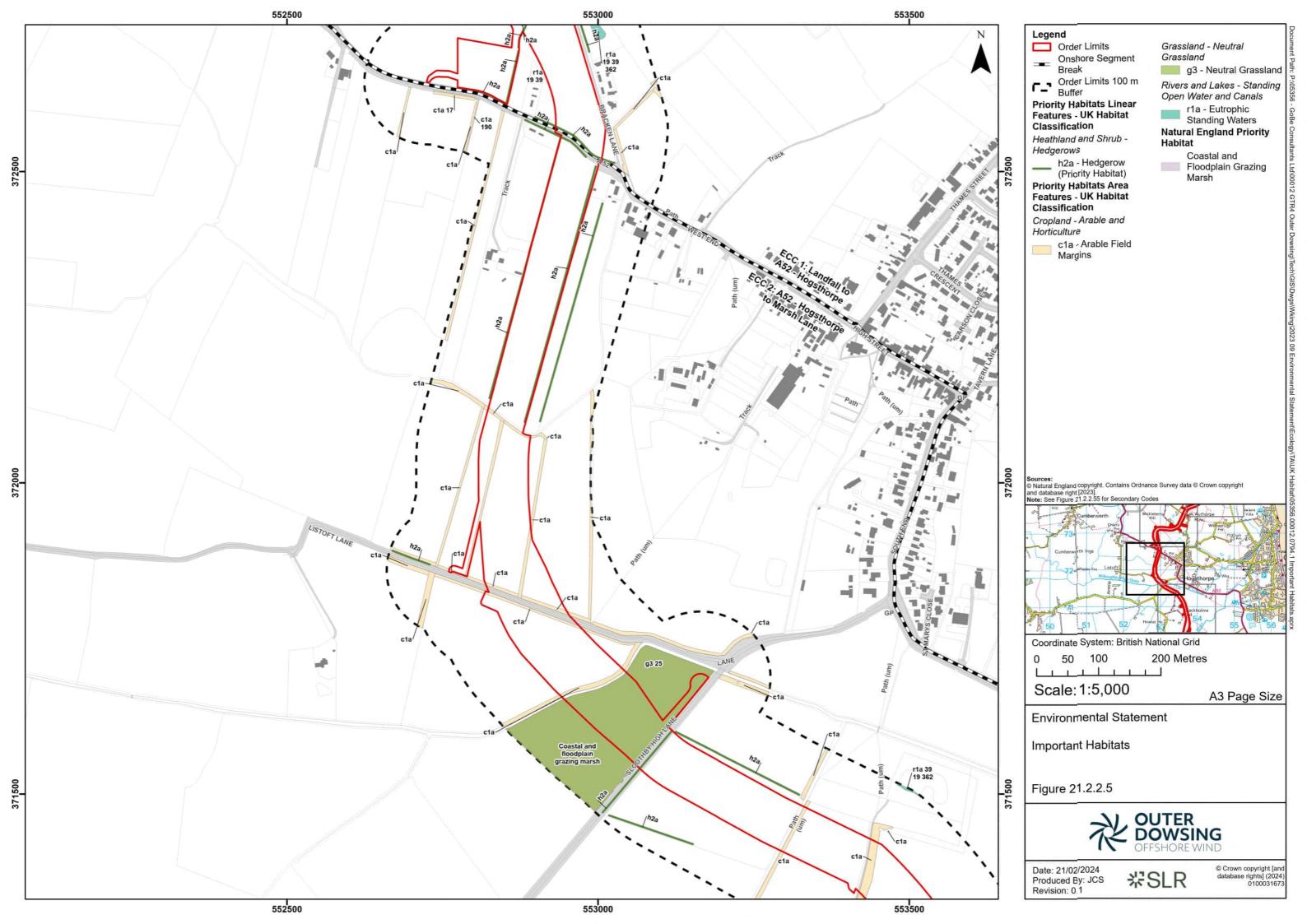
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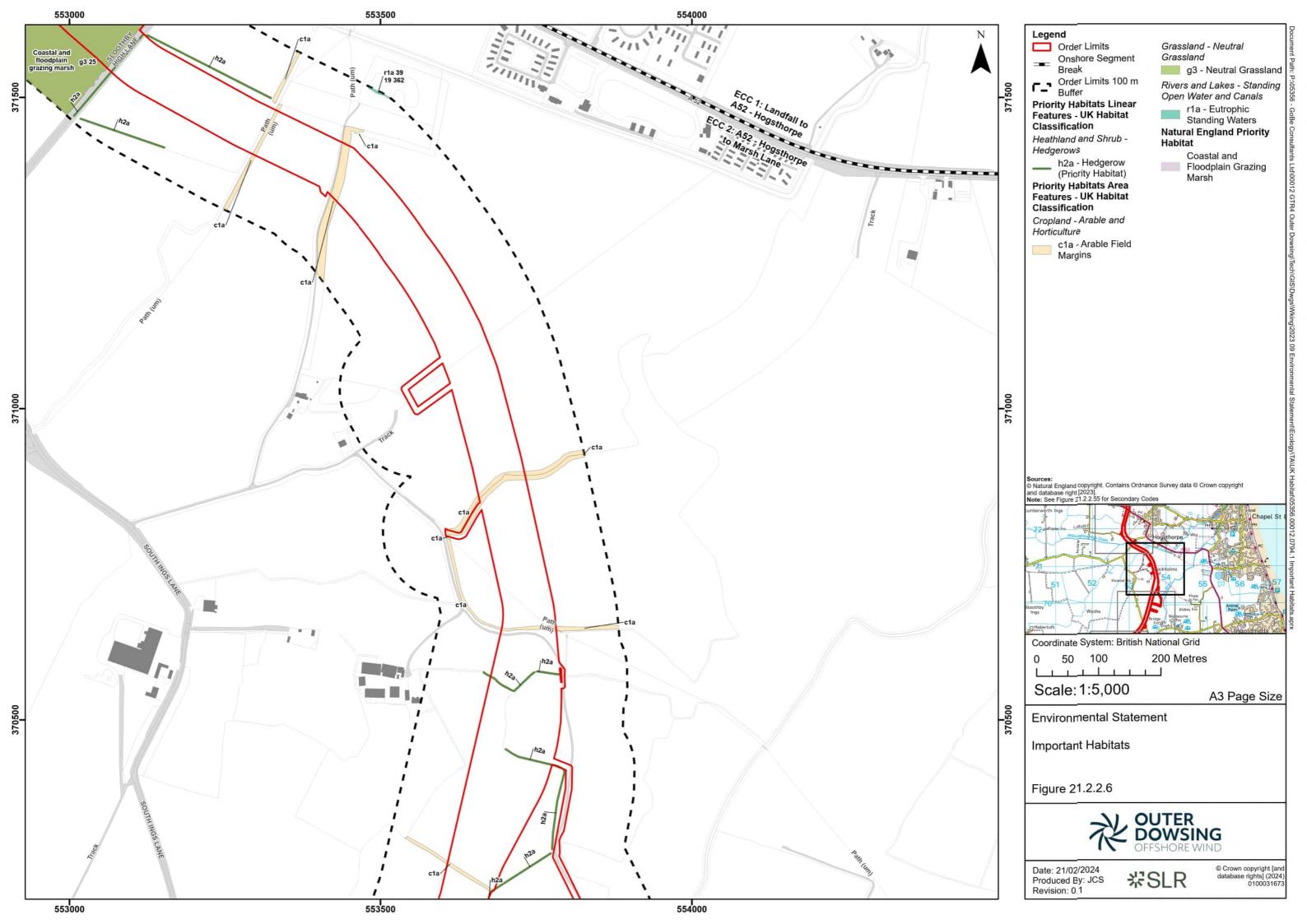


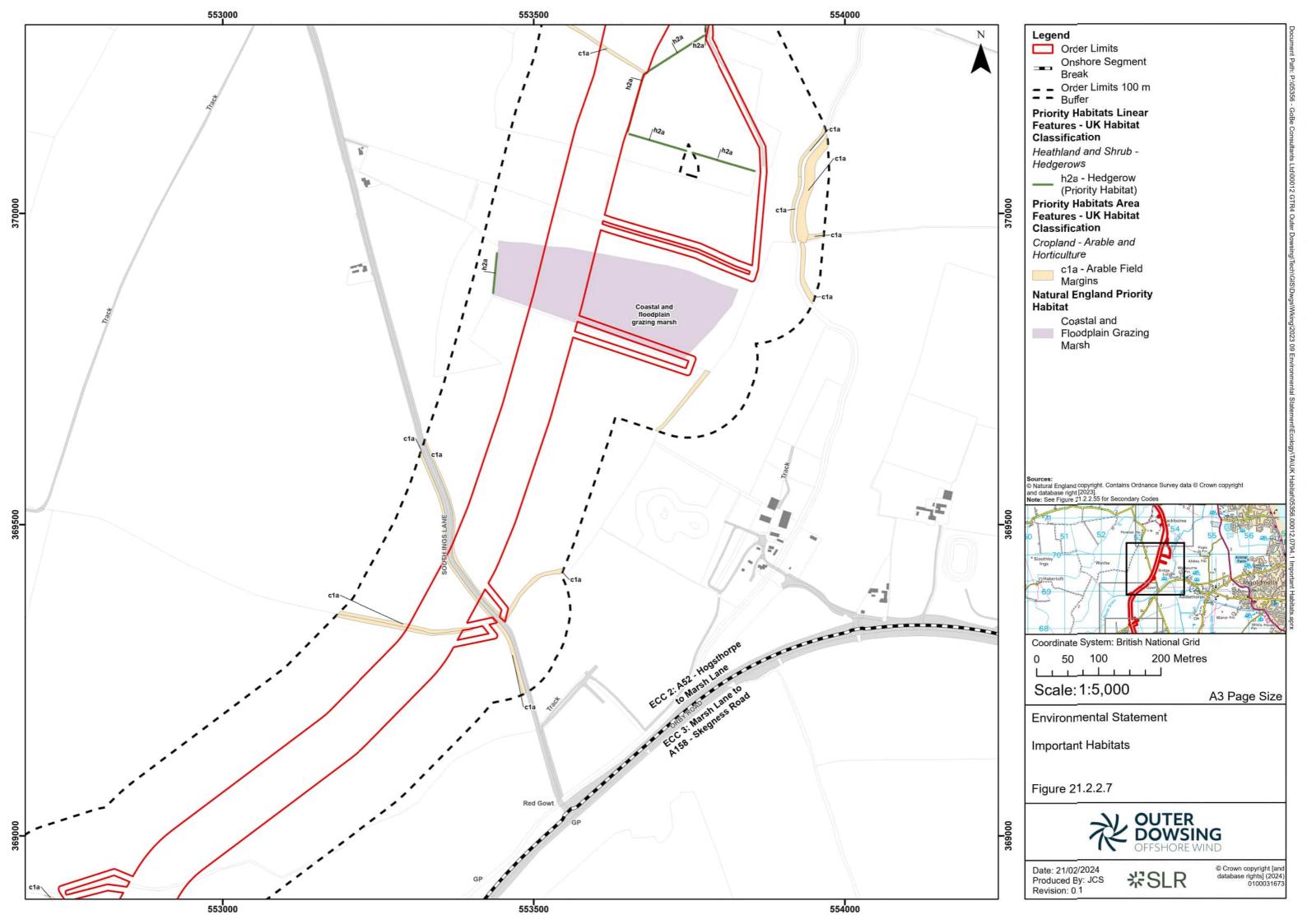


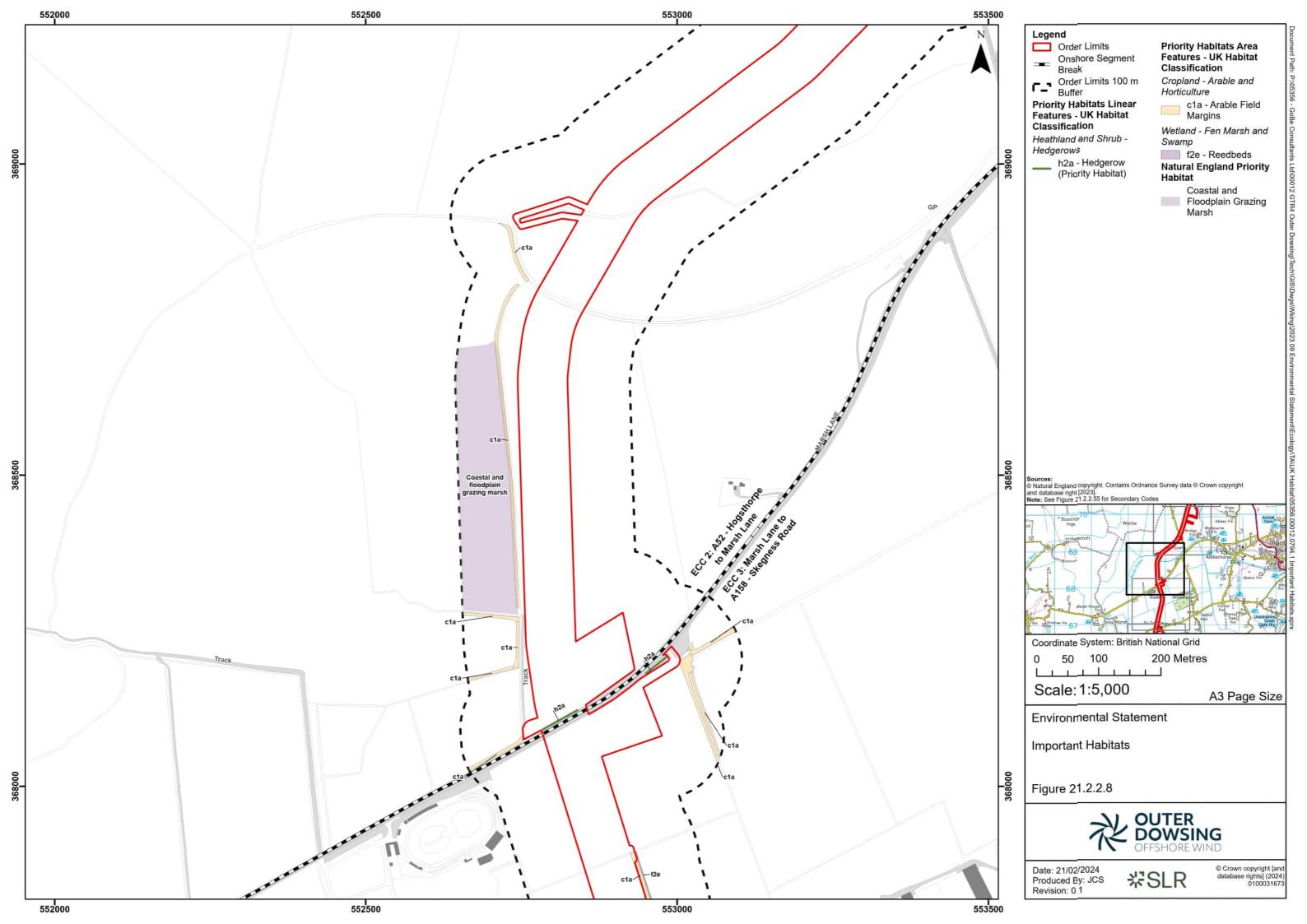


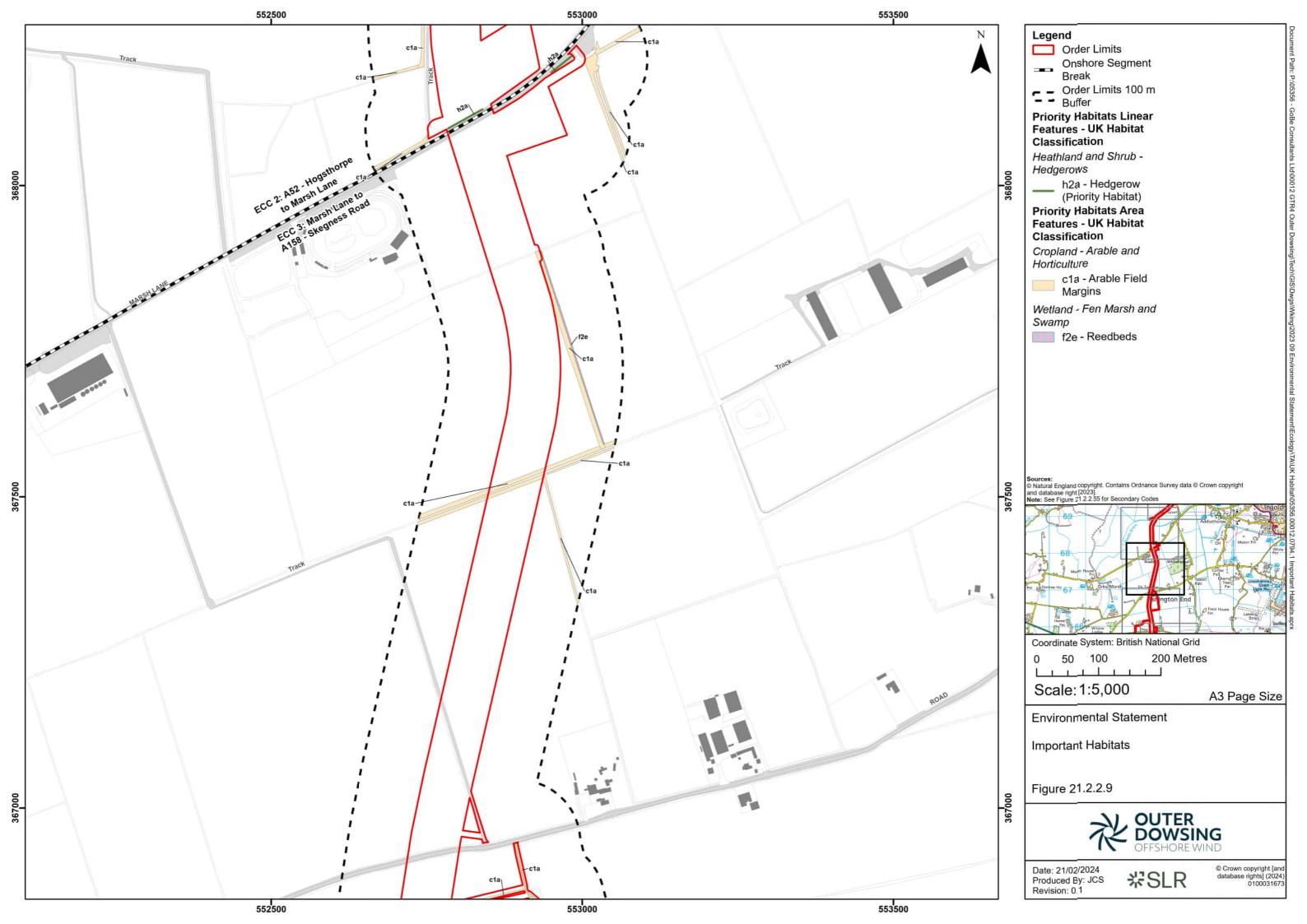


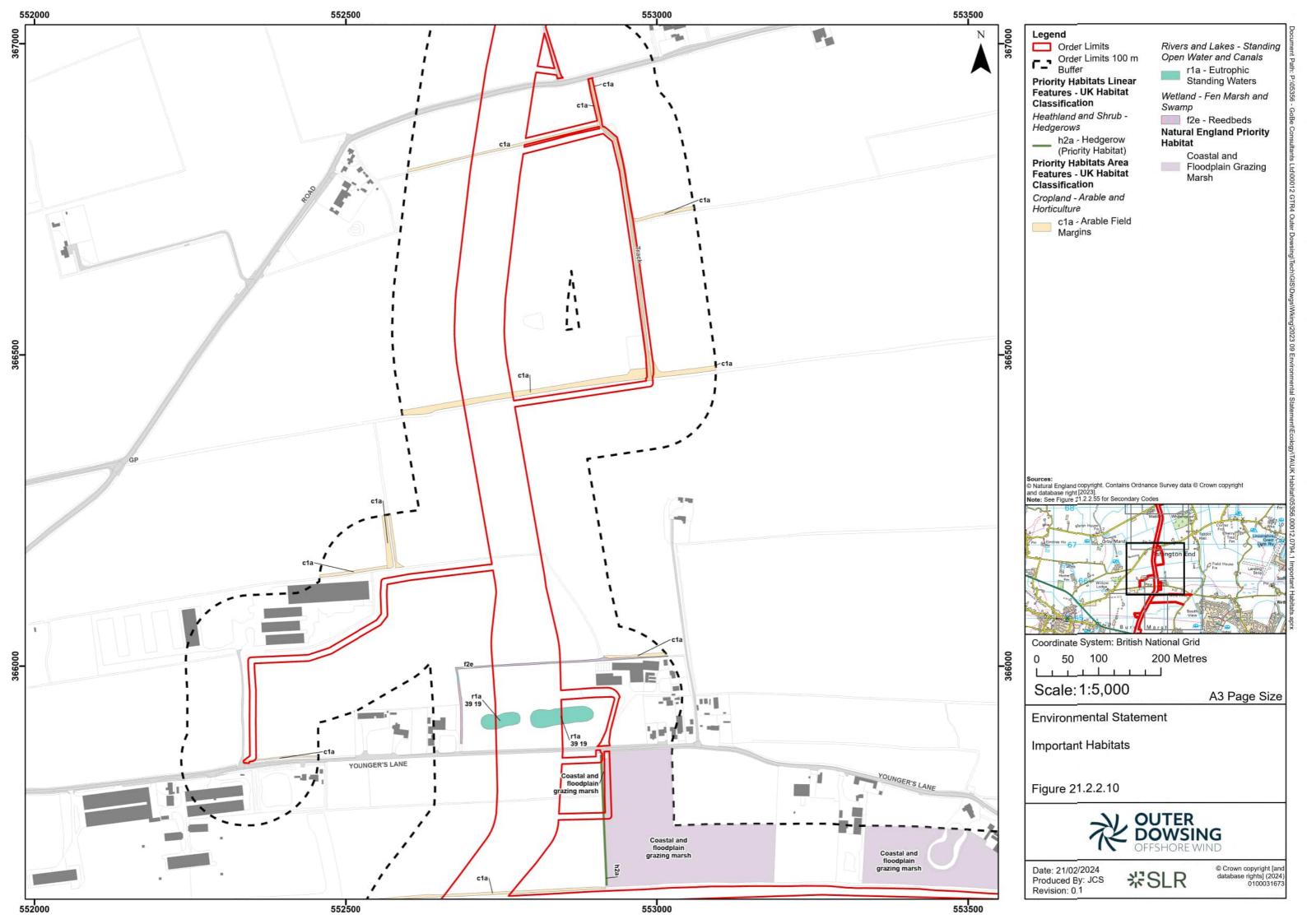


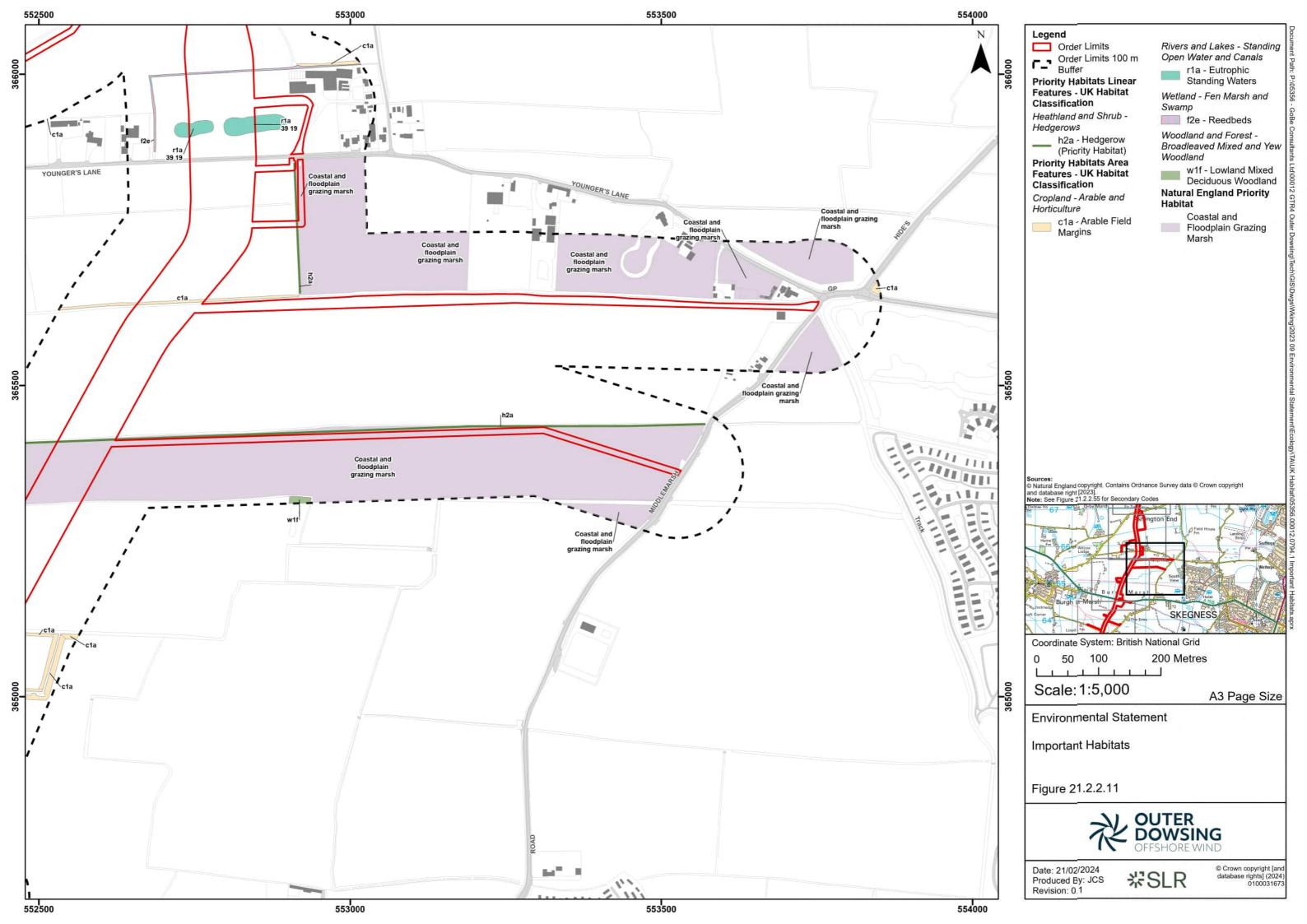


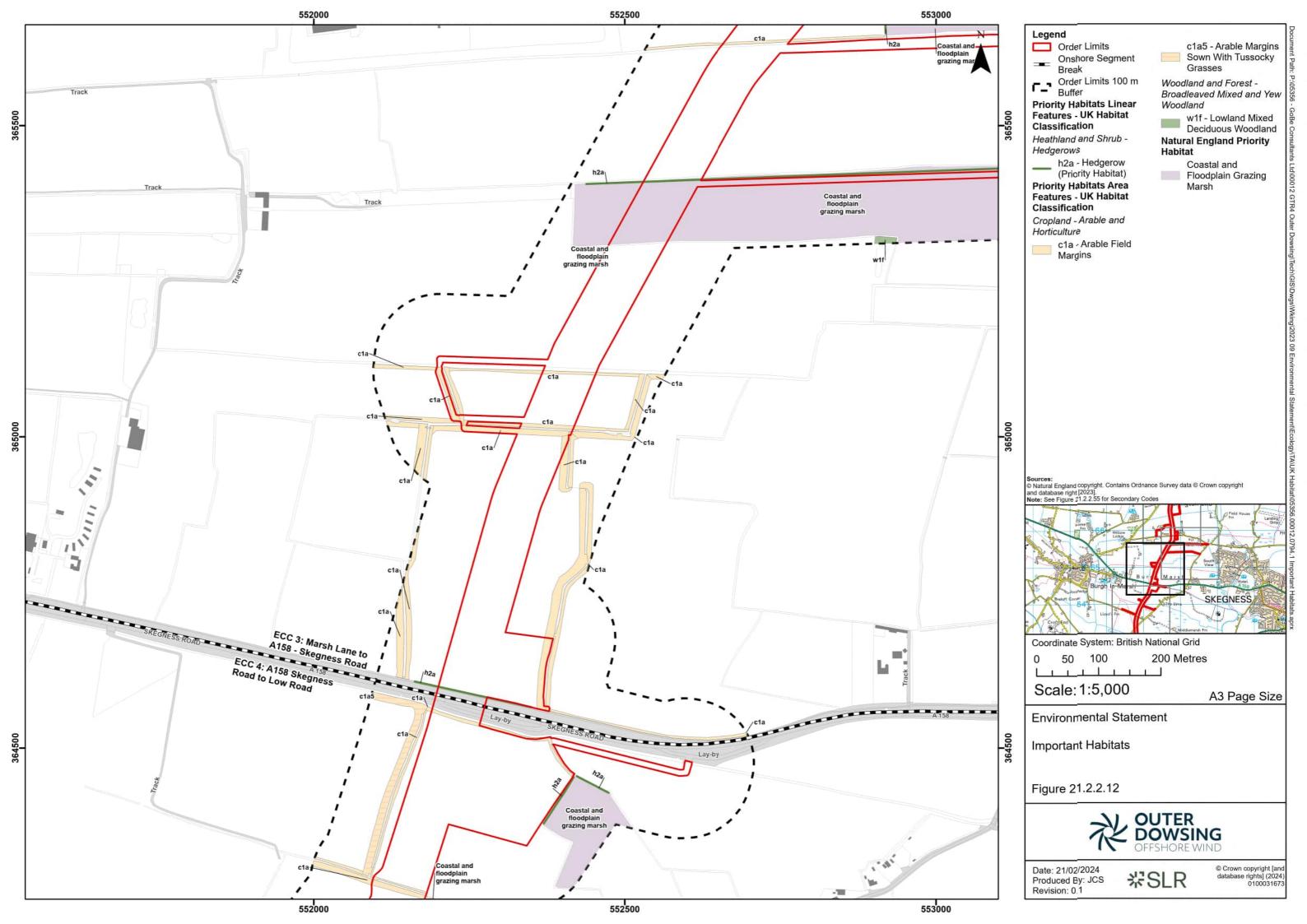


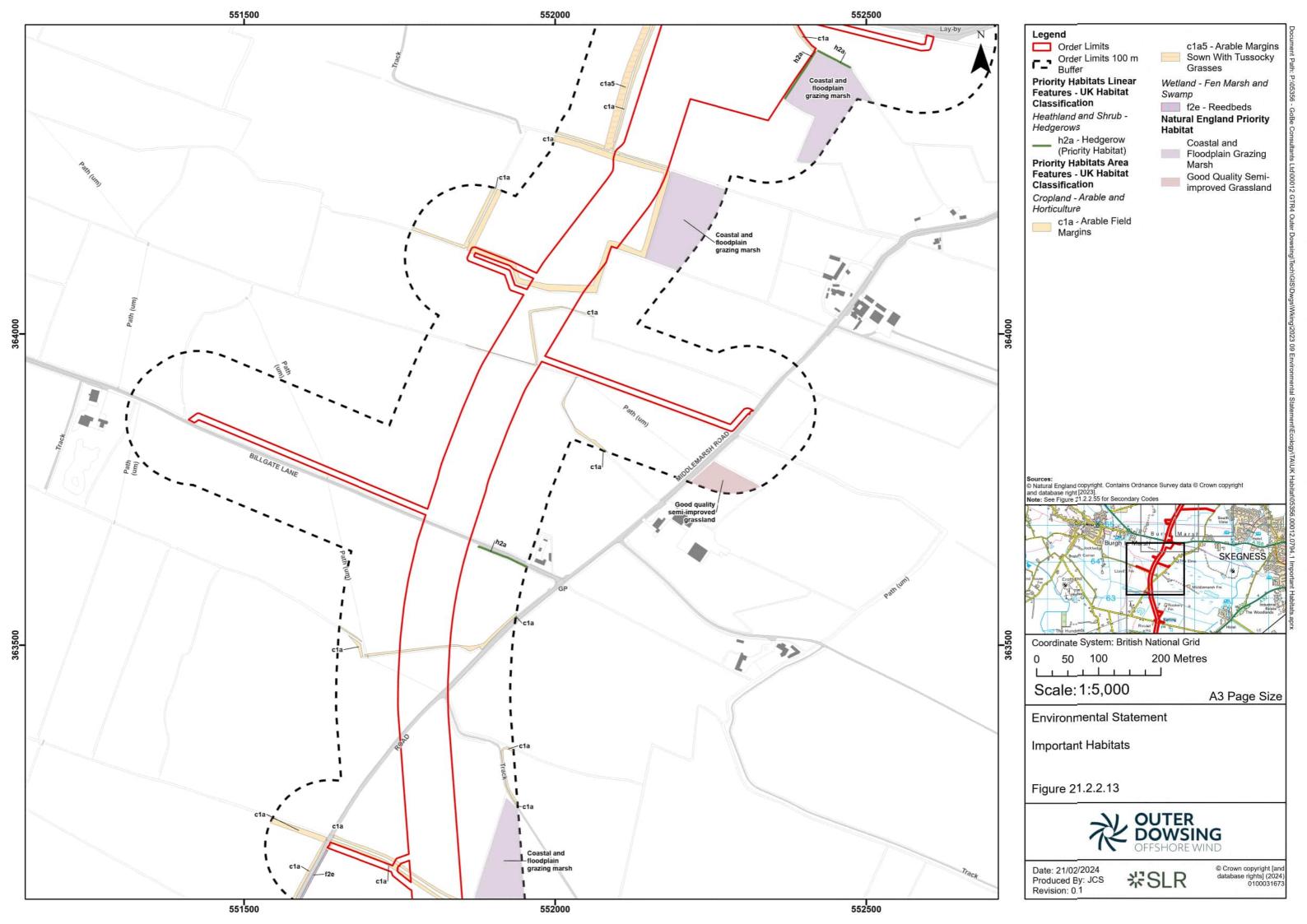


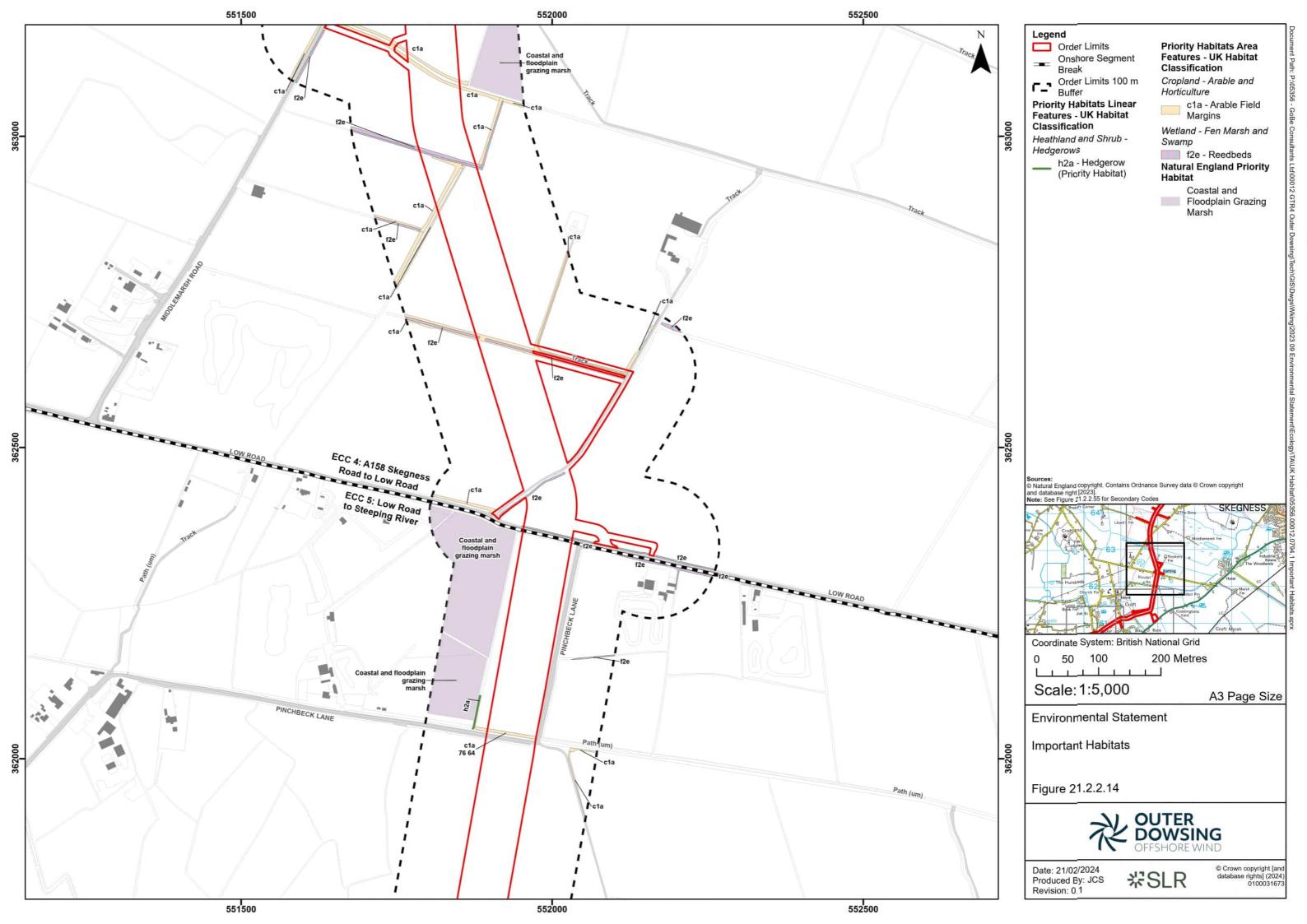


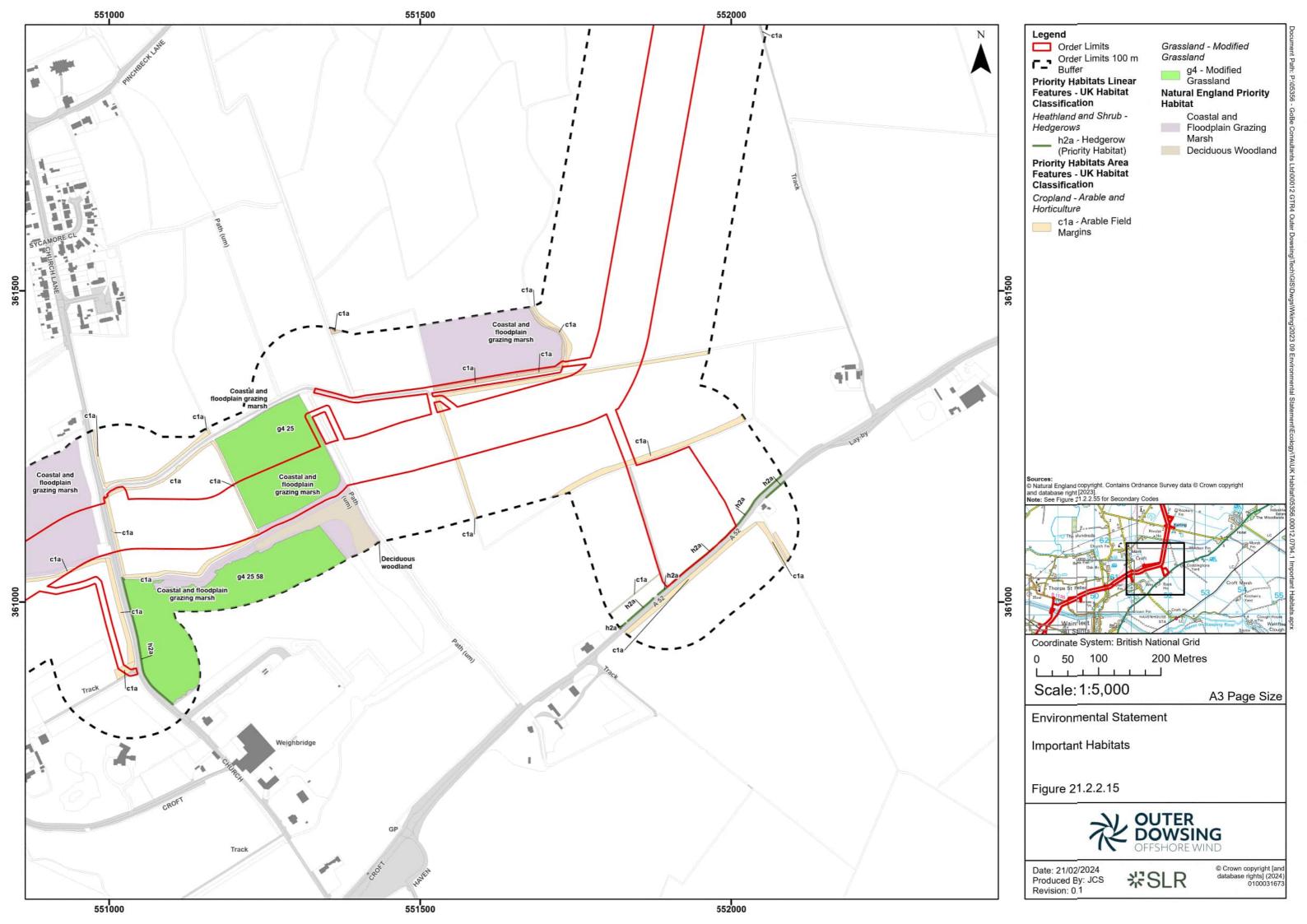


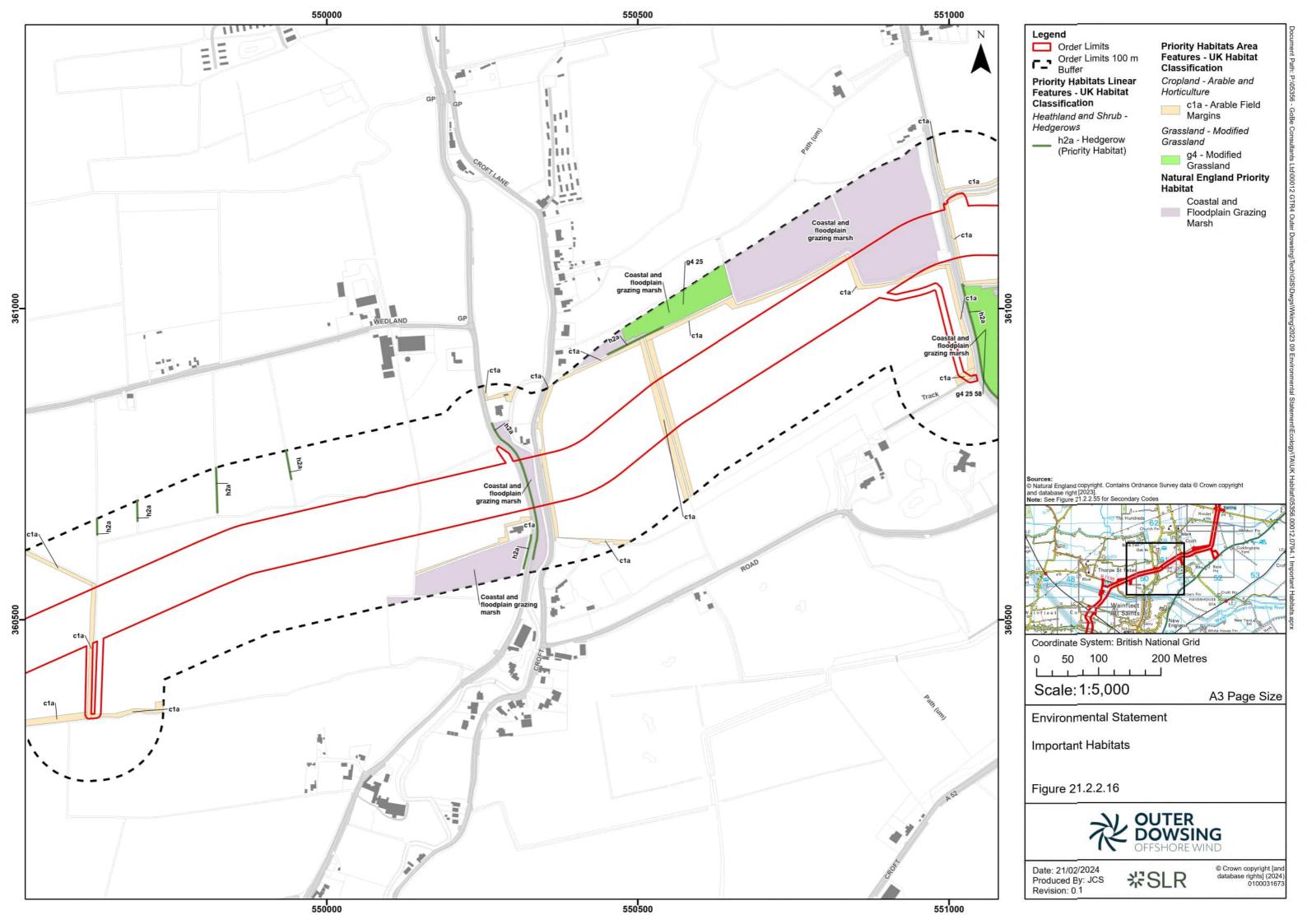


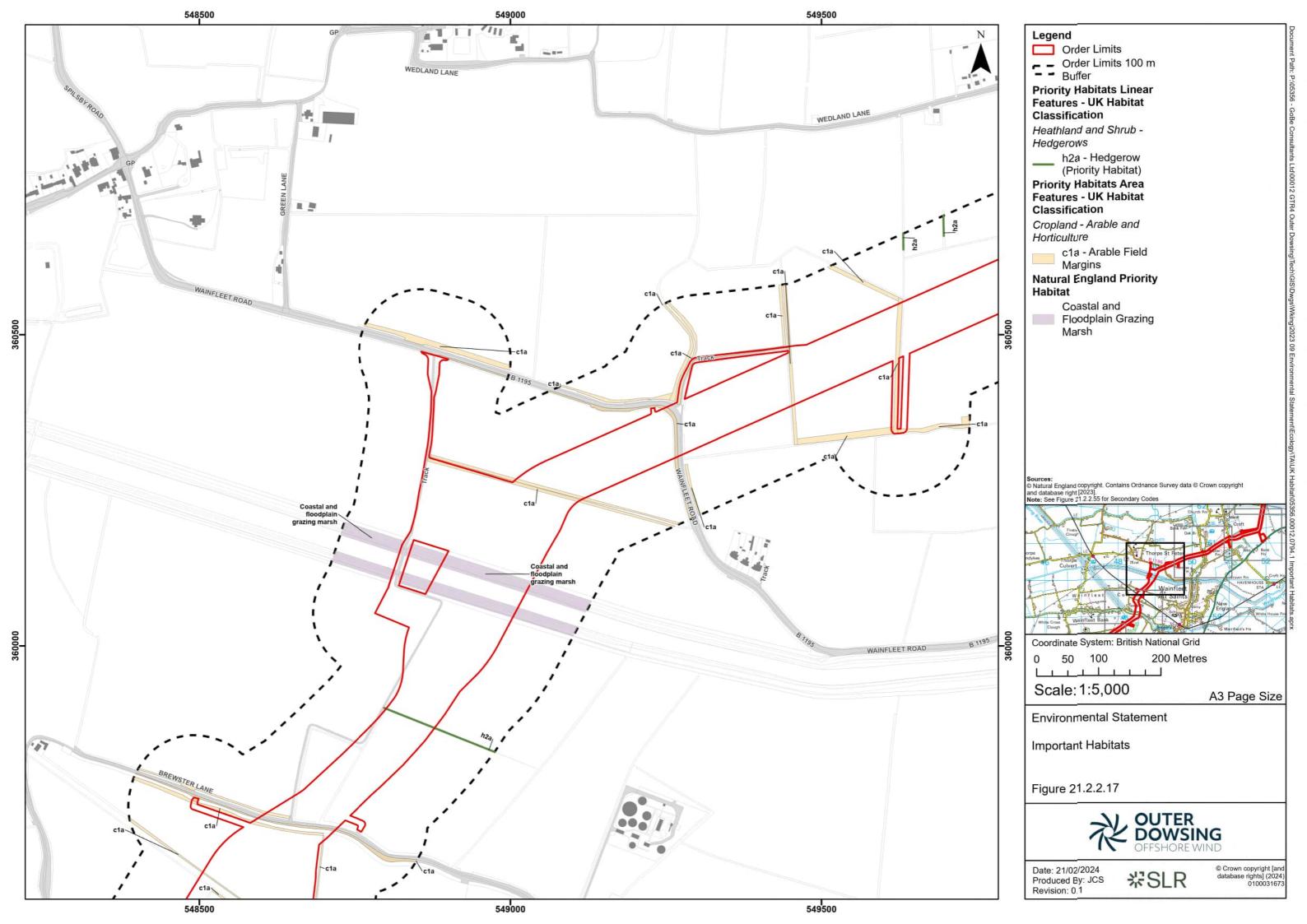


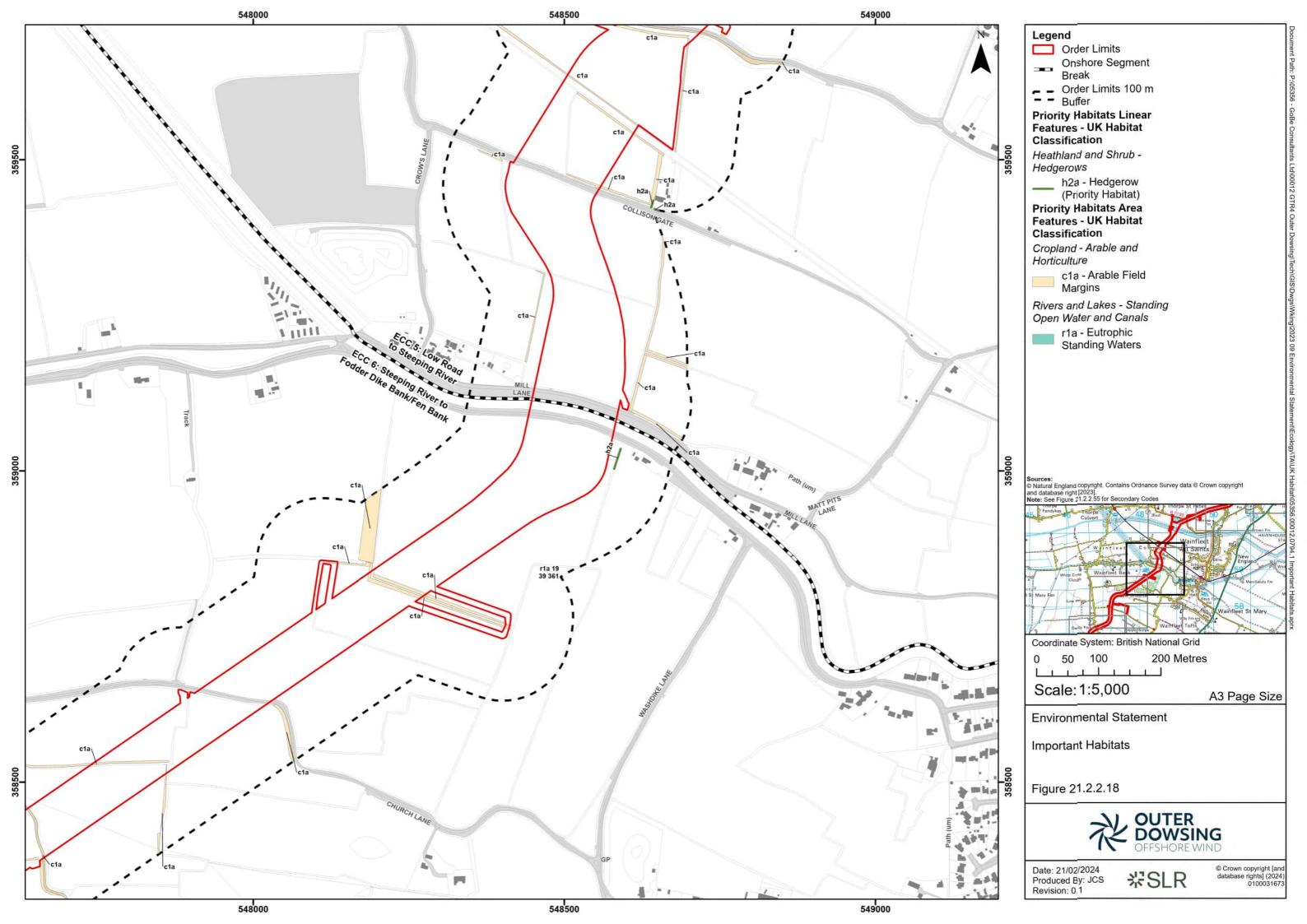


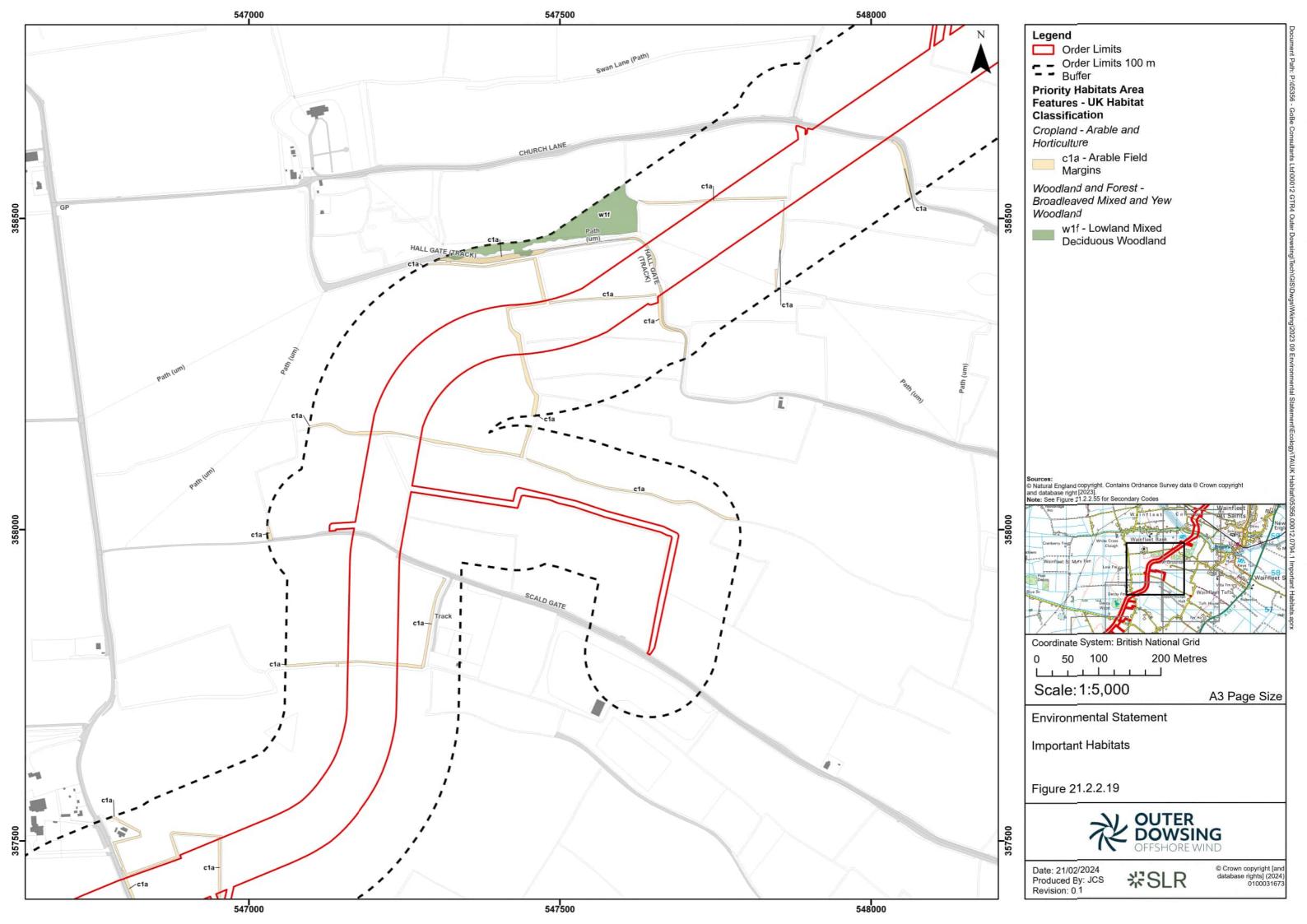


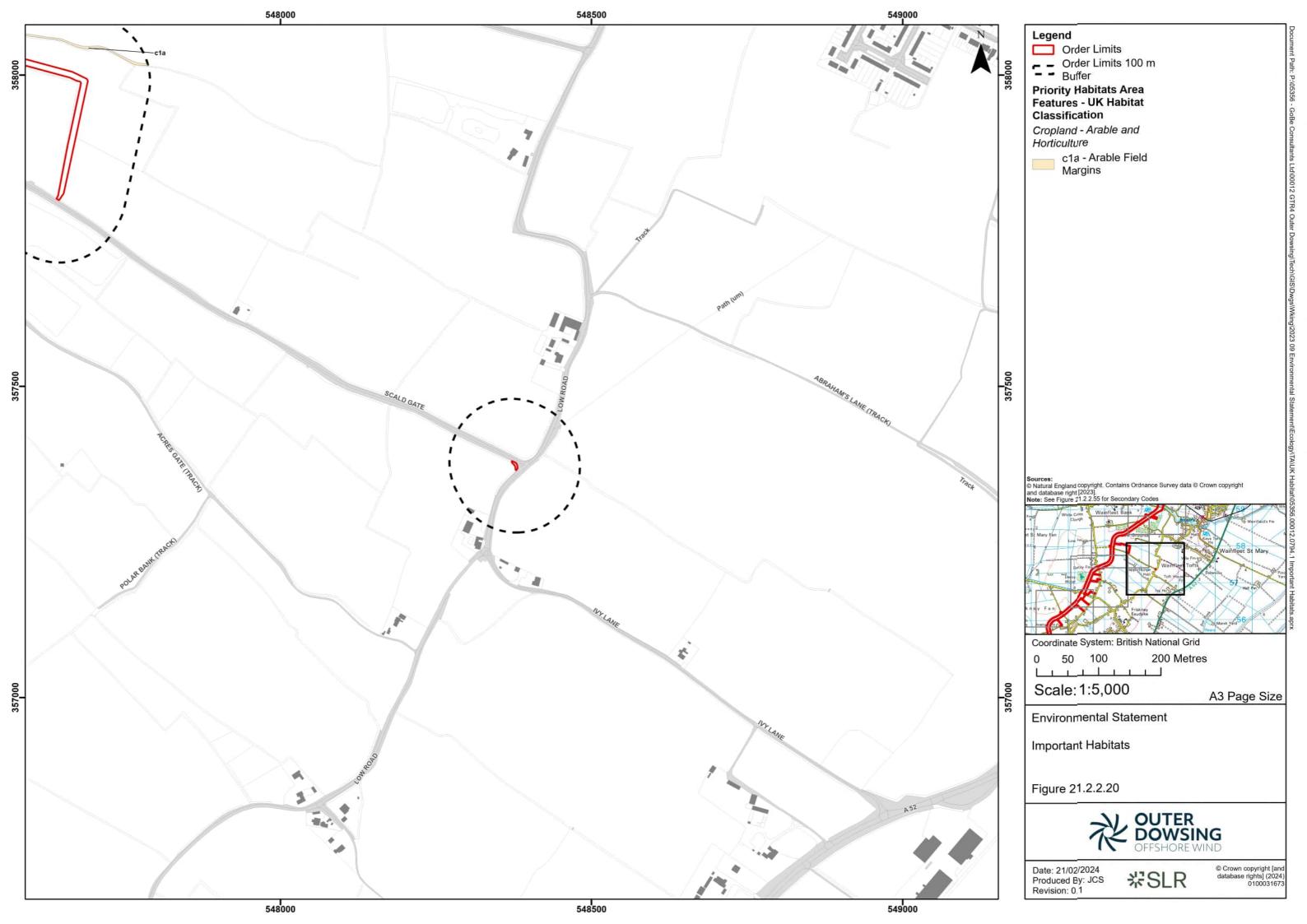


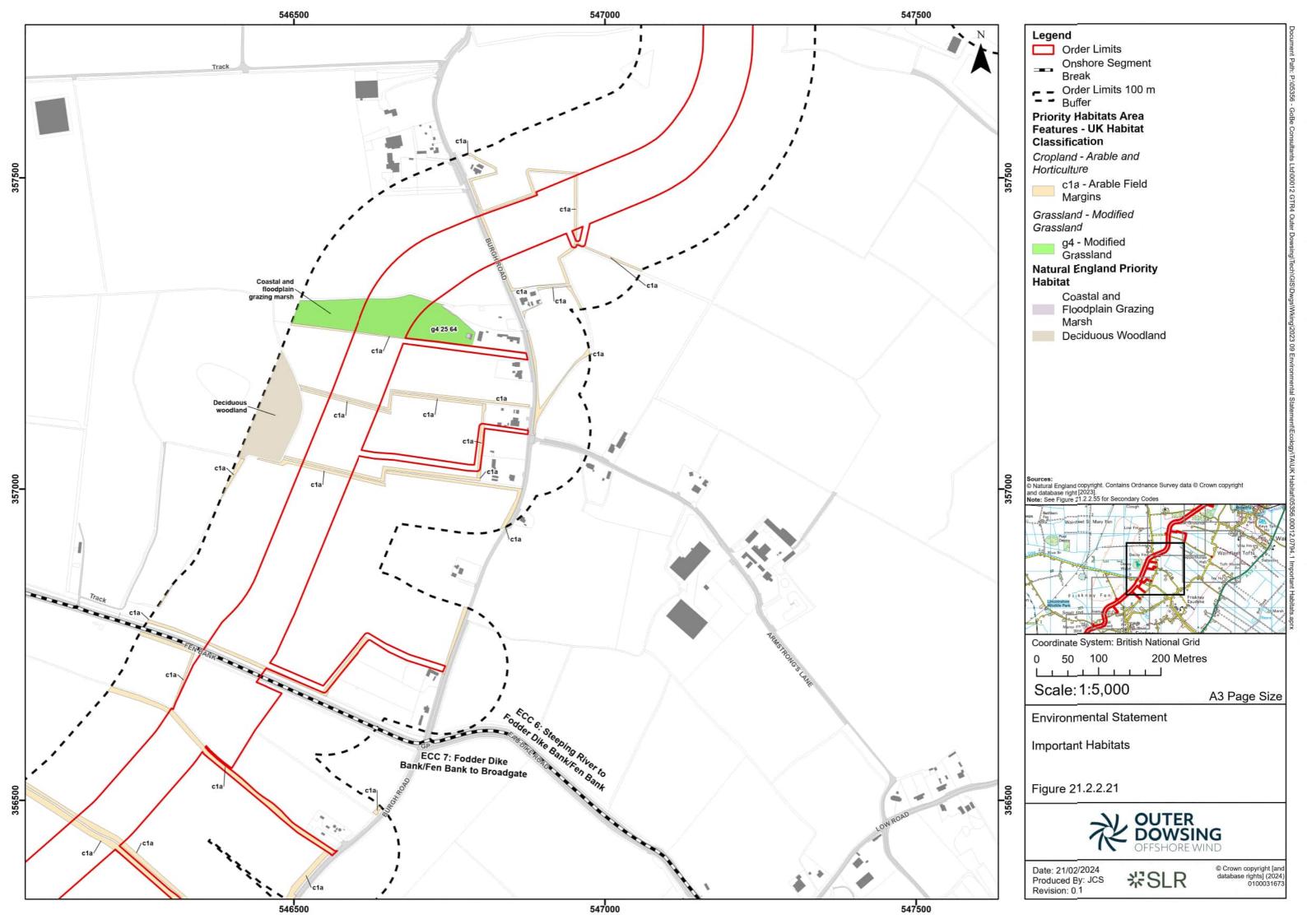


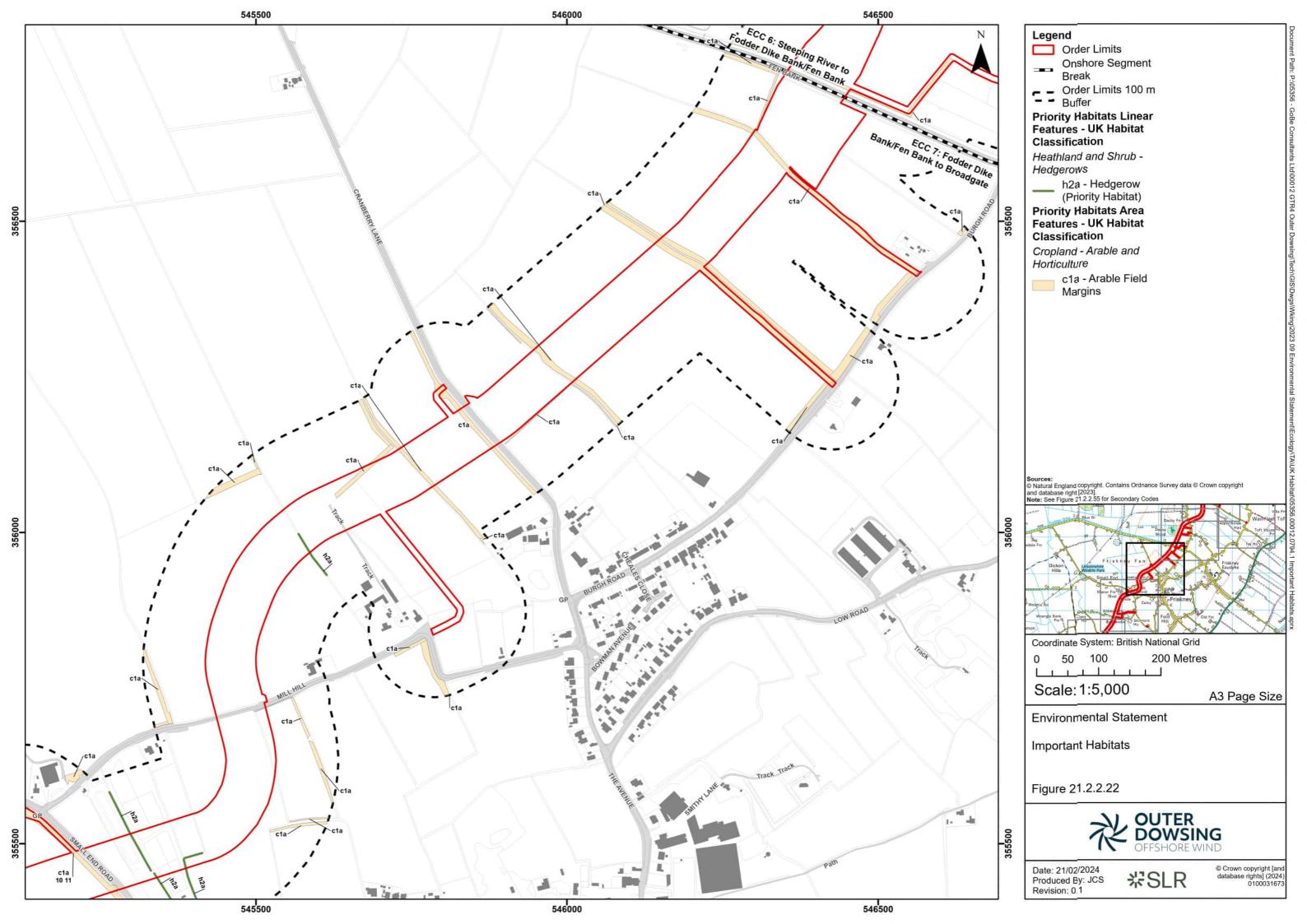


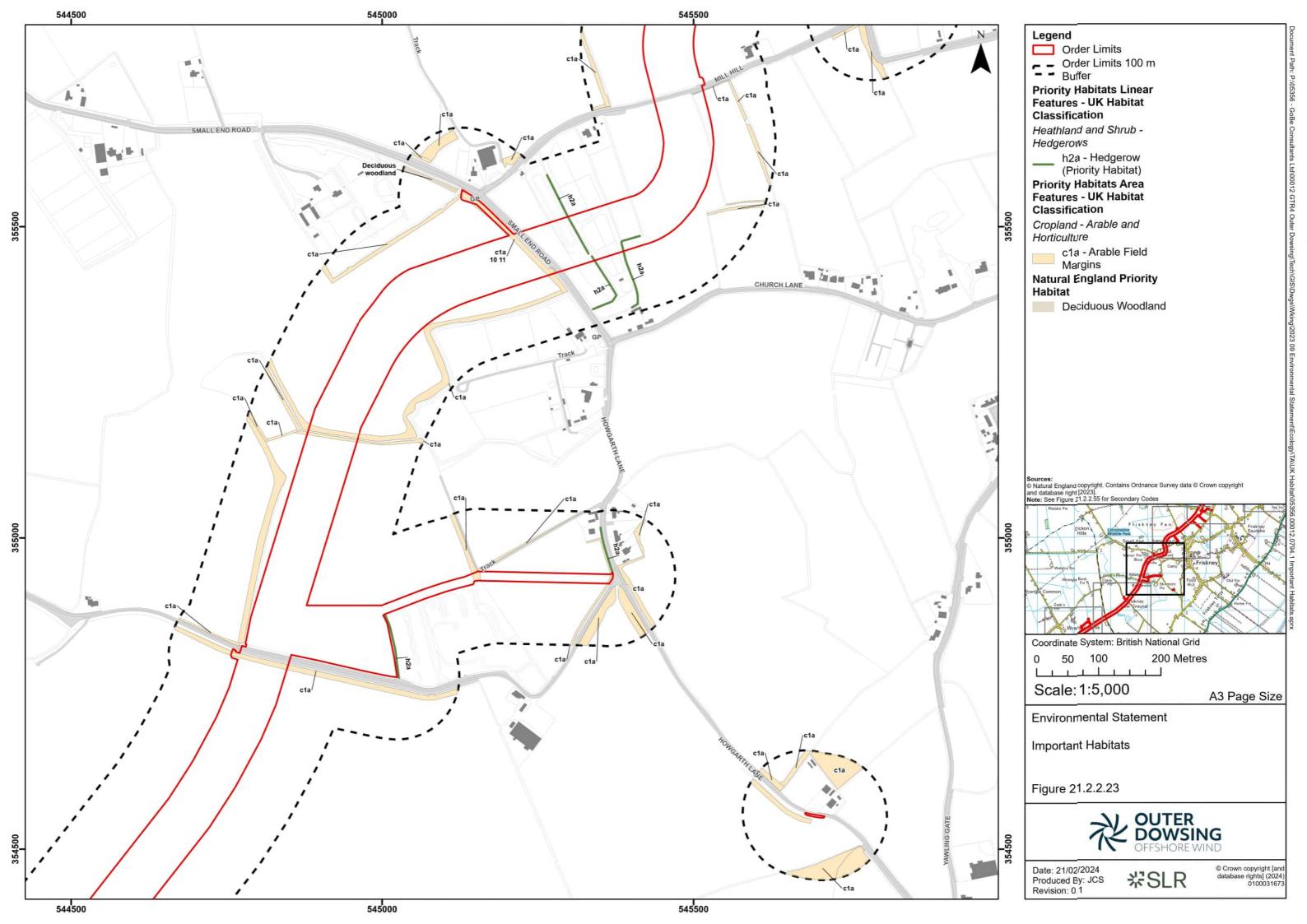


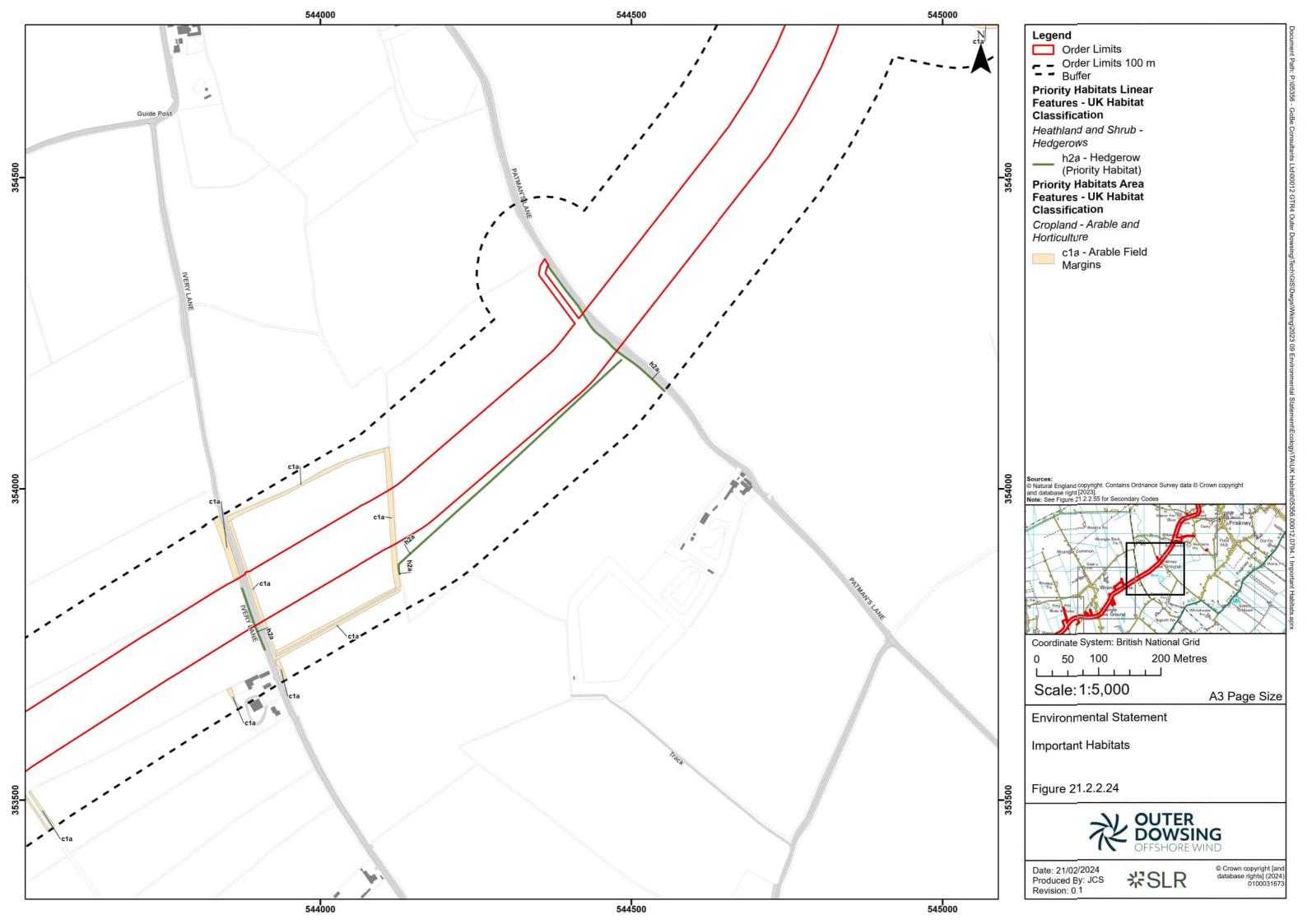


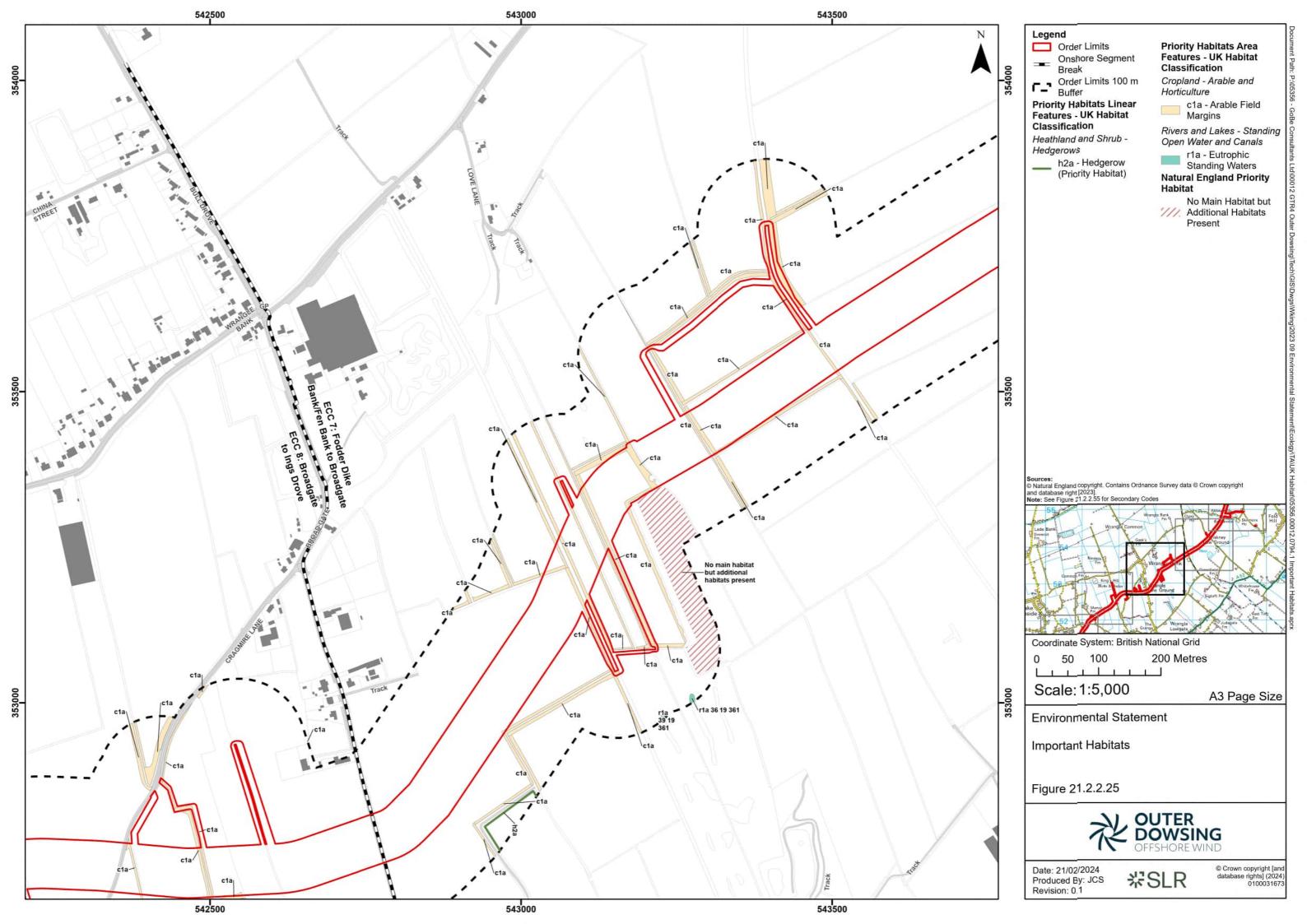


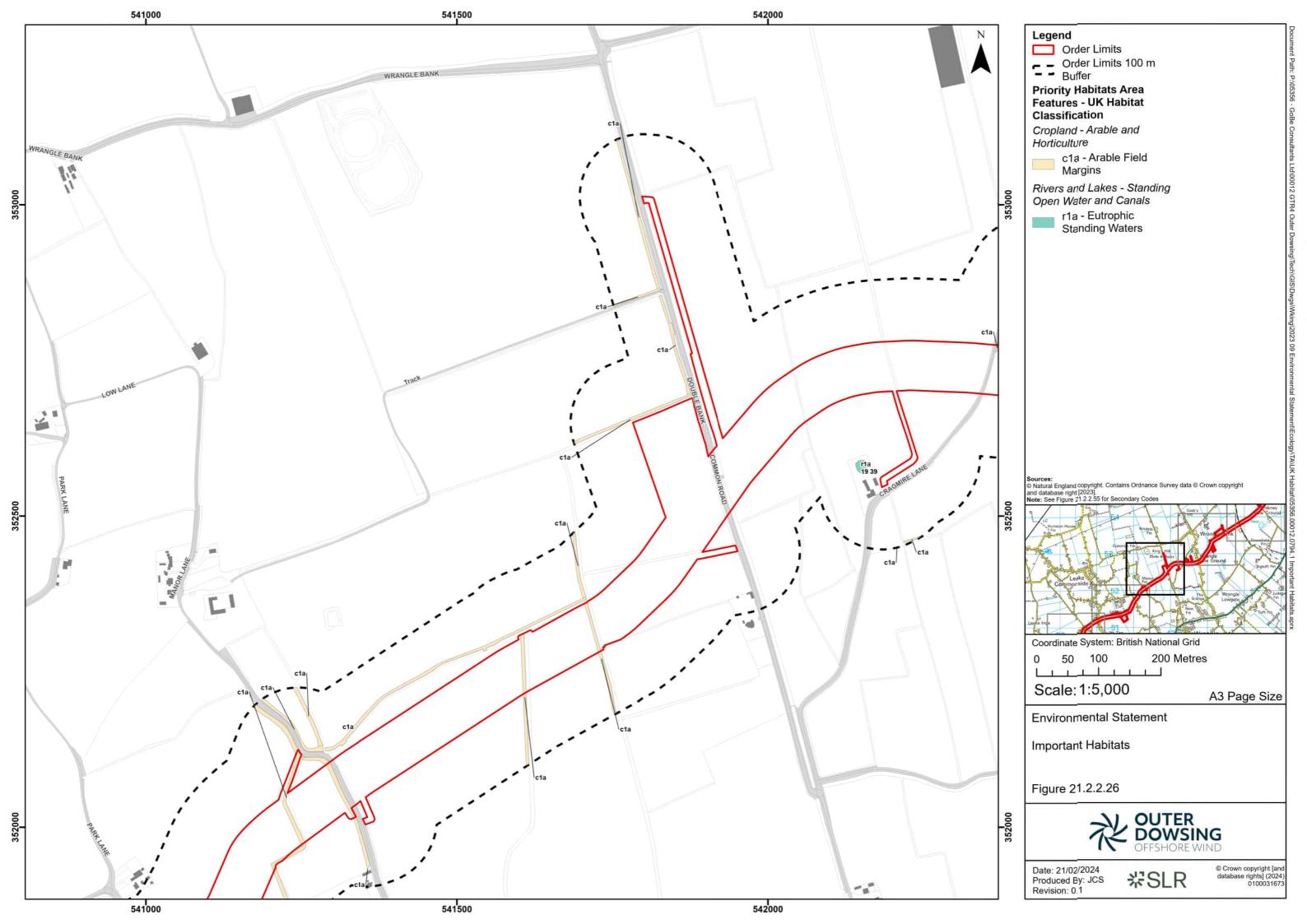


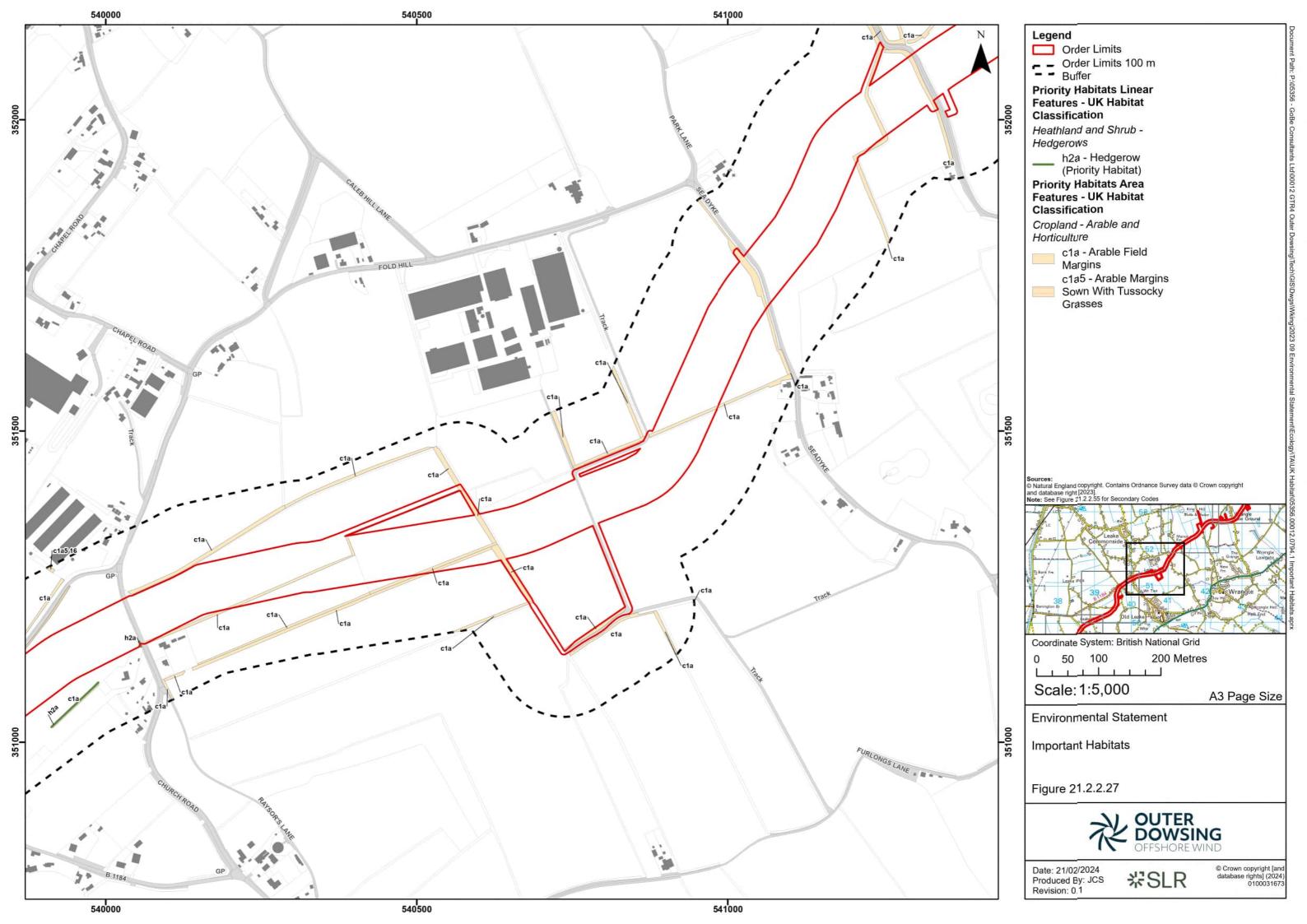


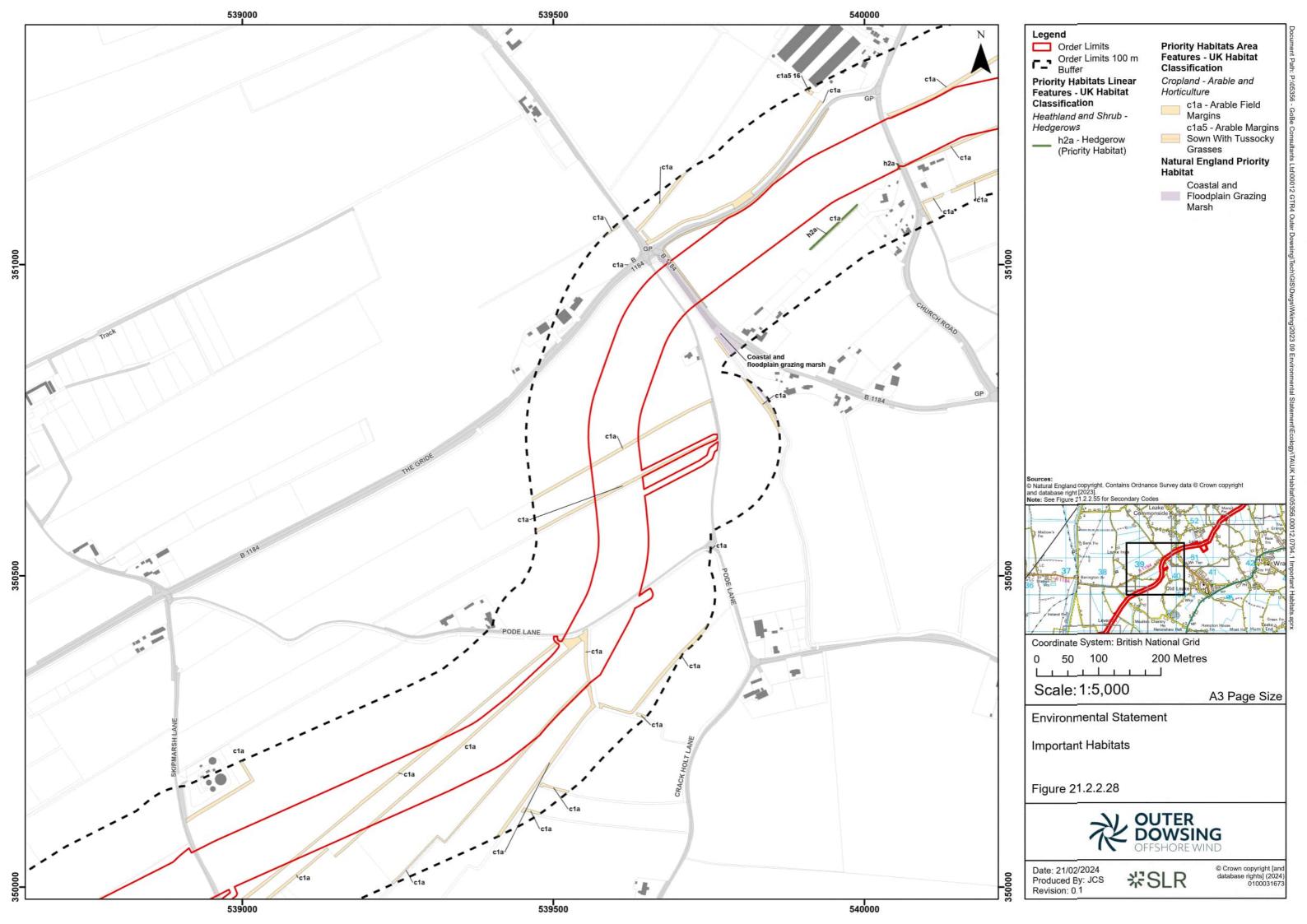


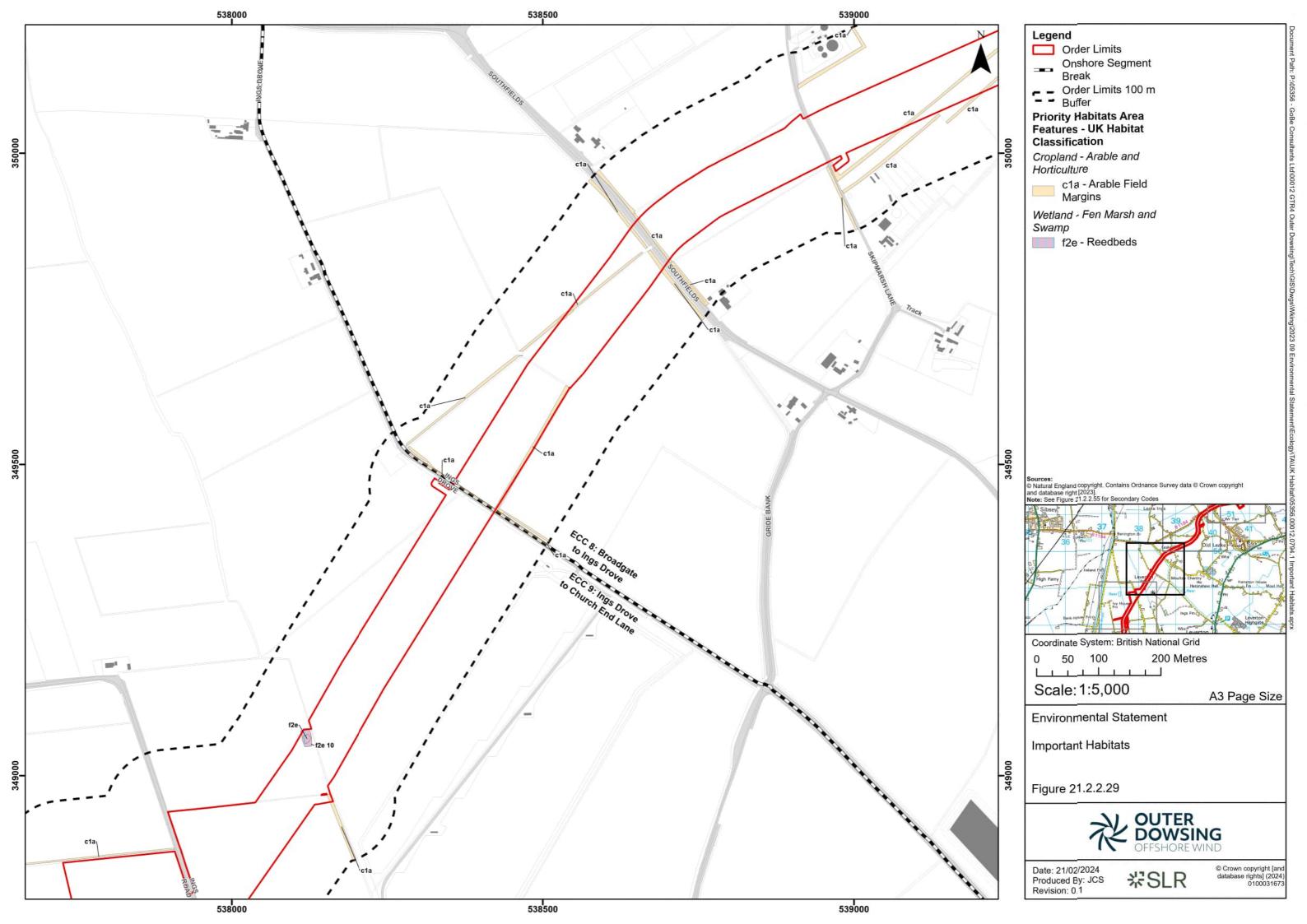


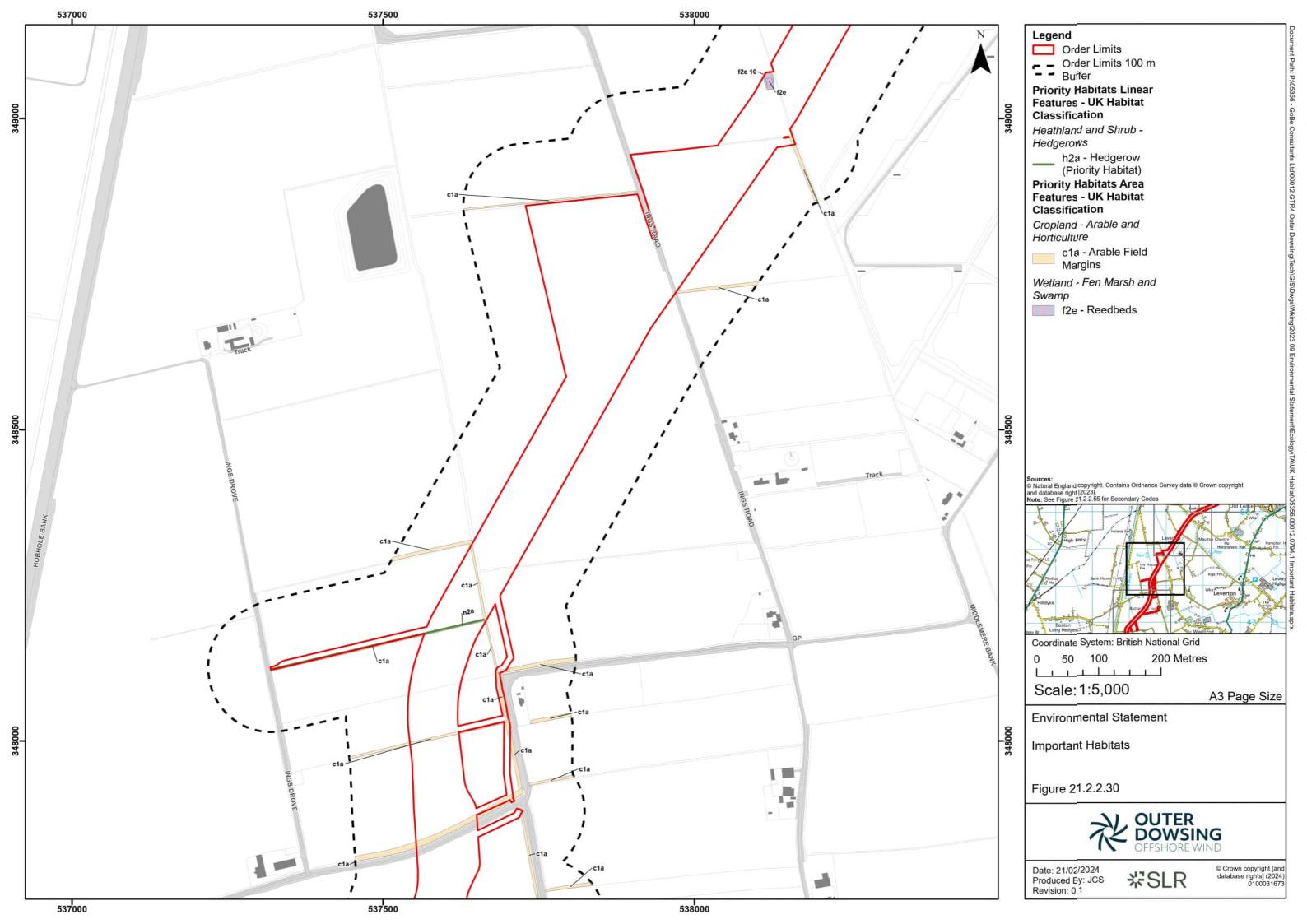


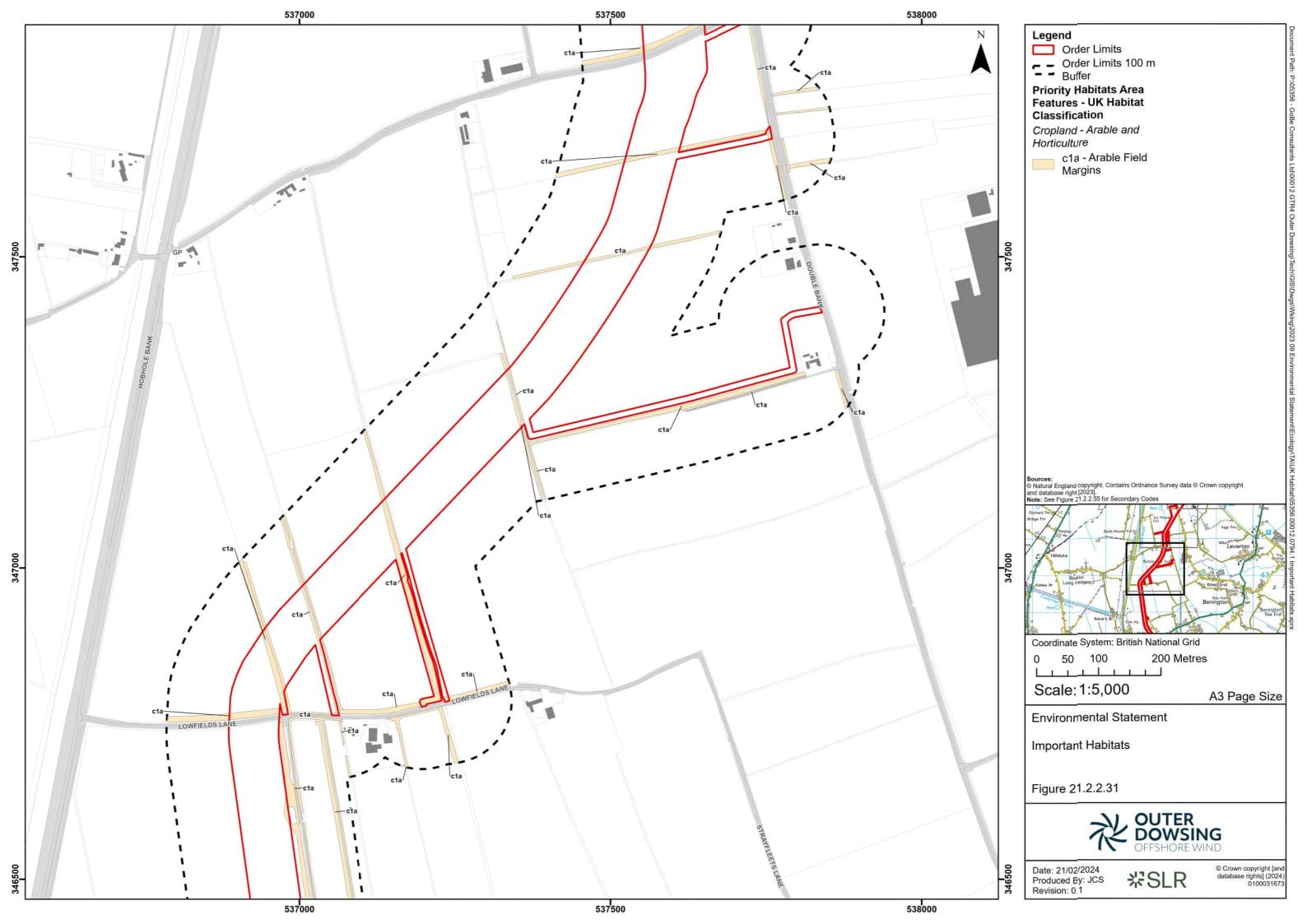


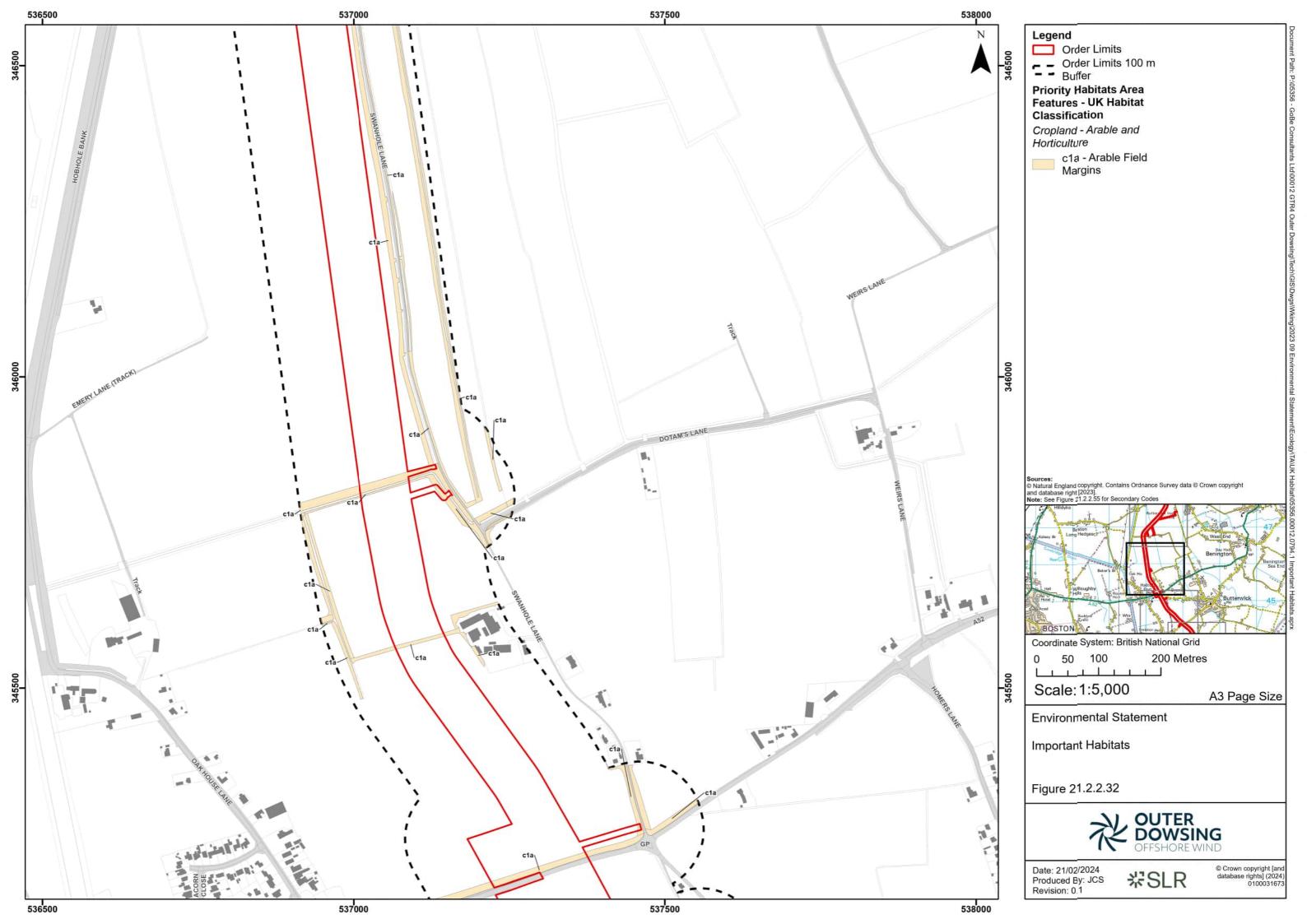


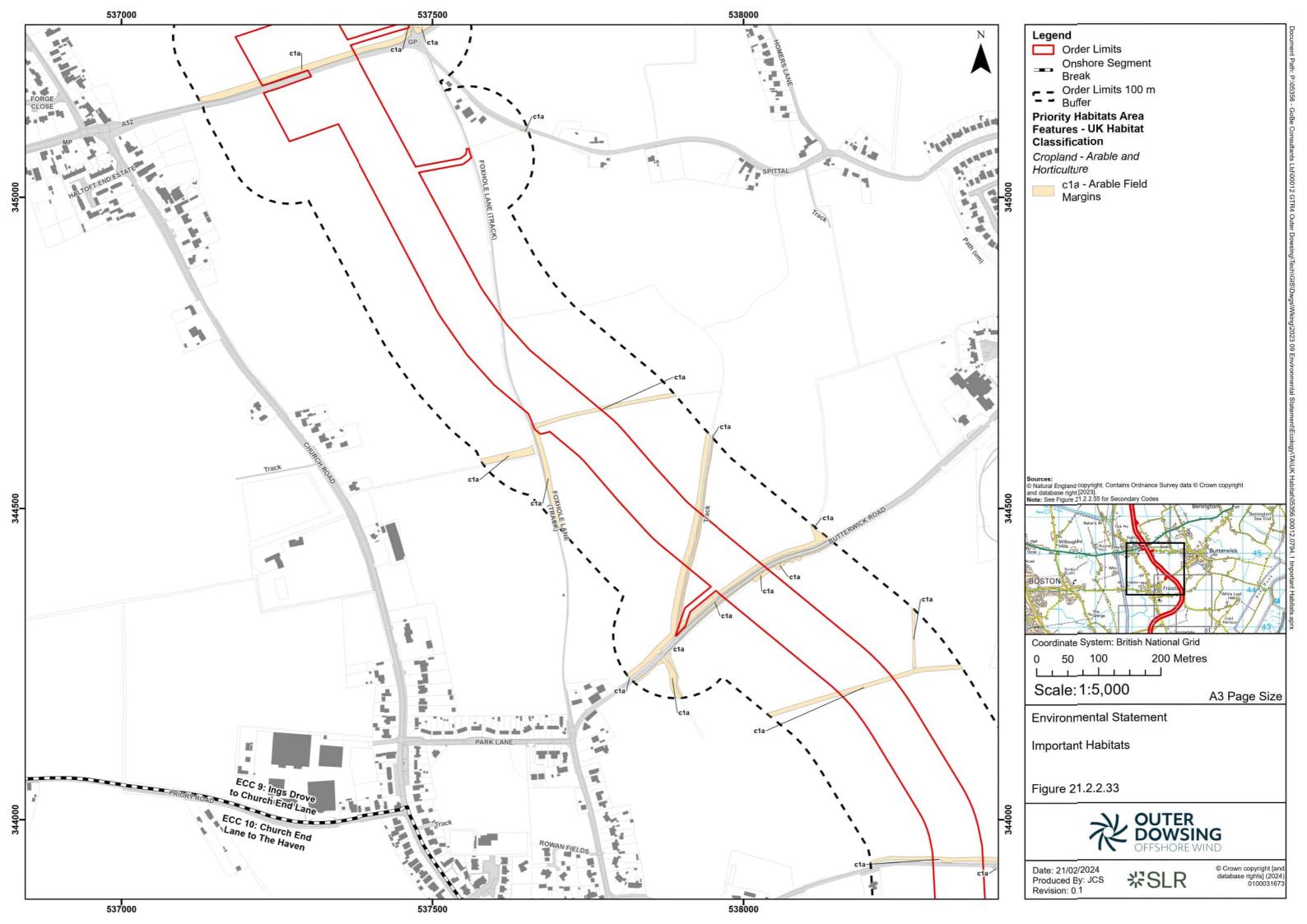


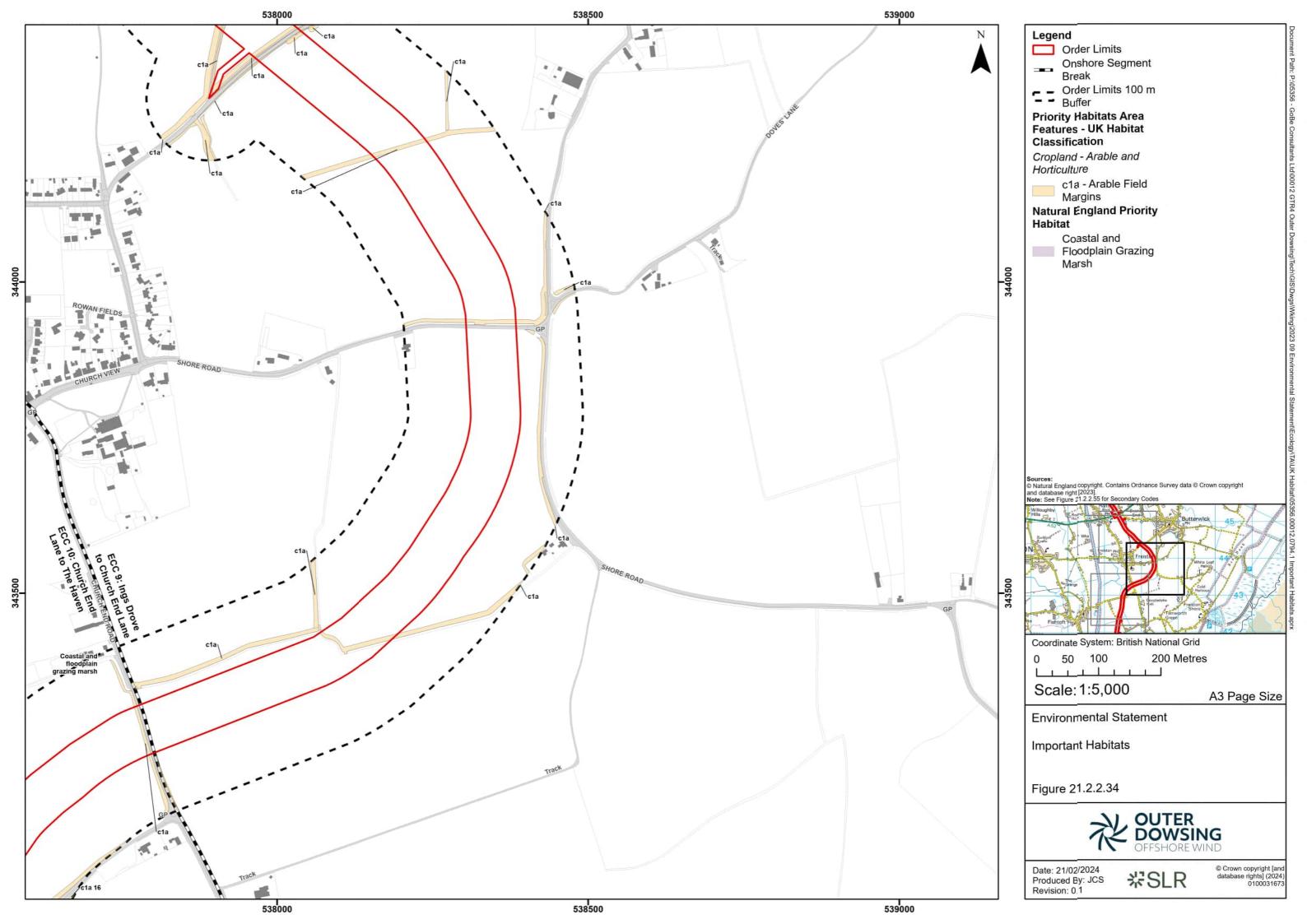


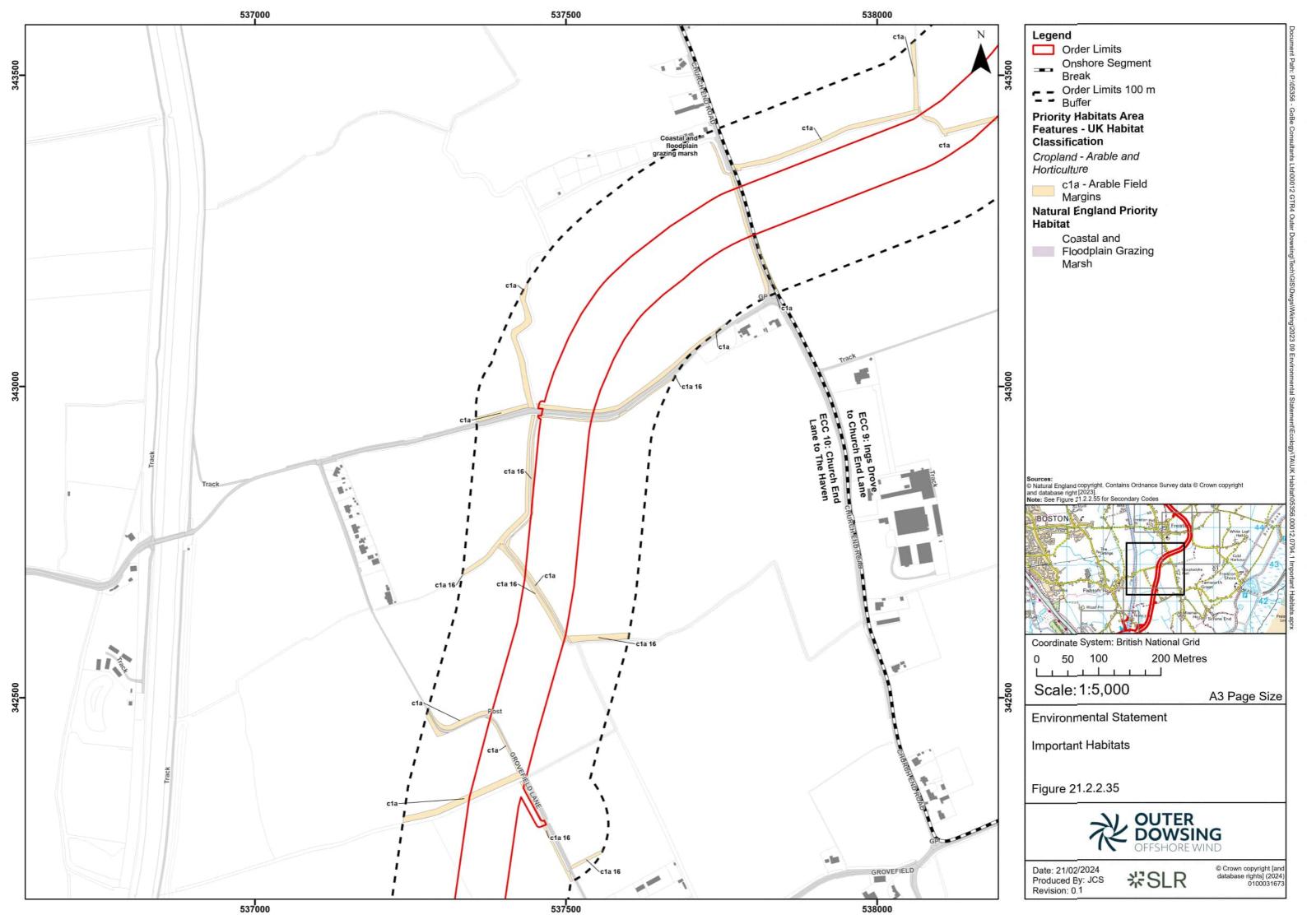


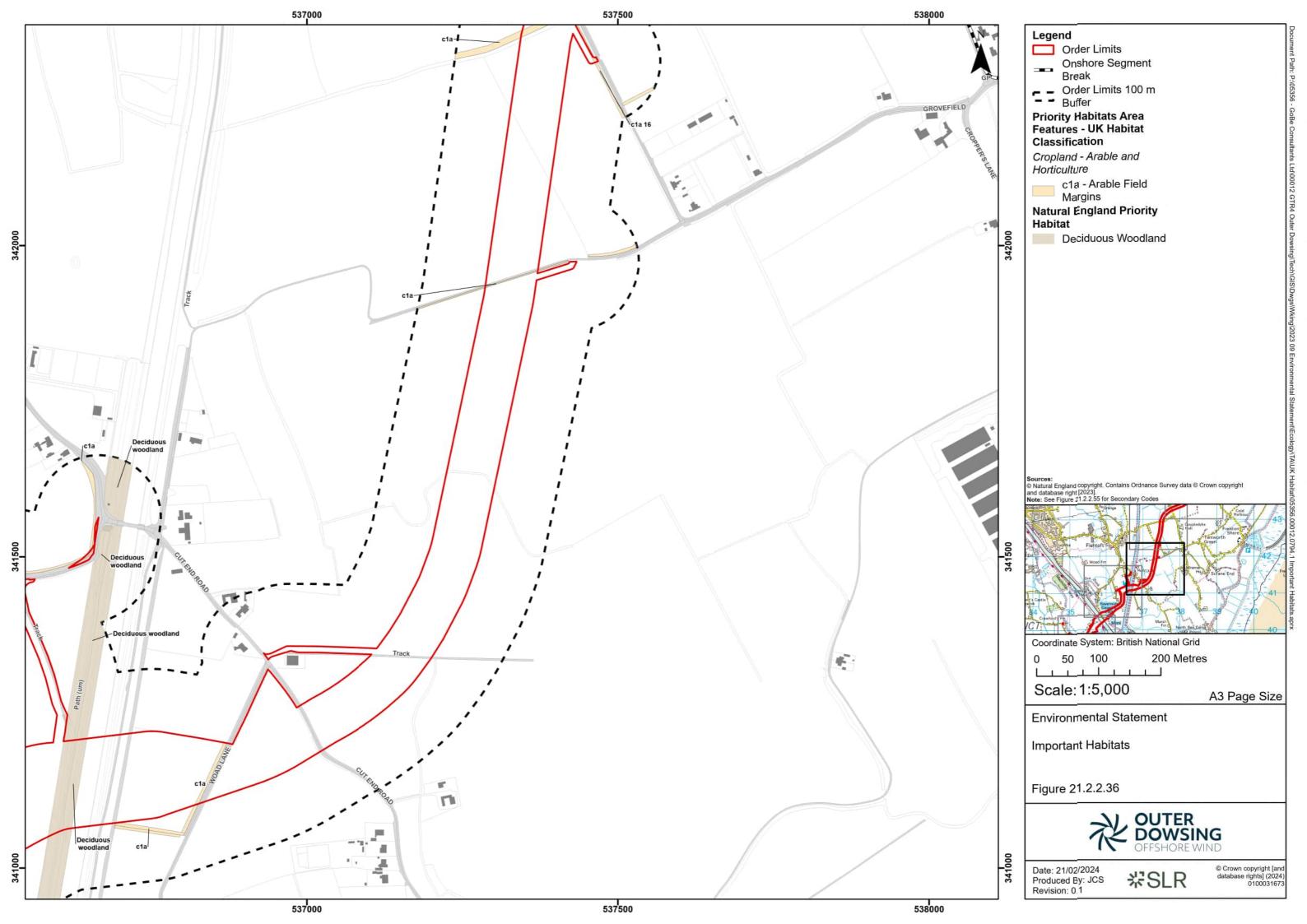


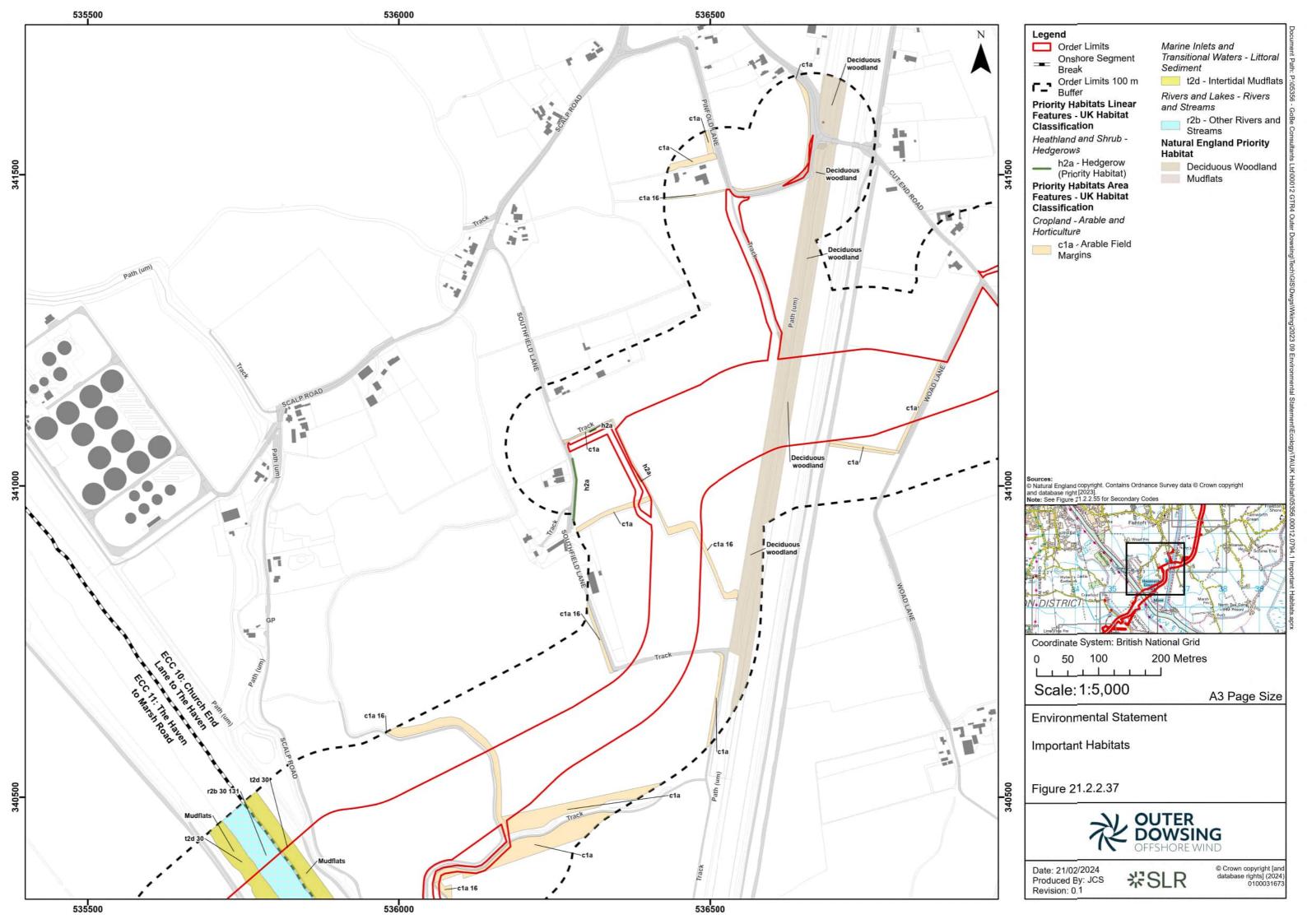


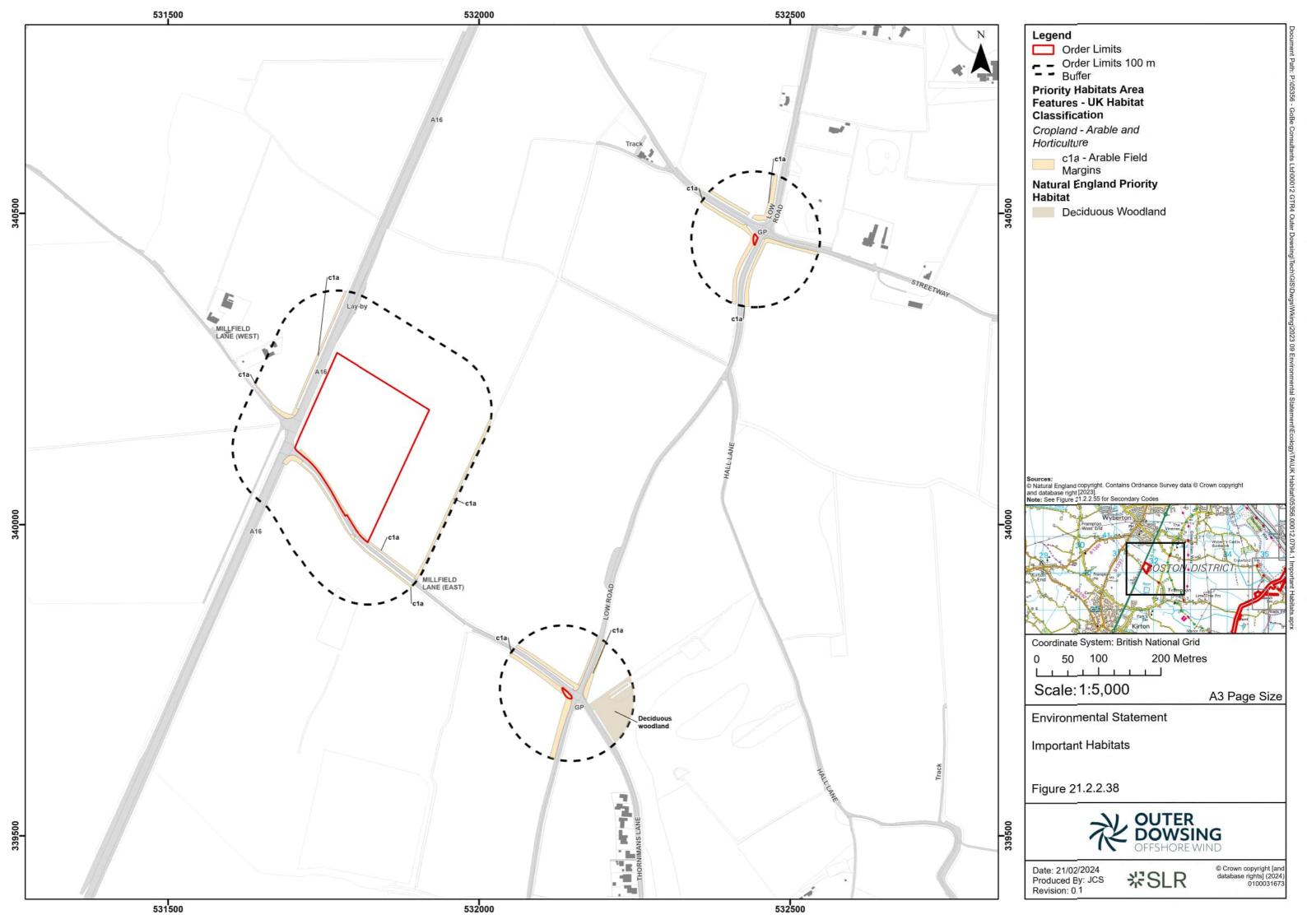


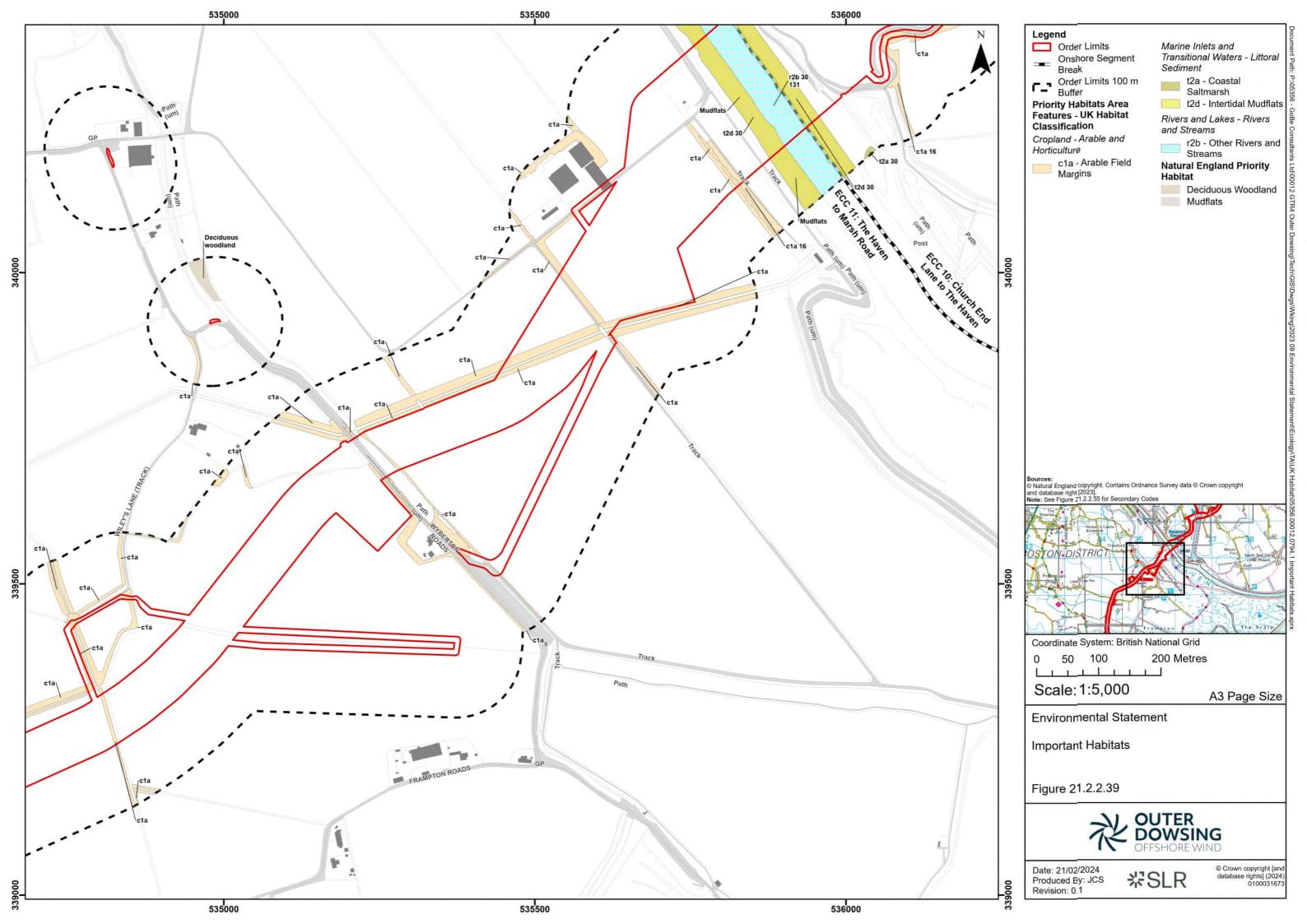


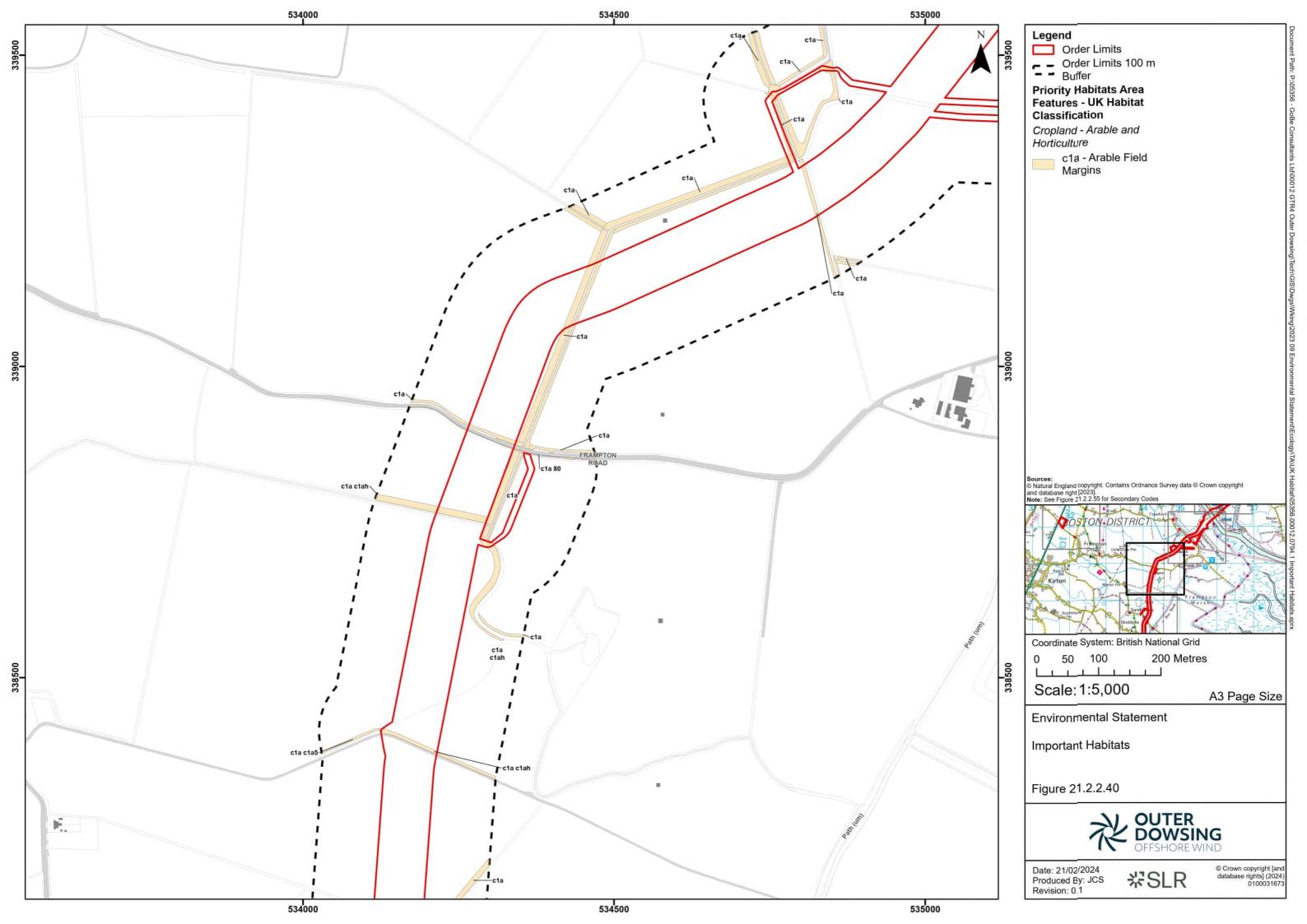


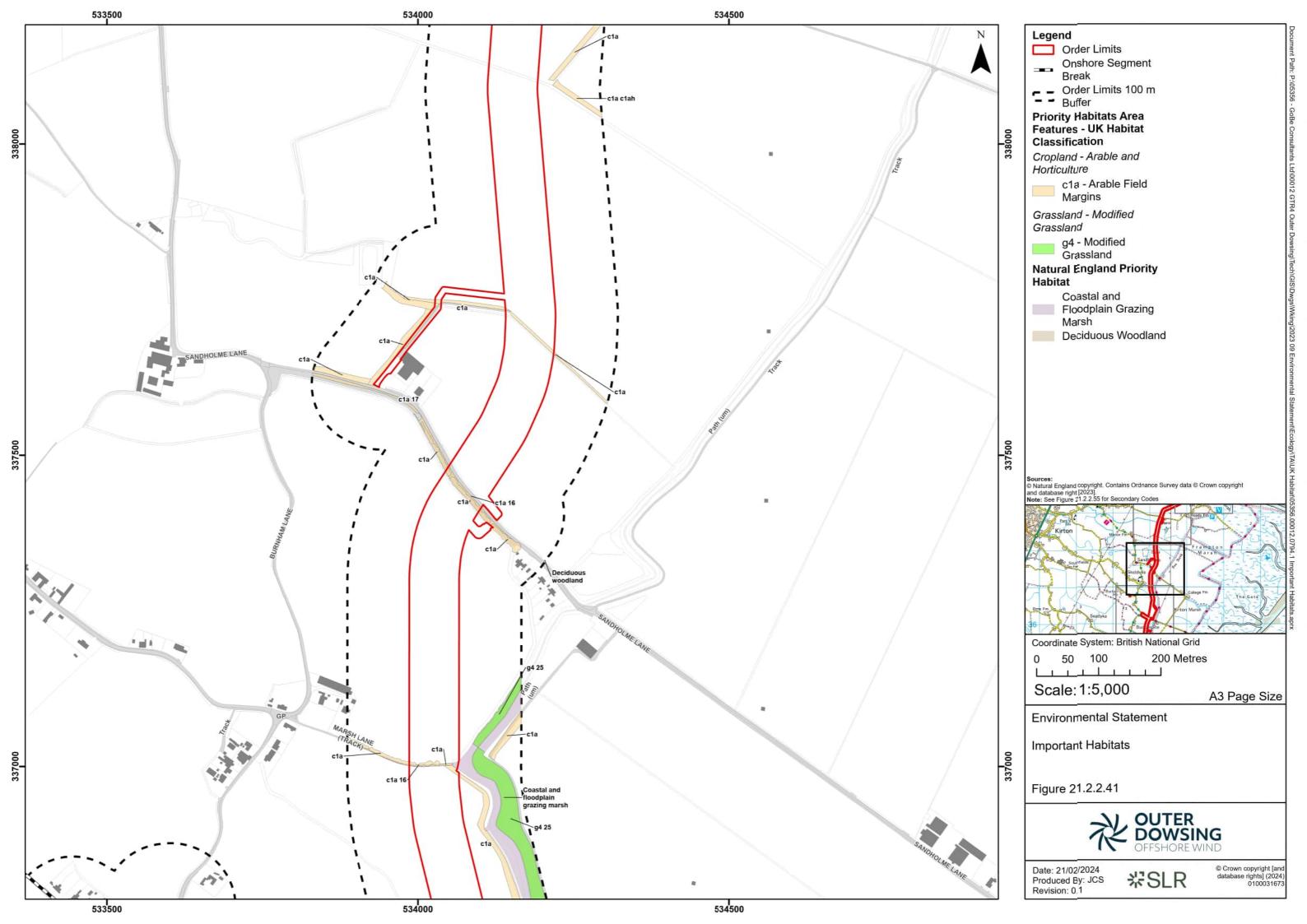


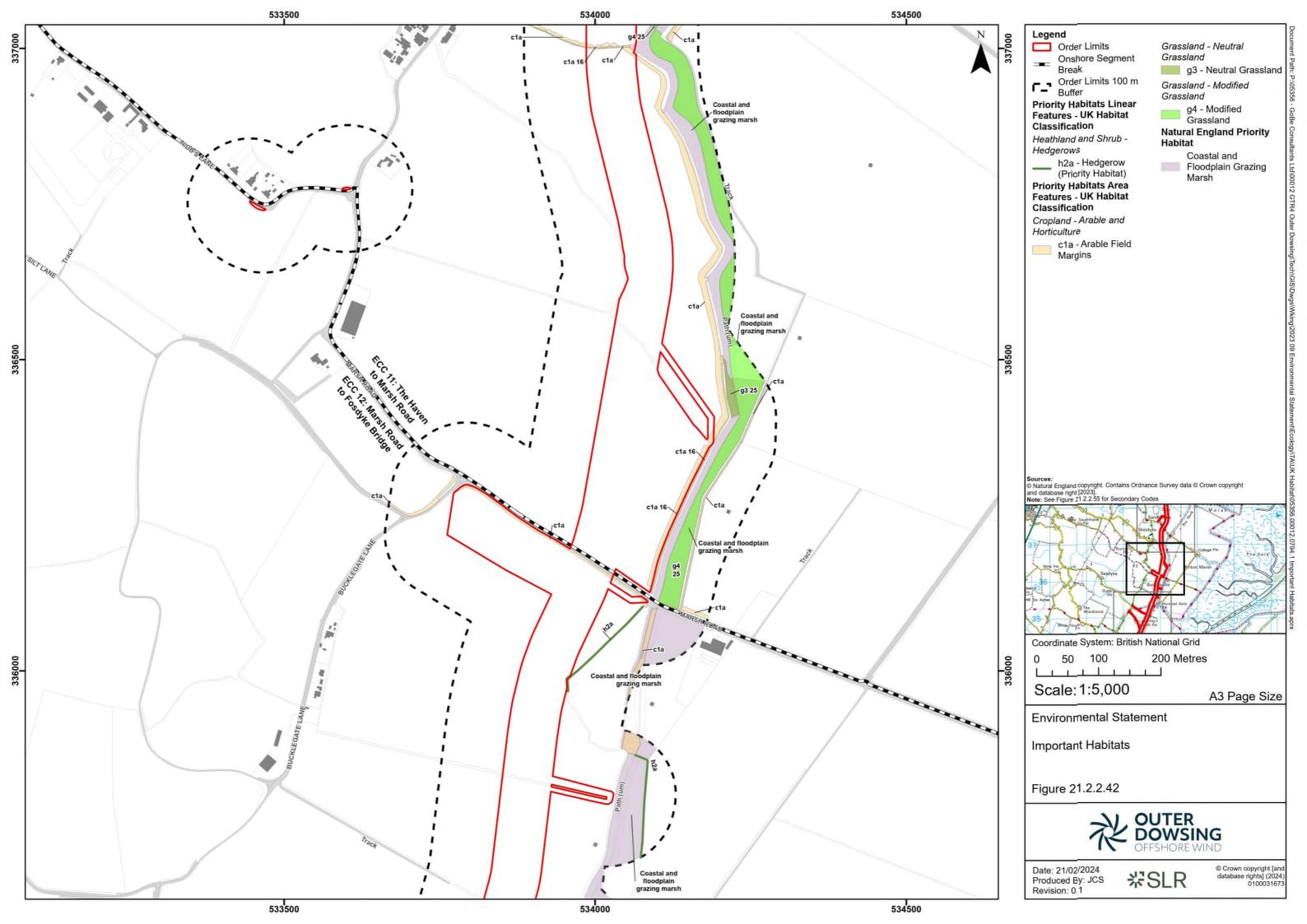


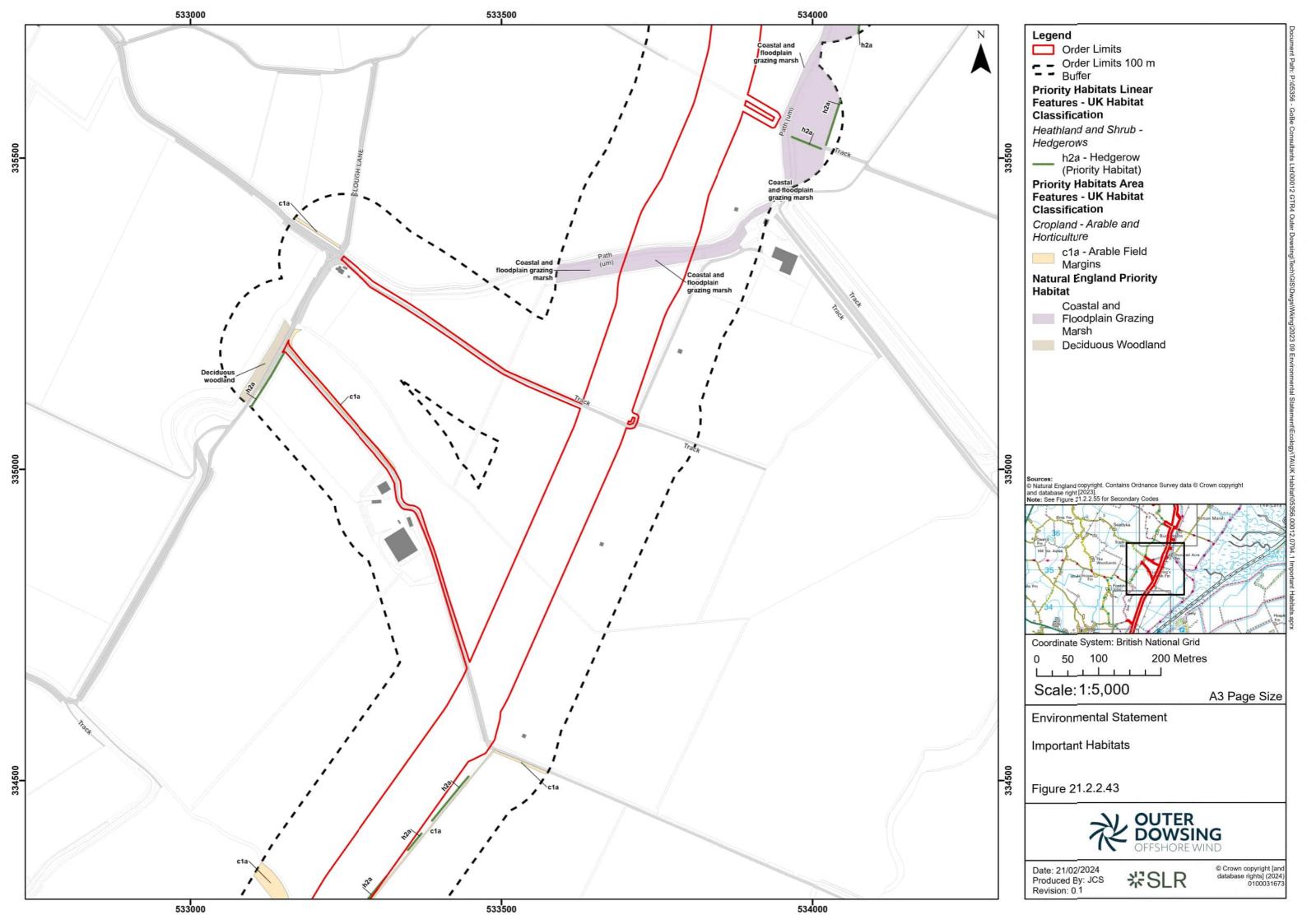


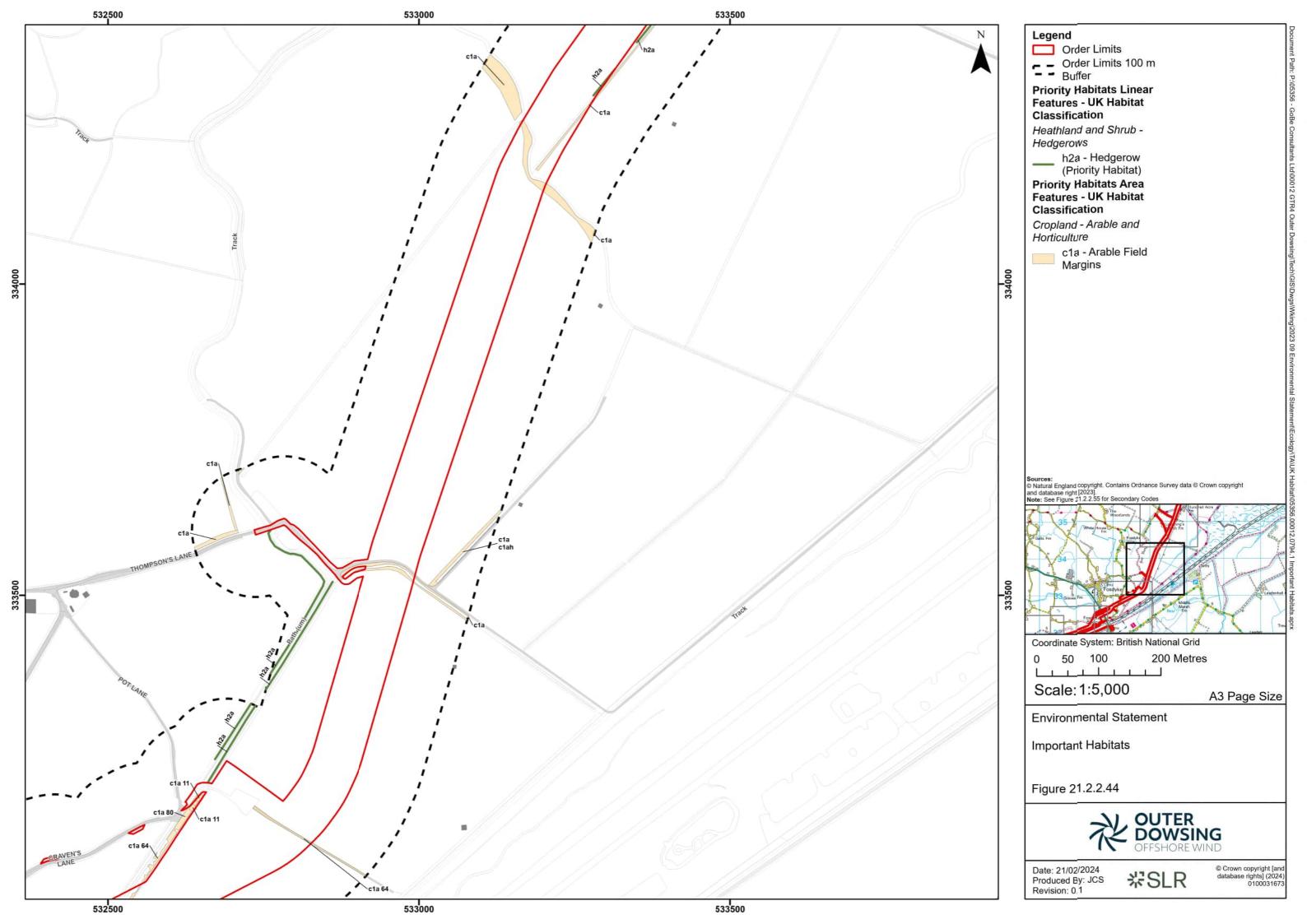


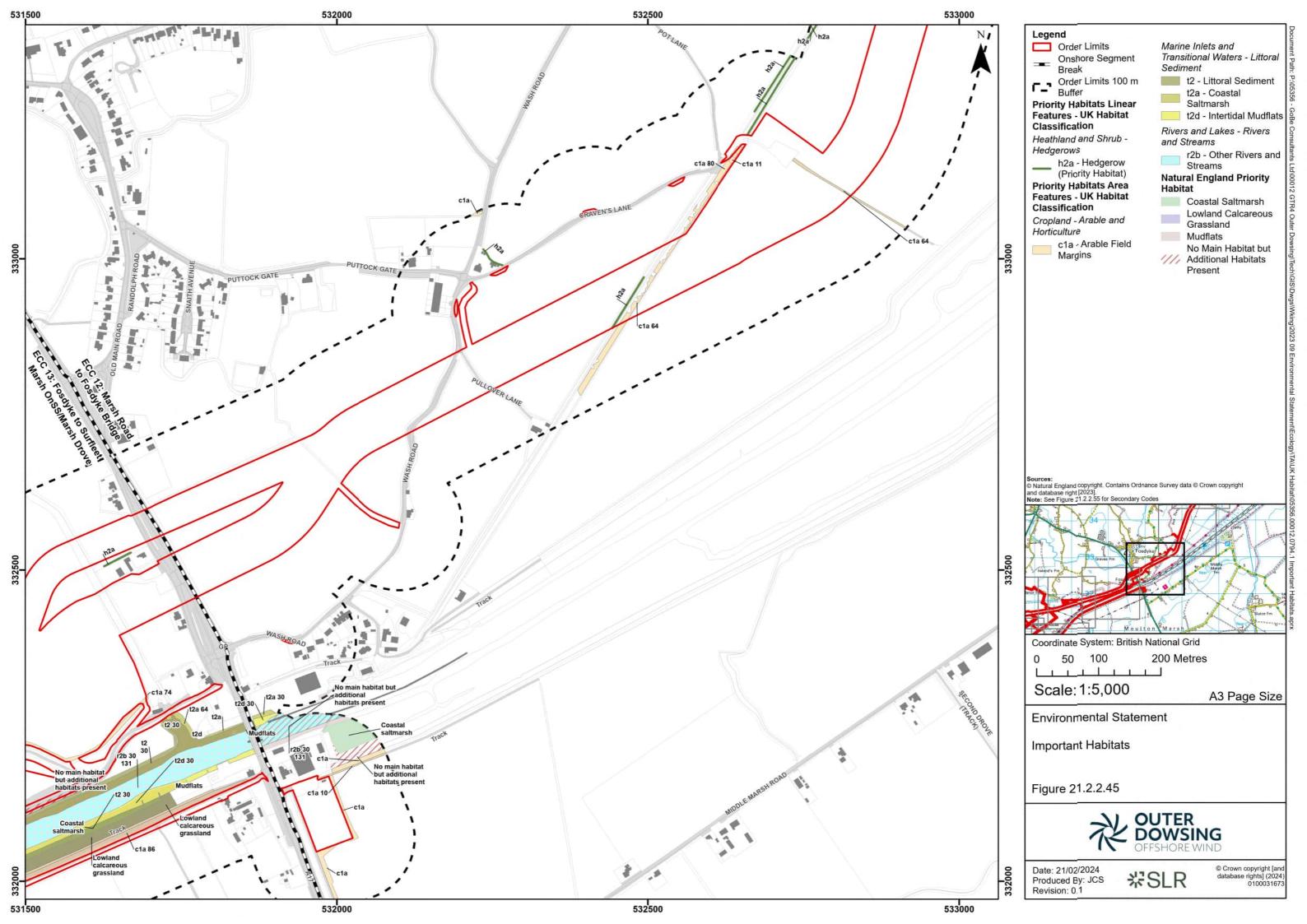


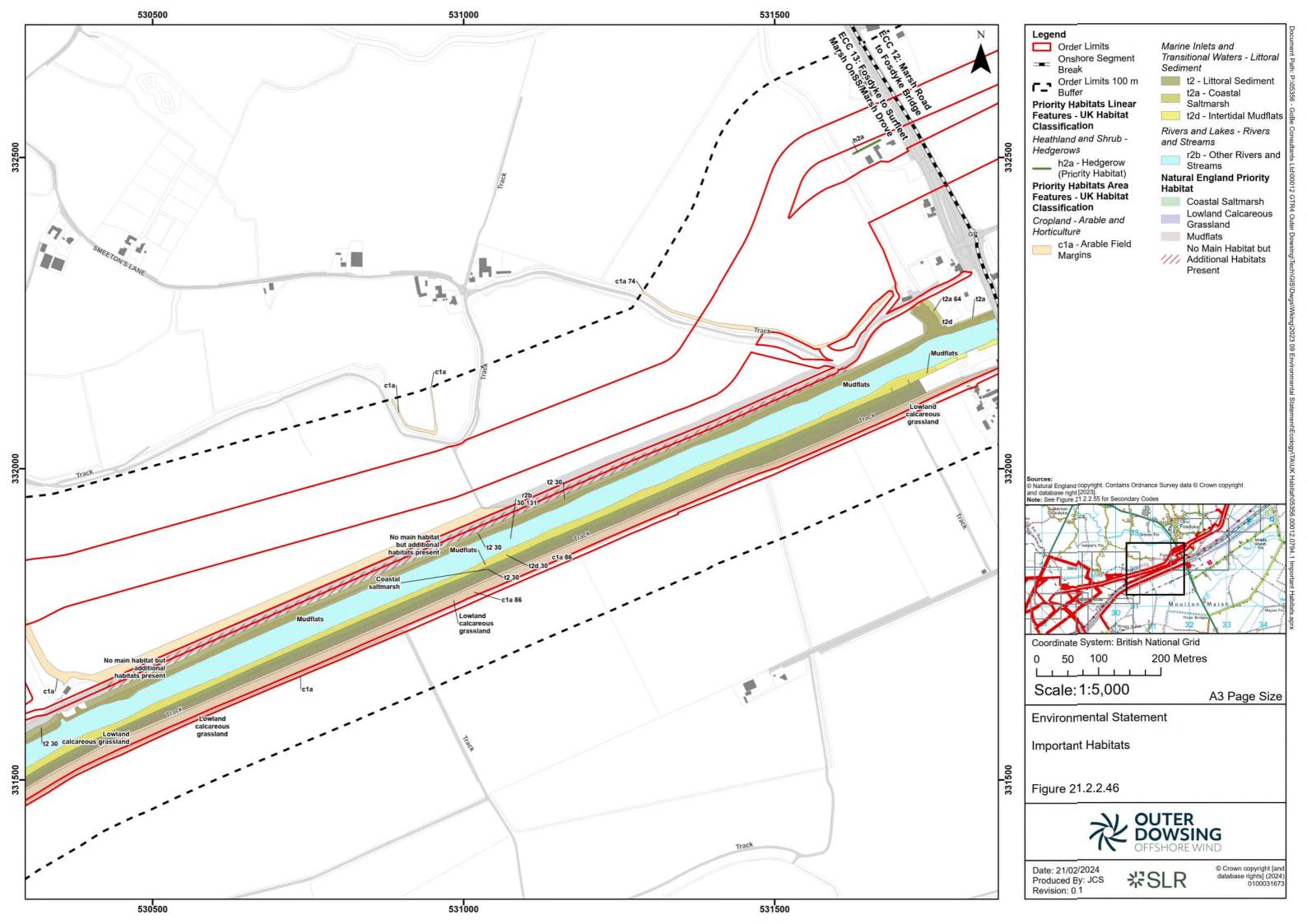


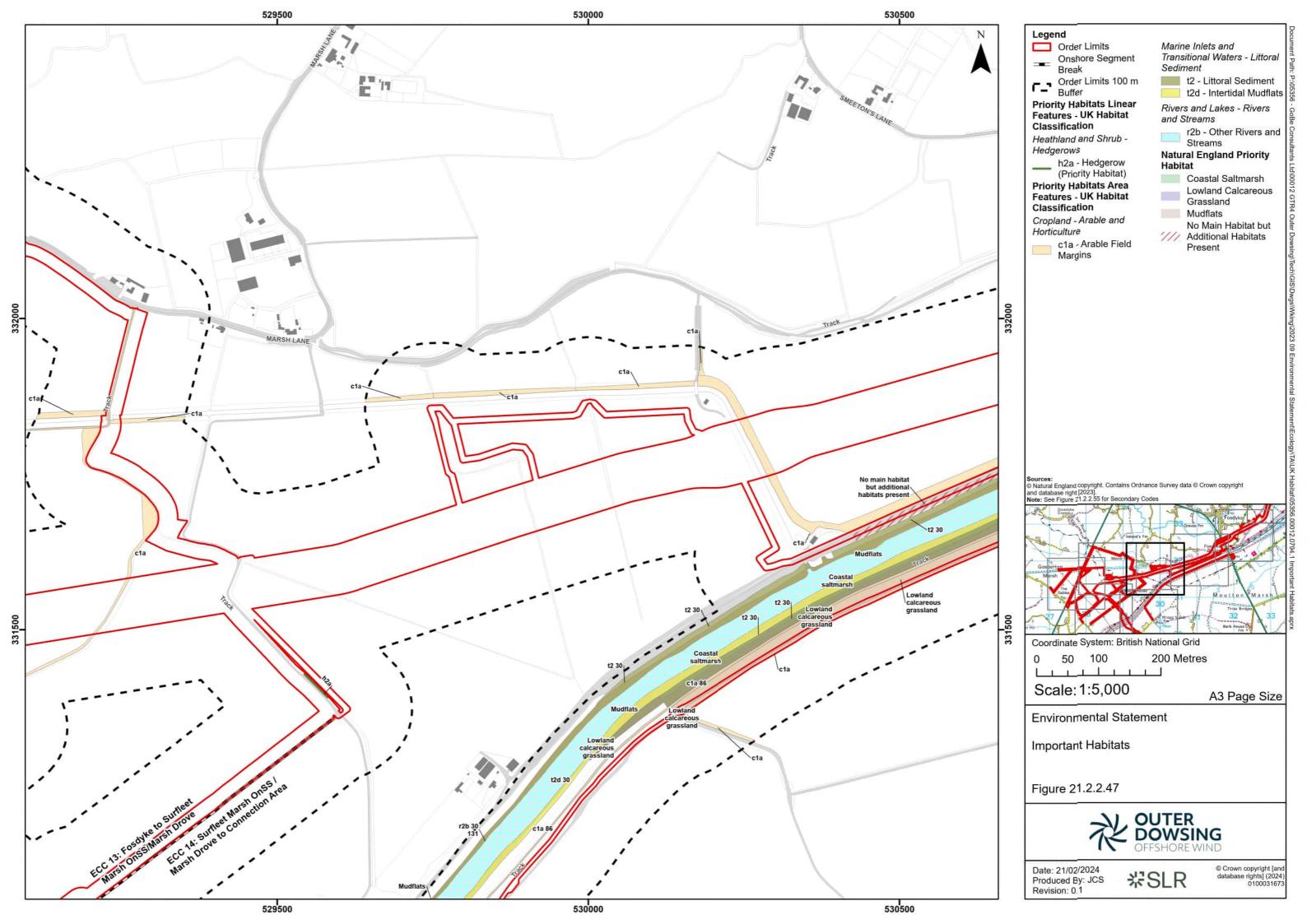


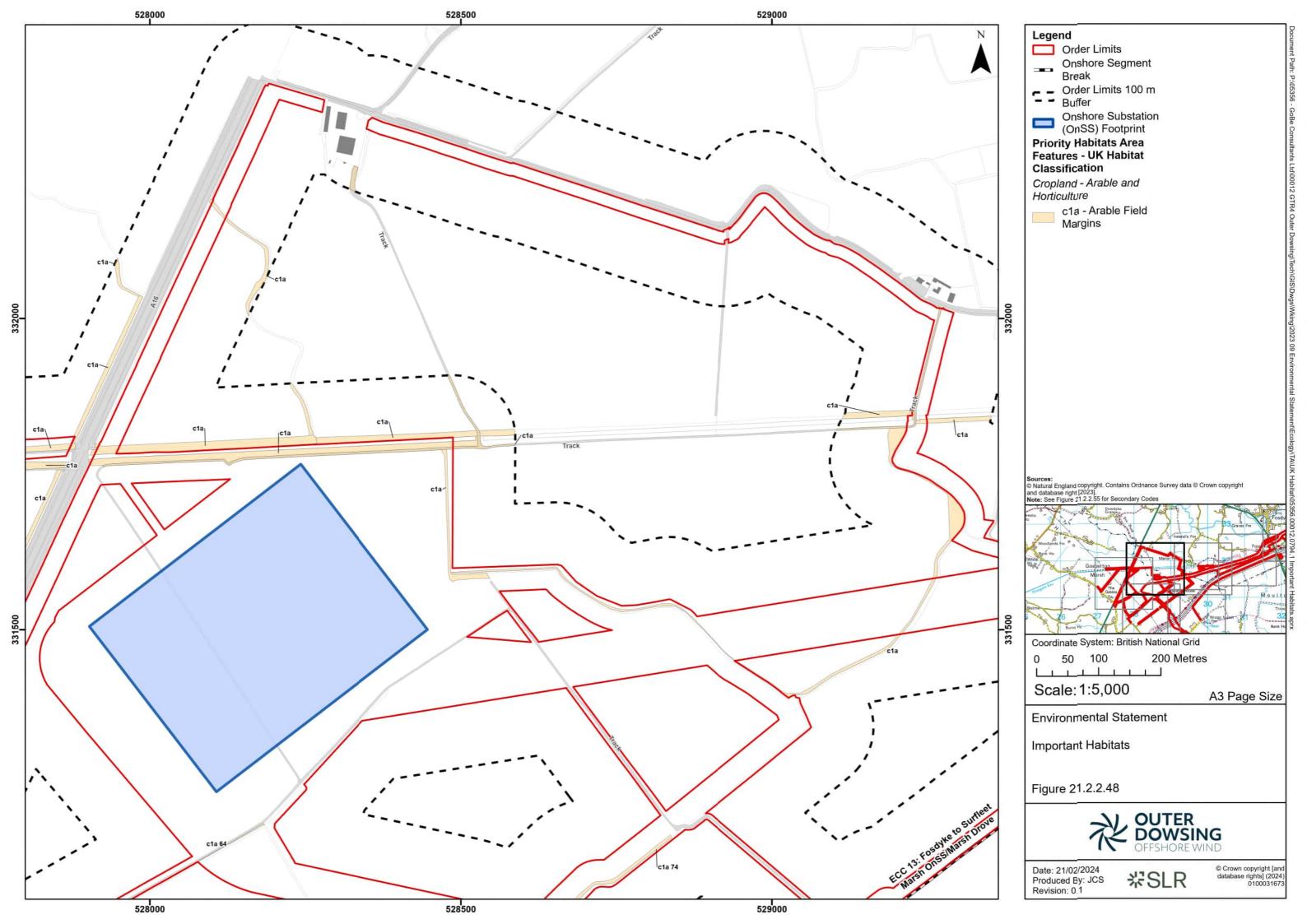


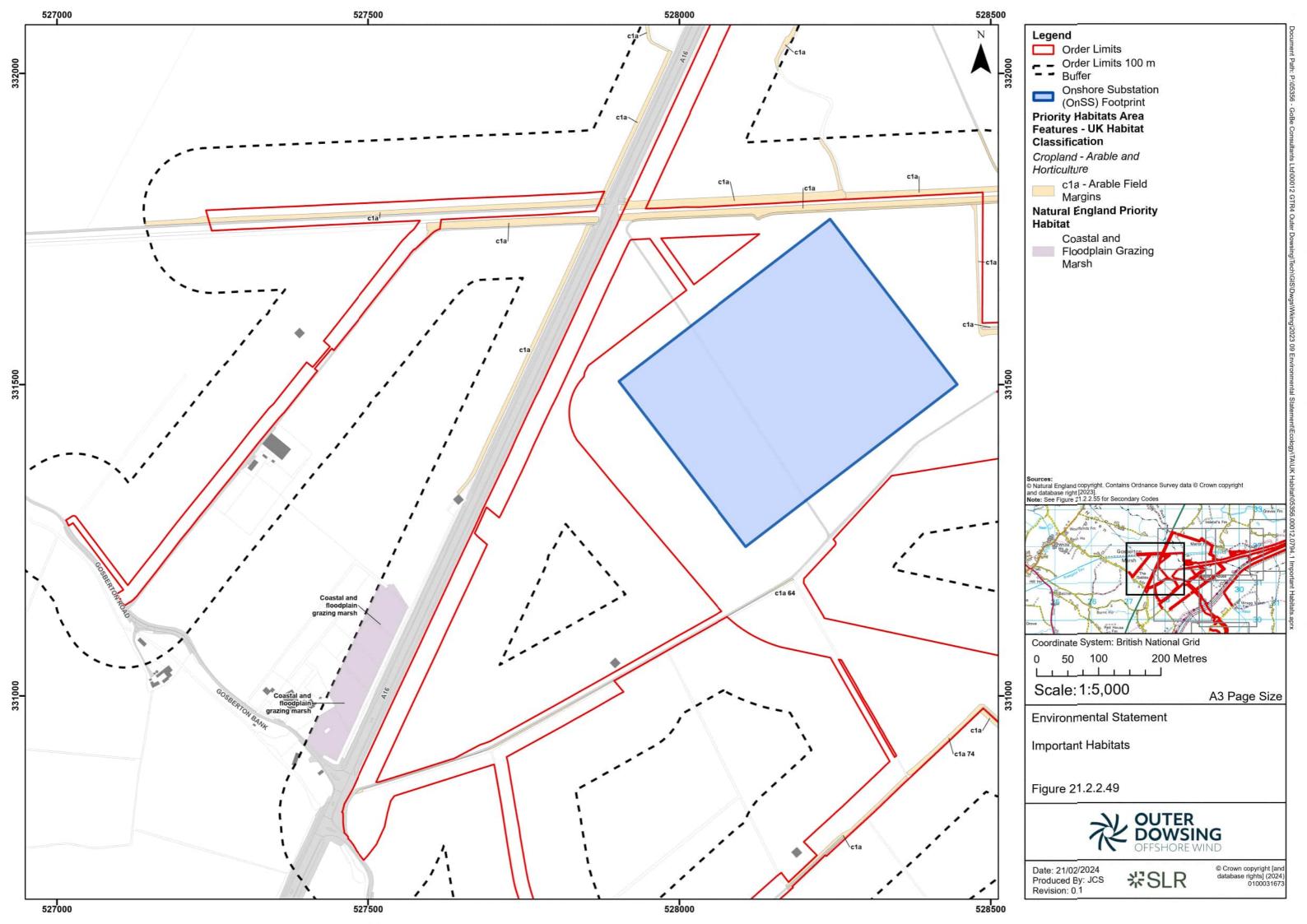


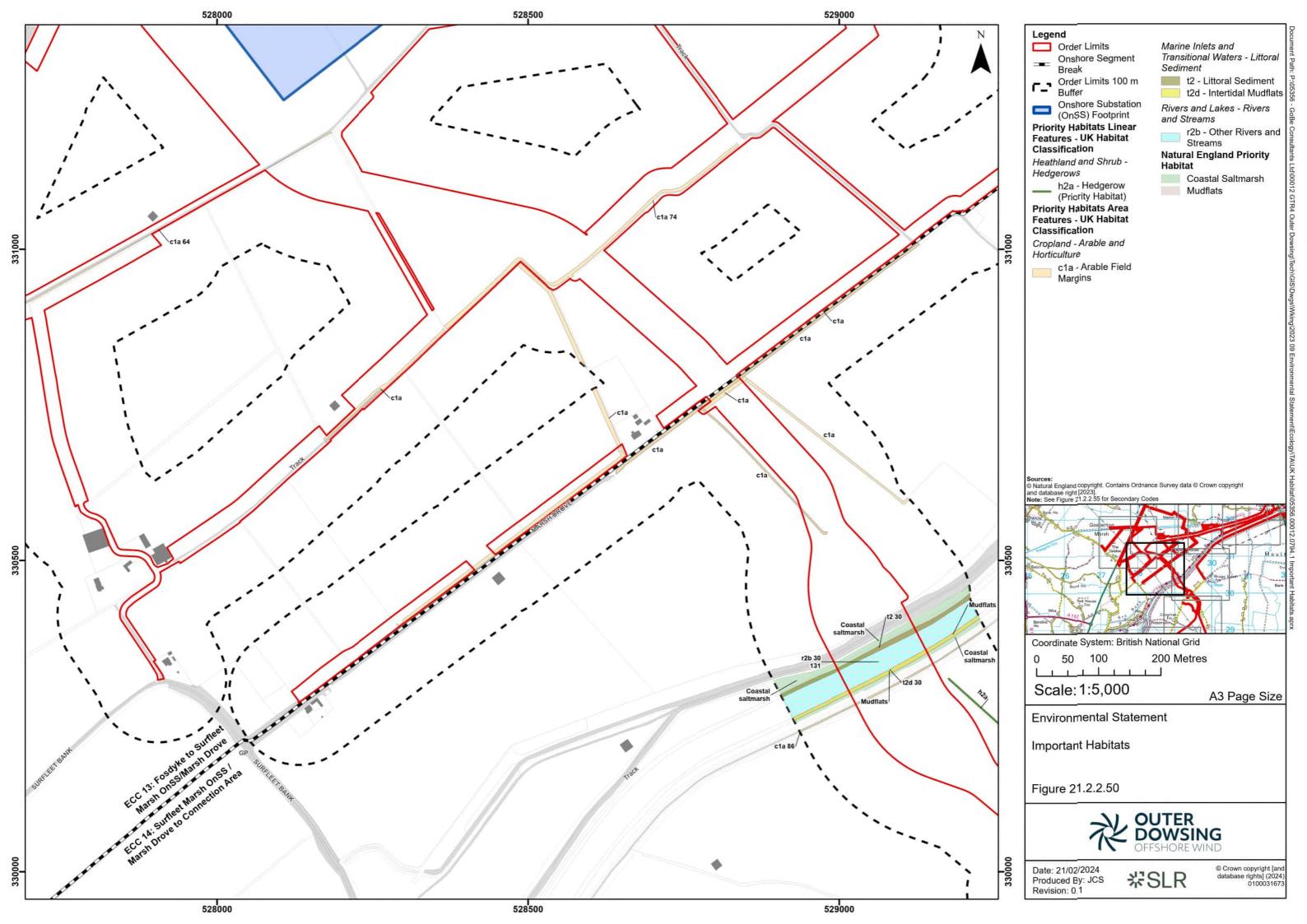


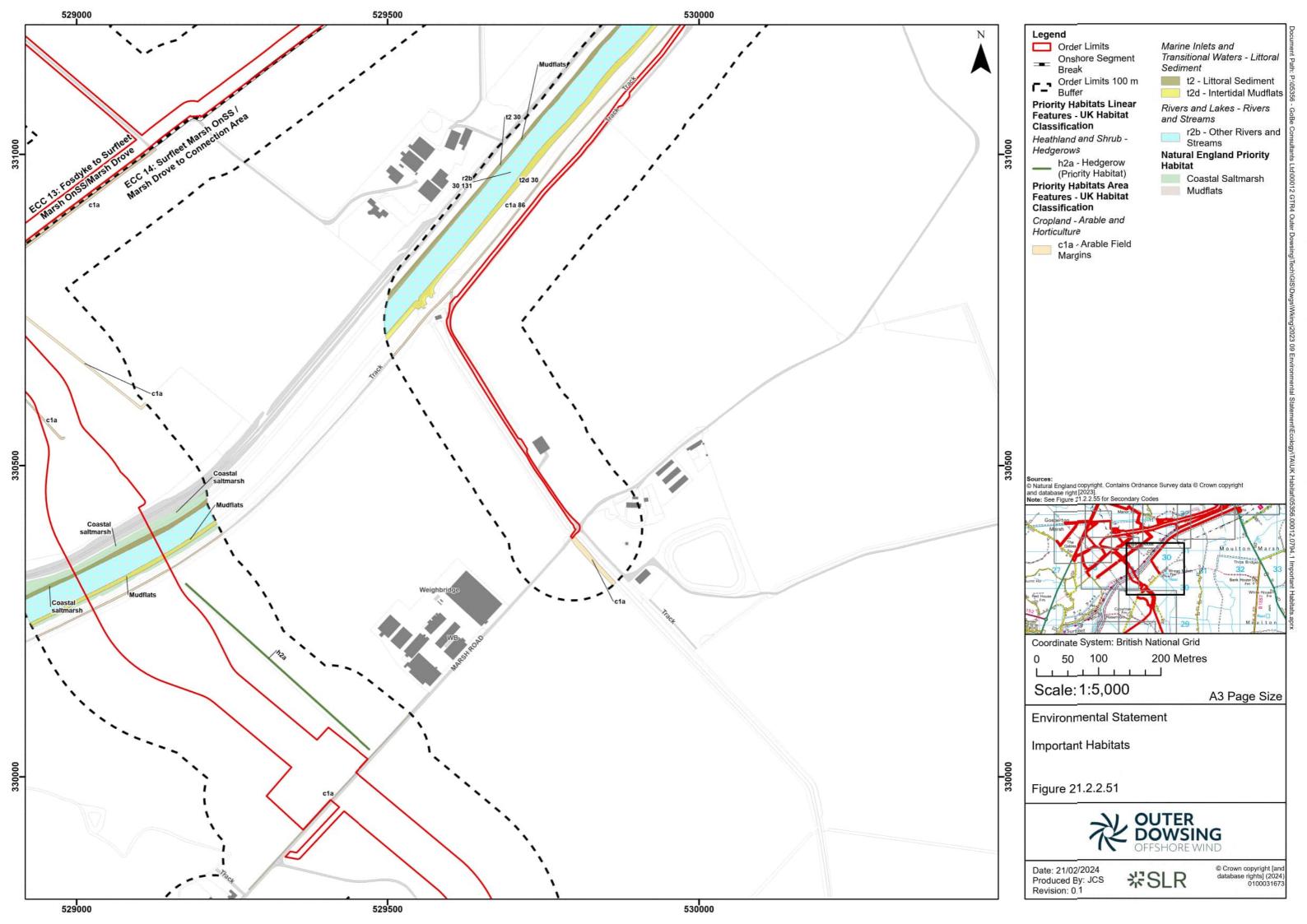


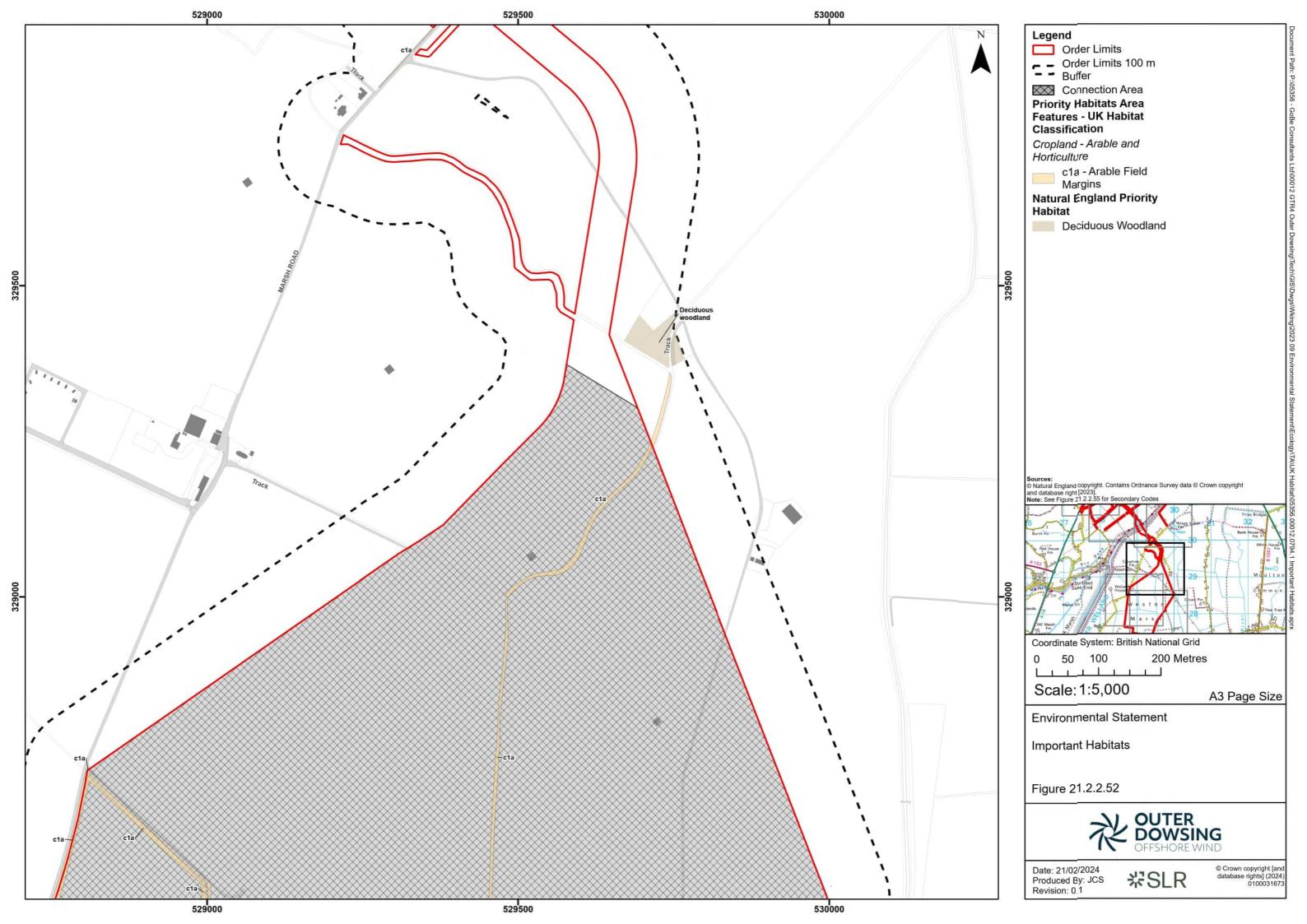


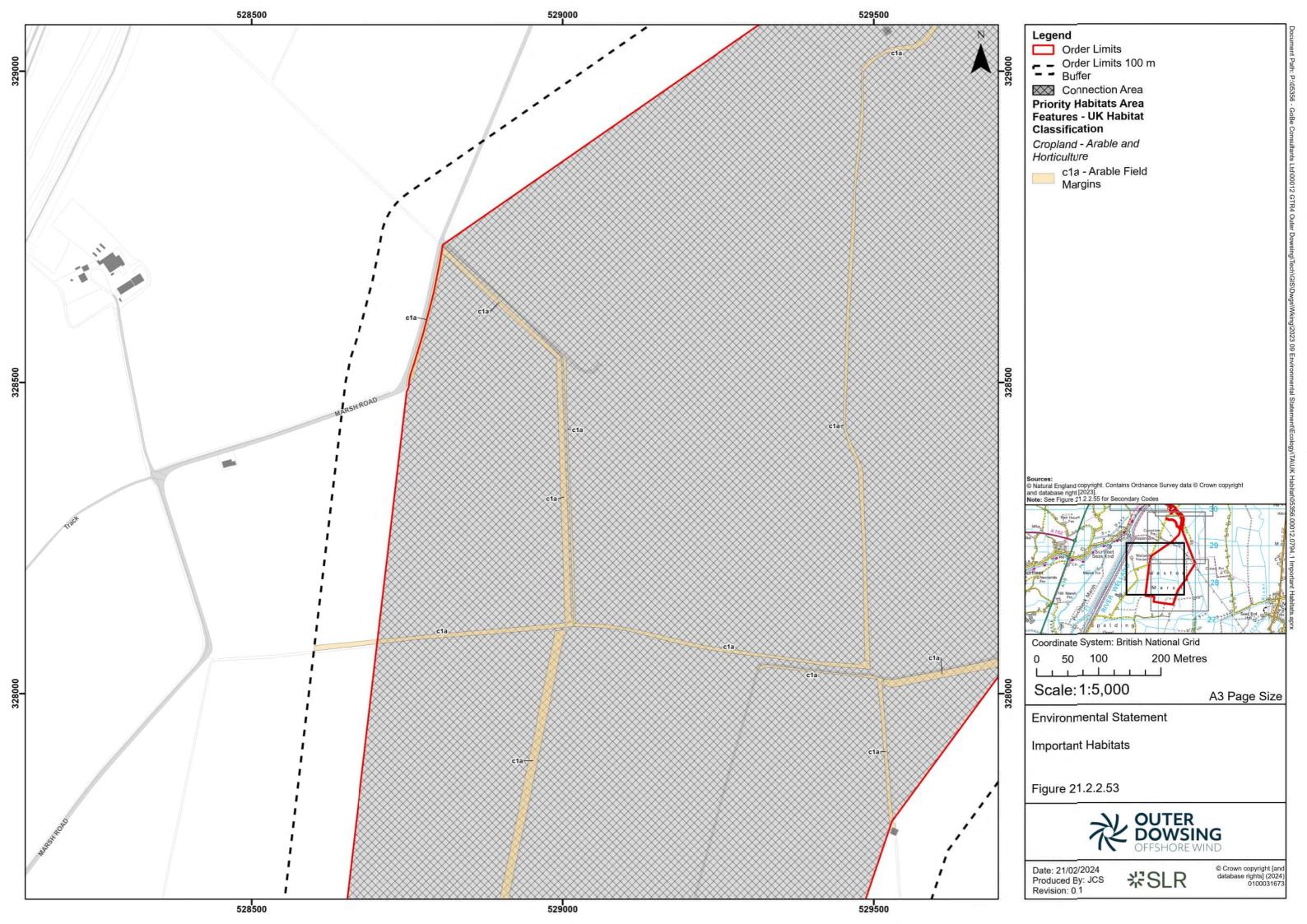


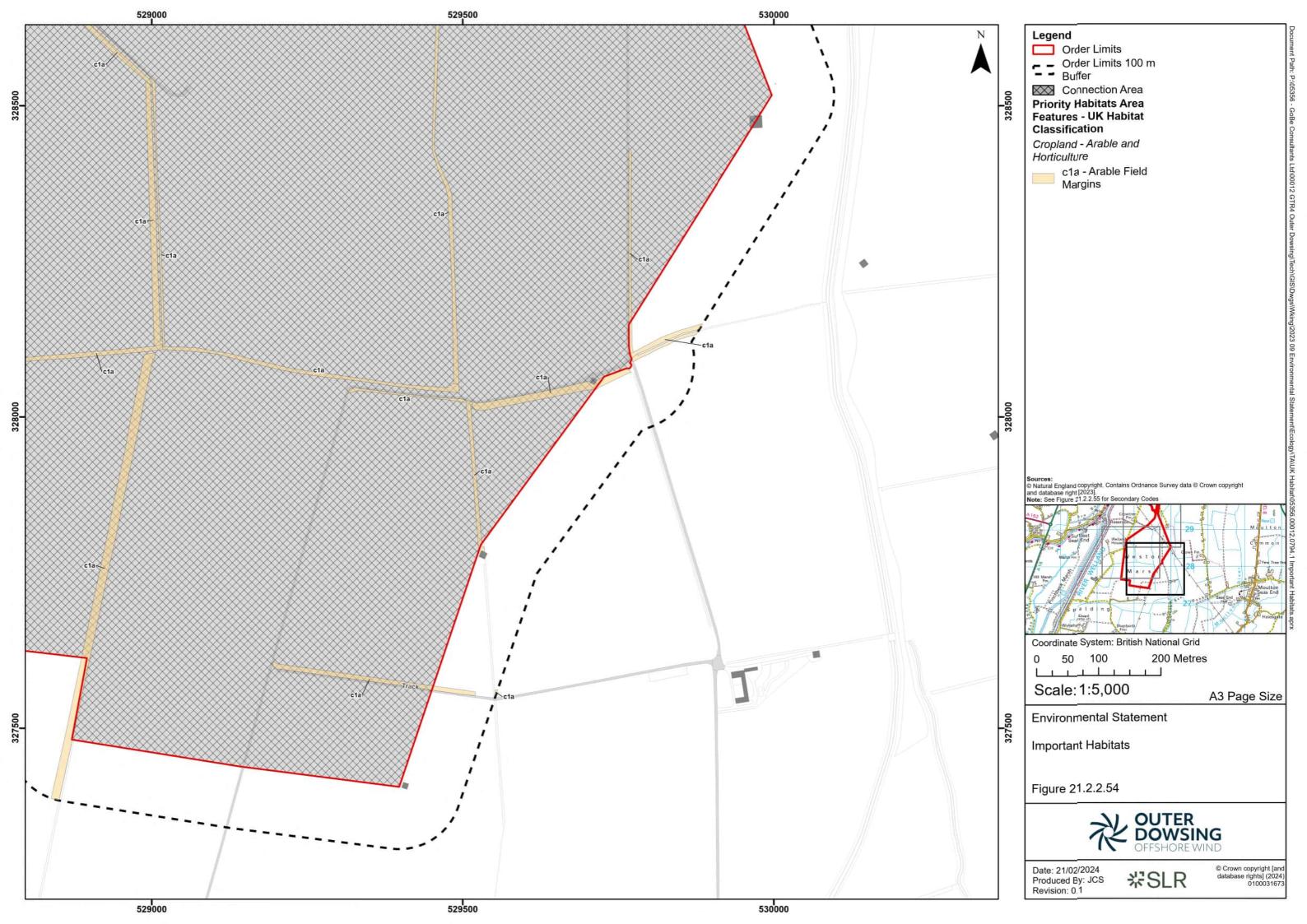












Secondary Codes

- 10 Scattered scrub
- **11** Scattered trees
- **14** Scattered rushes
- **16** Tall herb
- **17** Ruderal/ ephemeral
- 19 Ponds (Priority Habitat)
- 25 Coastal and floodplain grazing marsh
- **30** Estuaries (H1130)
- **36** Plantation
- **39** Freshwater man-made
- 41 Freshwater natural
- 58 Grazed
- **64** Mown
- **74** Ploughed
- **75** Active Management
- **76** Recent Management
- **80** Unmanaged
- **86** Accessible natural greenspace
- **161** Tall or tussocky sward
- **190** Hedgerow with trees
- **191** Ditch
- **361** Natural lake or pond
- 362 Artificial lake or pond

Environmental Statement

Important Habitats

Figure 21.2.2.55



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21.2 Legislation

10. A framework of international, European, national, and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. A summary of the key legislation of relevance to this report is provided in Table 21.2 below and the full list of legislation is provided within the ES, Volume 1, Chapter 21 Onshore Ecology (document reference 6.1.21) under Section 21.2 Statutory and Policy Context.

Table 21.2: Legislation and Policy Context

Legislation/Policy	Key Provision of Relevance to this Report
Conservation of Habitats and Species Regulations 2017 (as amended)	The Habitats Regulations cover the requirements for protecting sites that are internationally important for threatened habitats and species and sets out a legal framework for species requiring strict protection, including the protection of certain plant species.
Wildlife and Countryside Act 1981 (as amended)	Protection of certain plant species protected under Schedule 8. Guidance on section 14 which prevents certain nonnative plant species to grow or spread in the wild.
Natural Environment & Rural Communities (NERC) Act 2006	Section 41 of the Act requires the publication of a list of habitats and species which are of principal importance for the purpose of conserving biodiversity. The Section 41 list is used to guide authorities in implementing their duty to have regard to the conservation of biodiversity.
Hedgerow Regulations 1997	These regulations, enforced under the Environment Act 1995, restrict the removal of hedgerows deemed "important" hedgerows under ecological or historical criteria set out in the Regulations.
Invasive Alien Species (Enforcement and Permitting) Order 2019	These regulations, address the prevention and management of the introduction and spread of invasive alien species, of which includes 36 plant species.
National Planning Policy set out in the National Planning Policy Framework (NPPF) [10],	Policies relating to habitats and biodiversity set out in paragraphs 180 to 188.
	These policies are designed to protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen ecological networks.



1 March 2024 SLR Project No.: 410.V05356.00013

21.3 Methodology

21.3.1 Desk Study

- 11. Records of important habitats and notable plants were requested from Greater Lincolnshire Nature Partnership (GLNP) for all land within the Order Limits, plus a 2km buffer. This information was used to provide context for surveys and further detail is provided within the ES.
- 12. The MAGIC website was searched for priority habitats within the Order Limits plus a 100m buffer from it.
- 13. Full details of the desk study are reported in Volume 3, Appendix 21.1 Onshore Ecology Desk Study (document reference 6.3.21.1).

21.3.2 Field Survey

- 14. The field survey comprised three main elements:
 - mapping of habitats habitats were mapped using the UK Habitat Classification v1.1 (Butcher, et al., 2020), as agreed at the scoping stage, to capture the presence of Section 41 and Annex 1 habitat types. The presence of notable or invasive non-native plant species was also recorded during the habitat survey;
 - sufficient detail was gathered to determine if hedgerows that could be breached by the proposed development meet the definition of "important" under the Hedgerow Regulations (1997). Only a brief summary of the hedgerow results will be included within this report with full details provided in a separate hedgerow report (Volume 3, Appendix 21.3 Important Hedgerow Report (document reference 6.3.21.3).
- 15. In some instances, the methodology diverged from field survey elements listed above, predominantly where access was unavailable or limited to certain land parcels. Full details are provided in the Limitations Section 2.3.



21.3.2.1 2022 Initial Habitat Mapping

16. Initial identification and classification of areas of similar habitat (i.e., habitat polygons, linear features) was undertaken primarily via interpretation of aerial imagery in 2022, with additional ground-truthing of sample areas as reported in the PEIR (SLR Consulting, 2023b).

21.3.2.2 2022 - 2023 Habitat Mapping

- 17. Once more comprehensive access was gained to the survey area, each of the polygons identified from aerial interpretation was visited (where applicable to the survey area), and where necessary, remapped. Habitats were then classified in accordance with the UKHab Primary Hierarchy at the level most appropriate to the features being recorded. In general, all ecosystems have been identified to a Level 3 (Broad Habitat Type) habitat, with the majority of habitats being classified to Level 4 (further splits of Level 3 habitats inc. UK BAP Priority Habitats) or 5 (further splits of Level 4 habitats inc. Annex 1 habitats), where appropriate. Secondary Codes have been used to further describe habitats
- 18. Additional secondary codes, photographs and notes were recorded for the majority of polygons; these have been retained in a Geographical Information System (GIS) data database and due to the amount of data are not present in this report, they can however be supplied upon request. The most relevant/pertinent data and habitat records and features are included here, in particular for habitats deemed to be important ecological features.

21.3.3 Hedgerow Assessment

19. The habitat survey included the mapping and assessment of hedgerows that could be breached by the onshore elements of the Project. Hedgerows were also assessed under Schedule 1 Part II (6) of the Hedgerow Regulations 1997 (i.e., for wildlife and landscape reasons rather than archaeological or historical reasons), to determine if they were "important" as per these regulations. Full details are provided in a separate hedgerow report (Volume3, Appendix 21.3 Important Hedgerow Survey (document reference 6.3.21.3).



1 March 2024

21.4 Limitations

- 20. The optimal period for habitat survey is March September, inclusive. Due to project timelines, a number of preliminary surveys, ground-truthing and additional information were collected outside of this core survey period. The dates of all surveys and their extent and purpose has been recorded in SLR's habitat survey database. In total, across the full range of habitats surveyed within the survey area, the timing of the field surveys is not considered to represent a significant limitation to the habitat data collected. Nonetheless, it should be noted that some plant species (including non-native invasive species) may have been missed if not evidenced at the time of the survey due to their seasonal nature; and in June 2023, prolonged periods of dry weather resulted in some of the water bodies; namely ditches, drying up.
- 21. However, the points above are not considered to be a significant limitation as it was still possible to identify the majority of plants and seasonality of waterbodies in order to assess the habitat types which were present.
- 22. Access permission was not available for some land parcels within the study area. In these cases, records were made from the perimeter of accessible areas (i.e., other land parcels or PRoW) and/or through aerial mapping to identify the types of habitats present or likely to be present in these areas. In some instances, access was granted but cattle were present, limiting and/or prohibiting access to certain land parcels. Therefore, as above, habitat data records were made in the same way as listed above for areas with no granted access.
- 23. Where access was unavailable and detailed survey information was unable to be gathered, data collection diverged slightly from the methodology in Section Field Survey 2.2. This meant that the classification of Primary Habitats in these areas were classified at a higher level; Level 1 (Major Ecosystem) or Level 2 (Ecosystem Types).
- 24. For land parcels where either access was unavailable, detailed survey was not possible due to the time of year, lack of site information (i.e., whether arable field margins were managed specifically to provide benefits for wildlife) or survey type, a precautionary approach to certain habitats was implemented to ensure that potential Habitats of Principal Importance (HPIs) were not overlooked. In these instances, the following habitats and the specific approach taken is detailed below:



1 March 2024

- Arable Field Margins; herbaceous or grassland strips or blocks sited on the outer
 2-12m margins of an arable field were recorded under this Primary Habitat.
 Occasionally subsets of arable margins (non-HPI habitats) were also recorded;
- Coastal and Floodplain Grazing Marsh (CFGM); a combination of groundtruthing where possible, interrogation of aerial photography and information from Natural England's Priority Habitat Inventory from the MAGIC website was used.
 Pasture or neutral grassland types that were periodically inundated and contained ditches that maintained continual water levels were included as CFGM;
- Ponds; apart from great crested newt surveys (*Triturus cristatus*), no additional biological and environmental data has been collected from the ponds in order to completely rule out meeting the HPI criteria. Therefore, all ponds apart from temporary water bodies were recorded as Priority Habitat.
- 25. Some additional variations to the UKHab methodology were also implemented based on the scope and extent of the survey area. The fine-scale Minimum Mapping Unit (MMU) of 25m², 5m length was not appropriate and instead, secondary codes were used to their full potential to identify specific features within the larger Primary Habitats. Lastly, the UKHab guidance includes the mapping of linear features greater than 1m wide as polygons. However, due to the scale of the project and to ensure alignment with the Biodiversity Net Gain (BNG) standards, these were mapped as lines and the canopies incorporated into the adjacent Primary Habitats. This means that there will be a slight increase in habitat area for some Primary Habitats which abut hedgerows or lines of trees.
- 26. It should also be noted that the percentage totals of habitat areas may not accurately total 100% of the Order Limits due to some insignificant gaps or overlaps along the route from the National Tree Map (NTM) data that was used for woodlands. The gaps may also have arisen from geometry simplification required before uploading the data to ArcGIS Online in order to reduce the file size for the outputs. This is not considered to be a constraint as these percentages are given to indicate the proportionality of habitat types across the survey area for context.



1 March 2024 SLR Project No.: 410.V05356.00013

21.5 Determining Important Ecological Features

- 27. Ecological features can be important for a variety of reasons and the rationale used to identify them is explained below. Importance may relate, for example, to protected status, the quality or extent of the site or habitats therein; habitat and/or species rarity; the extent to which such habitats and/or species are threatened throughout their range, or to their rate of decline.
- 28. Important habitats are considered here to be those which:
 - match descriptions of habitats listed on Annex 1 of the Habitats Directive, so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017 (as amended);
 - match descriptions of Habitats of Principal Importance (HPIs) for biodiversity under Section 41 of the Natural Environmental and Rural Communities (NERC) Act 2006;
 - match Local Wildlife Site (LWS) Selection Criteria (GLNP, 2013);
 - match descriptions of habitats with Habitat Action Plans (HAPs) contained within Local Biodiversity Action Plans (BAPs) (Lincolnshire Biodiversity Partnership, 2011);
 - comprise irreplaceable habitats, such as (but not limited to) coastal sand dunes, ancient woodland, and veteran trees (Defra Land Use Policy Team, 2023 and Natural England, 2022); and/or;
 - comprise a significant habitat resource for an important species.



21.6 Results

21.6.1 Desk Study

21.6.1.1 Habitats

29. The MAGIC website returned records of priority habitats within the Order Limits and 100m buffer. The habitats and locations are referenced in Table Table 21.3 below. There were no priority habitat records within ECC 9, and it is therefore excluded from Table 21.3.

Table 21.3: MAGIC Records of Priority Habitats within the Order Limits and/or 100m Buffer

Priority Habitat Type (from NE Habitat Inventory)	ECC Segment(s) (Survey Area)
Coastal Sand Dunes	1
Reedbed	1
Coastal and Floodplain Grazing Marsh	2, 3, 4, 5, 8, 11, 12, 13
Deciduous Woodland	5, 6, 7, 10, 11, 14
Mudflats	10, 11, 13, 14
Coastal Saltmarsh	10, 12, 13, 14

- 30. Although priority habitat deciduous woodland was recorded, no records of Ancient and Semi-Natural Woodland (ASNW) or Plantations on Ancient Woodland Sites (PAWS) within the Order Limits and 100m buffer were returned by the desk study.
- 31. One record of Long-established woodlands of plantation origin (LEPO), Friskney Decoy Wood, is present within the 100m buffer at ECC 6. Many LEPO sites have developed semi-natural characteristics and may be as rich as Ancient Woodland.

21.6.2 Field Survey

32. The main ecosystems within the survey area, as described using the Level 2 UKHab Classification terminology, are cropland, grassland, heathland and shrub, rivers and lakes, sparsely vegetated ground, woodland and forest, wetland, urban habitats and marine inlets and transitional waters. Approximately 82.4% of the total land area is covered by cropland, grassland accounts for almost 10%, with heathland and shrub,



1 March 2024

SLR Project No.: 410.V05356.00013

rivers and lakes, sparsely vegetated ground, woodland and forest, wetland, urban habitats and marine inlets and transitional waters forming the remaining 7.5% percentage cover.

- 33. Habitat types within the survey area shown across Figures 21.2.1.1 21.2.1.53 (Habitat Plan), with primary and mandatory secondary UKHab codes stated. Important habitats (as defined in Section 3.2) are shown across Figures 21.2.2.1 21.2.2.55 (Important Habitats, including primary codes, mandatory secondary codes, plus additional secondary codes as appropriate).
- 34. General descriptions for the various habitats encountered, including illustrative photographs, are provided below along with reference to their distribution within the survey area. More detailed descriptions are provided for specific areas of Priority Habitat, where there was potential for Annex 1 habitat, locally important or rare species to occur. Data for all habitat polygons, including (in almost all cases) photographs and dominant/characteristic species are stored in a GIS database and can be made available upon request.

21.6.2.1 Cropland – Arable and Horticulture (c1)

35. The vast majority of the survey area surveyed is managed as arable agricultural land, predominantly cropland comprising cereal crops and non-cereal crops (Plate 21.1). In particular, Lincolnshire grows large amounts of barley, wheat, oilseed rape and sugar beet. Some arable fields recorded as ploughed or in winter stubble depending on the survey season. Cropland is present within each of the ECC 1 to ECC 14.



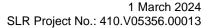




Plate 21.1: ECC 10 – A field of cereal crop, to the east of Haven River and Scalp Road, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)

- 36. Arable field margins (Plate 21.2) occur in numerous locations throughout the survey area and were recorded within each of the ECC 1 to ECC 14. These areas are usually sited on the outer 2-12m margins of an arable field, although they may also intersect it, and vary in vegetation structure between dominant tall ruderals and a mixture of grasses and herbaceous vegetation with intermittent scattered scrub and trees. Some areas may have been left as a buffer and/or specifically managed to increase its biodiversity and wildlife value and therefore could meet the criteria for Habitats of Principal Importance (HPI). Arable field margins which are not specifically managed for wildlife are like to have a lower plant species diversity, however they will still have value for ground-nesting birds and invertebrates. It was unknown at the time of writing as to whether any of the areas are part of an Environmental Stewardship Scheme or similar programme.
- 37. Species noted to occur within the arable field margins include, but are not limited to; false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), *Bromus sp.*, *Alopecurus sp.*, tall fescue (*Festuca arundinacea*), meadow grasses (*Poa sp.*), red fescue (*Festuca rubra*), Timothy grass (*Phleum sp.*), Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), cow parsley (*Anthriscus sylvestris*), common



UK Habitat Classification Survey SLR Project No.: 410.V05356.00013

hogweed (Heracleum sphondylium), common knapweed (Centaurea nigra), creeping buttercup (Ranunculus repens), bulbous buttercup (Ranunculus bulbosus), common mouse-ear (Cerastium fontanum), scented mayweed (Matricaria chamomilla), red campion (Silene dioica), Geranium sp., hedge mustard (Sisymbrium officinale), yarrow (Achillea millefolium), oxeye daisy (Leucanthemum vulgare), common vetch (Vicia sativa), meadow vetchling (Lathyrus pratensis), hedge woundwort (Stachys sylvatica), tansy (Tanacetum vulgare), rosebay willowherb (Chamaenerion angustifolium), docks (Rumex sp.), cleavers (Galium aparine), garlic mustard (Alliaria petiolate), bristly oxtongue (Helminthotheca echioides), yellow rattle (Rhinanthus minor), common nettle (Urtica dioica), horseradish (Armoracia rusticana), pineappleweed (Matricaria discoidea), white clover (Trifolium repens), ribwort plantain (Plantago lanceolata), greater plantain (Plantago major), shepherd's purse (Capsella bursa-pastoris), creeping thistle (Cirsium arvense), spear thistle (Cirsium vulgare), oilseed rape (Brassica napus), bracken (Pteridium aquilinum), hawthorn (Crataegus monogyna) and blackthorn (Prunus spinosa).





Plate 21.2: ECC 10 – Arable field margin between two fields, to the east of Grovefield Lane, Freiston, Boston, Lincolnshire (Photograph taken June 2023)

38. A single field was planted with a game bird mix within ECC 2. Depending on the type of species, cover mixes can provide seed for wild birds throughout the winter and spring which is often a time when food resource is scarce as opposed to areas sown with maize that are of a much lower value for wild birds.

21.6.2.2 Modified Grassland (g4)

- 39. Modified grassland (Plate 21.3) was recorded within ECC 1 to ECC 14. These areas include the provision of habitat and food for grazing livestock (Plate 21.4) including cows, sheep, horses and poultry, hay or silage production, amenity areas around fishing lakes, a putting green, go-cart track, farm and residential buildings and gardens, and along ditches, farm tracks and frequently mown road verges.
- 40. This grassland is typically dominated by a few species and in this instance notably; perennial ryegrass, false oat-grass, *Bromus sp., Poa sp.,* Yorkshire fog, creeping bent (*Agrostis stolonifera*), *Trifolium sp.,* alsike clover (*Trifolium hybridum*), creeping buttercup, red fescue, cock's-foot, common nettle, *Cirsium sp.,* cow parsley, common hogweed, oxeye daisy, common dandelion (*Taraxacum officinale*), broad-leaved dock, common



1 March 2024 SLR Project No.: 410.V05356.00013

chickweed (Stellaria media), Rumex sp., ribwort plantain, greater plantain, pineappleweed, black medick (Medicago lupulina), common ragwort (Jacobaea vulgaris),

pineappleweed, black medick (*Medicago lupulina*), common ragwort (*Jacobaea vulgaris*), common daisy (*Bellis perennis*), meadow vetchling (*Lathyrus pratensis*), scented mayweed, garlic mustard, bristly oxtongue, prickly sow-thistle (*Sonchus asper*), hedge woundwort, common mugwort (*Artemisia vulgaris*), *geranium sp.*, cleavers, common wheat (*Triticum aestivum*), and occasional bramble (*Rubus fruticosus*), hawthorn, dog rose (*Rosa canina*), and *Salix sp.*



Plate 21.3: ECC 5 – Modified grassland, to the east of Church Lane, Croft, Skegness, Lincolnshire (Photograph taken June 2023)





Plate 21.4: ECC 12 – Sheep Grazed modified grassland, south of Marsh Road, Kirton, Boston, Lincolnshire (Photograph taken March 2023)

- 41. Coastal floodplain grazing marsh (CFPGM) (Plate 21.5) is a HPI that can include modified grassland (UKHAB g4) where drainage ditches occur, and the grassland is periodically flooded or has a high-water table. Although typically botanically poor, flooded g4 grassland can represent important feeding areas for wintering wildfowl. CFPGM (g4) occurs occasionally within the survey area within ECC 1, ECC 5, ECC 6, ECC 11 and ECC 12 and consists of agriculturally improved, periodically flooded pasture with ditches, typically grazed by cattle. These areas are a mixture of short and long turf with occasional areas of tussocky grasses, some of which may provide potential bird nesting habitat. No unimproved CFPGM was recorded within the survey area.
- 42. The CFPGM (g4) areas above correspond with the CFPGM habitats recorded on MAGIC at ECC 5, ECC 11 and ECC 12.
- 43. Some of the CFPGM (g4 and g3) areas present within ECC 1 to the north of Sea Bank Clay Pits SSSI, form one of the three 'target' areas; Anderby/Huttoft (a small coastal strip



between Sutton on Sea and Chapel St. Leonards) for the Lincolnshire Coastal Grazing Marshes (LCGM) Project¹.



Plate 21.5: ECC 1 – Coastal Floodplain Grazing Marsh (g4) to the east of Roman Bank Road, Skegness, Lincolnshire (Photograph taken July 2023)

21.6.2.3 Neutral Grassland (g3)

- 44. Neutral grassland (Plate 21.6) was recorded within each of the ECC 1 to ECC 14. Some grassland was classified at a higher level (g); Level 1 (Major Ecosystem) due to access limitations, however, given the types of habitats recorded on site this is likely to be either neutral or modified grassland.
- 45. Fields of neutral grassland occur infrequently within the survey area with the remaining areas present in strips around field edges, hedgerows, woodland, watercourses, standing open water, farm and residential buildings and gardens, recreational sites (i.e., around putting greens, leisure parks) and along road verges.

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¹ https://www.lincsmarshes.org.uk/assets/downloads/MASTER_LCAP_compressed.pdf

- 1 March 2024 SLR Project No.: 410.V05356.00013
- 46. The neutral grassland within the survey area is mostly tussocky with scrub and infrequent rushes, sedges and reeds in the wetter areas. Typically, these areas are not particularly species-rich as they receive some "improvement" from drainage, fertilisers and other management, however, they are far richer than modified grassland such as pasture and leys. These areas are likely to be important for invertebrates and breeding and wintering birds.
- 47. Some of the grassland was classified as Arrhenatherum neutral grassland (g3c5) where false oat-grass was dominant in the sward which occurs occasionally within ECC 5 to ECC8.
- 48. Plant species recorded were very similar to the species composition listed for arable field margins. Additional species included; curled dock (*Rumex crispus*), white dead nettle (*Lamium album*), silverweed (*Argentina anserina*), common reed (*Phragmites australis*), common sow thistle (*Sonchus oleraceus*), nipplewort (*Lapsana communis*), common groundsel (*Senecio vulgaris*), red dead nettle (*Lamium purpureum*), hedge bindweed (*Calystegia sepium*), bittersweet (*Solanum dulcamara*), meadowsweet (*Filipendula ulmaria*), dove's-foot cranesbill (*Geranium molle*), reed canary grass (*Phalaris arundinace*), red clover (*Trifolium pratense*), autumn hawkbit (*Scorzoneroides autumnalis*), bird's-foot trefoil (*Lotus corniculatus*) and vetch sp.





Plate 21.6: ECC 5 – Neutral grassland, south of the Wainfleet Relief Channel and Weir Dike, Skegness, Lincolnshire (Photograph taken August 2023)

49. Coastal floodplain grazing marsh (CFPGM) (Plate 21.7) is a HPI that can include neutral grassland (UKHAB g3) where drainage ditches occur, and the grassland is periodically flooded or has a high-water table. CFPGM (g3) occurs occasionally within the survey area within ECC 1 to ECC 5 and ECC 11 and comprises periodically flooded pasture with ditches, typically grazed by cattle, similarly to the modified grassland habitat described above, although there is a higher species diversity.





Plate 21.7: ECC 2 – Coastal Floodplain Grazing Marsh (g3) to the west of Sloothby High Lane, Manor Farm, Hogsthorpe, East Lindsey, Lincolnshire (Photograph taken January 2023)

- 50. The CFPGM (g3) areas above correspond with the CFPGM habitats recorded on MAGIC at ECC 2 to ECC 5 and ECC 11.
- 51. Green Lanes are located within ECC 10 to the west of the Hobhole Drain and ECC 12 southeast of Thomson's Lane (Plate 21.8) and Craven's Lane. These habitats occur infrequently within the survey area and contain sheltered neutral grassland habitats, some of which have escaped improvement and retained semi-natural features. These areas are often far richer in wildlife then standalone hedgerows because of the shelter and protection that they provide.





Plate 21.8: ECC 12 – Green Lane between linear scrub, southeast of Thompson's Lane, Fosdyke, Boston, Lincolnshire (Photograph taken September 2023)

21.6.2.4 Woodland and Forest (w)

- 52. Woodland is relatively sparse within the survey area and was recorded within ECC 1 to ECC 14, comprising numerous small copses and narrow belts of woodland with occasional larger areas of broadleaved, mixed, plantation (including coniferous) and rarely occurring wet woodland. Priority habitat lowland mixed deciduous woodland and wet woodland is present in three locations. Of these, lowland mixed deciduous woodland is present in ECC 3 (approximately 350m², Figure 21.2.2.11) and ECC 6 (approximately 0.8ha, Figure 21.2.2.19) and a small area of wet woodland (approximately 58m², Figure 21.2.2.4) is present in ECC 1.
- 53. The largest areas of woodland within the survey area are described in Table 21.4 below.

Table 21.4: Main Woodlands within the Order Limits and 100m Buffer

Woodland Name	Location and ECC Segment	Description
Unnamed woodland	TF 51431 61083 ECC 5	Other lowland mixed deciduous woodland, secondary (w1f7 38)



Woodland Name	Location and ECC Segment	Description
	100m buffer	Species include field maple (<i>Acer campestre</i>), silver birch (<i>Betula pendula</i>), pedunculate oak (<i>Quercus robur</i>), dog rose (<i>Rosa canina</i>) and occasional hawthorn.
		Woodland management was evidenced by tree felling in several areas and stacks of log piles.
		Included in the MAGIC Priority Habitat Inventory - Deciduous Woodland (England).
Unnamed woodland	TF 50382 60600 ECC 5	Broad-leaved mixed and yew woodland, plantation, and secondary woodland (w1 36 38)
	100m buffer	Not fully accessible. From aerial mapping going back to 2002, trees planted in rows can clearly be seen in the northern section with older secondary woodland in the south. From observations around the perimeter the woodland was predominantly broadleaved, interspersed with occasional coniferous trees and up to four native tree and shrub species were identified.
Unnamed woodland	TF 48411 59170 ECC 5	Broad-leaved mixed and yew woodland, secondary woodland (w1 36)
	100m buffer	Within a private residence and therefore not accessible.
	room sanoi	From aerial mapping going back to 2002, it appears that trees have been planted around the pond and hedgerow boundary in the north, some of this looks to be overgrown and the canopy touches a coniferous line of trees along the eastern boundary.
Unnamed	TF 48460 58830	Other broadleaved woodland types, plantation (w1g7 36)
woodland	ECC 6 100m buffer	The middle section of woodland was planted earlier, and the perimeter was planted later with two distinct age classes apparent. It lacks understorey woody vegetation with sparse grasses and mosses forming the ground cover.
		Species include Cherry (<i>Prunus sp.</i>), hawthorn, silver birch, oak, ash (<i>Fraxinus excelsior</i>), lacks understorey.
Unnamed	TF 47910 58450	Other broadleaved woodland types, plantation (w1g7 36)
woodland	ECC 6	A relatively uniform planted woodland with one distinct age
	100m buffer	class, woody understorey species are absent and ground cover is limited.
		Species include ash, field maple, holly, hazel, oak, hawthorn, silver birch, and <i>prunus sp.</i>
Unnamed woodland	TF 47570 58590	Other broadleaved woodland types, plantation (w1g7 36)
	ECC6	A relatively uniform planted woodland.
	100m buffer	Species include, pedunculate oak, silver birch, ash, guelder rose (<i>Viburnum opulus</i>), dogwood, cherry (<i>Prunus sp.</i>) and holly (<i>Ilex aquifolium</i>).
Friskney Decoy Wood	TF 46450 57100 ECC 6	Other woodland; mixed; mainly broadleaved, plantation, secondary woodland (w1h5 36 38)



Woodland Name	Location and ECC Segment	Description
	100m buffer	Managed by the Lincolnshire Wildlife Trust which describe it as a woodland and relict decoy pond and pipes, which fell out of use in 1878. Some woodland has grown naturally but most of the trees have been planted. This falls into the category of Long-established woodlands of plantation origin (LEPO),
		Species mostly consisting of silver birch, sycamore (<i>Acer pseudoplatanus</i>), Scots pine (<i>Pinus sylvestris</i>), with rowan (<i>Sorbus aucuparia</i>), alder (<i>Alnus glutinosa</i>), <i>Salix sp.</i> , aspen (<i>Populus tremula</i>), larch (<i>Larix decidua</i>), spruce (<i>Picea abies</i>), Corsican pine (<i>Pinus nigra</i>). Ground flora included bluebell (<i>Hyacinthoides non-scripta</i>) and snowdrop (<i>Galanthus nivalis</i>) were also recorded.
		Included in the MAGIC Priority Habitat Inventory - Deciduous Woodland (England).
Unnamed woodland	TF 45110 55550 ECC 7	Broad-leaved mixed and yew woodland, plantation, and secondary woodland (w1 36 38)
	100m buffer	Within a private residence and therefore not accessible.
		From aerial mapping going back to 2006, trees planted in rows can be clearly seen across much of the area, with older, semi-natural secondary woodland along the perimeter.
		Included in the MAGIC Priority Habitat Inventory - Deciduous Woodland (England).
Unnamed	TF 40650 51400	Other woodland; mixed; mainly conifer, plantation (w1h6 36)
woodland	ECC 8	Trees planted in distinct rows with two age classes.
	100m buffer	Species include Scots pine, oak, elder (Sambucus nigra).
Unnamed woodland	TF 38990 50160 ECC 8 100m buffer	Broad-leaved mixed and yew woodland, plantation, and secondary woodland (w1 36 38)
		Within a private residence and therefore not accessible.
		From aerial mapping going back to 1999, it appears to be a combination of planted trees and successional scrub to secondary woodland.
Unnamed	TF 36620 41210	Other woodland mixed, secondary woodland (w1 38)
woodland	ECC 10 Order Limits and 100m buffer	A mixture of trees and successional scrub just tall enough to be categorised as woodland (>5m height) along the western bank of the Hobhole Drain. The scrub layer was dense and impenetrable in places therefore a full species list was not possible.
		Species include hawthorn, blackthorn, elder, dog rose and bramble.
		Included in the MAGIC Priority Habitat Inventory - Deciduous Woodland (England).
Unnamed woodland within	TF 36060 40280 ECC 10	Other broadleaved woodland types, planted (w1g7 36)



Woodland Name	Location and ECC Segment	Description
Havenside Local Nature Reserve (LNR)	100m buffer	Although not planted in succinct rows, the age and distance between the trees suggest it was predominantly planted with some occasional natural regeneration.
		Species include oak, ash and hawthorn.
Unnamed woodland	TF 32550 33030 ECC 12	A belt of broadleaved trees (w1) and scrub (h3), 1,250m long running approximately NE-SW along an historic bank and ditch feature (visible on OS One Inch 1885 – 1900²).
	Order Limits and 100m buffer	and diterriteature (visible on 00 one men 1000 – 1900).
Unnamed woodland	TF 29066 32176 ECC 13	A small triangular area of woodland, broad-leaved mixed yew woodland, plantation (w1 36).
	100m buffer	Not accessible. From aerial mapping going back 2004, distinct rows are visible.
Unnamed woodland	TF 29710 29410 ECC 14	Broad-leaved mixed and yew woodland, secondary woodland (w1 38)
	100m buffer	Not accessible. From aerial mapping going back to 1999, no distinct rows of trees are apparent and therefore, a precautionary secondary woodland code has been applied. Perimeter hedgerows on two sides are also present. Going back further in the mapping records to 1888-1913 there is an ancient pond, which does not appear to be present today and replaced with waste/derelict ground (u1) (National Library of Scotland Website).
		Included in the MAGIC Priority Habitat Inventory - Deciduous Woodland (England).

21.6.2.5 Line of Trees (w1)

- 54. Lines of trees occur occasionally within the survey area within ECC 1, ECC 3, ECC 5 to ECC7 and ECC 9 to ECC 13 (Plate 21.9 and Plate 21.10). Lines of trees include both native and non-native tree species, some of which have been planted and others form associations with defunct sections of hedgerow where the hedgerow has been damaged, leaving behind trees *in situ*. Some of the trees that are mature or approaching maturity within the line of trees may represent a higher biological interest than the younger tree resource.
- 55. Species recorded include; ash, silver birch, willow sp. (*Salix* sp.), cherry (*Prunus* sp.), Leyland cypress (*Cupressus x leylandii*), pine sp. (*Pinus sp.*), magnolia sp.



135

(*Magnoliaceae* sp.), elder, lime sp. (*Tilia* sp.), elm sp. (*Ulmus* sp.), hawthorn, blackthorn, sycamore, beech (*Fagus sylvatica*), and pedunculate oak.



Plate 21.9: ECC 5 – Line of young trees, east of Church Lane, Skegness, Lincolnshire (Photograph taken September 2023)



Plate 21.10: ECC 5 – Line of non-native ornamental trees within the garden of a private residence, east of Croft Lane, Skegness, Lincolnshire (Photograph taken June 2023)



21.6.2.6 Hedgerows (h2)

- 56. Hedgerows are present across the survey area within all ECC 1 to ECC 14 and commonly classified as Priority Habitat (h2a). Most are nevertheless species-poor with the majority of these being dominated by hawthorn. Other woody species found within species-poor hedgerows were elder, dog rose, blackthorn, oak sp. (*Quercus* sp.), pedunculate oak, ash, privet (*Ligustrum sp.*), field maple, hazel, alder, silver birch, cherry (Prunus sp.), rose (*Rosa* sp.), and willow sp. (*Salix sp.*).
- 57. Three hedgerows; 546, 1926 (Plate 21.11) and 1928 were assessed as "important" according to the ecological requirements of the Hedgerow Regulations 1997 (using a precautionary approach) and these were located in ECC 5, ECC 7 and ECC 12.



Plate 21.11: ECC 7 – "Important Hedgerow" 1926, east of Small End Road, Friskney, Boston, Lincolnshire (Photograph taken March 2023)

21.6.2.7 Scrub (h3)

58. Although scrub is widespread across the site and occurs across each ECC 1 to ECC 14, its footprint is relatively small. In this instance scrub generally occurs in small patches within grassland habitats, at the interface between grassland and arable fields and along



1 March 2024

SLR Project No.: 410.V05356.00013

1 March 2024 SLR Project No.: 410.V05356.00013

the banks of watercourses and standing water. The primary scrub habitats that occur include; mixed scrub (h3h), blackthorn (h3a), hawthorn (h3f), bramble (h3d) and sea buckthorn (h3c).

59. The largest areas within the survey area include sea buckthorn within ECC 1 within the Landfall area, patches of neglected arable grassland reverting into mixed scrub within ECC 4 east of Middlemarsh Road and ECC 6 south of Scaldgate Road, hawthorn scrub to the east of Wyberton Roads within ECC 12 and hawthorn and mixed scrub to the southeast of Thompson's Lane (Plate 0-8) and Craven's Lane also within ECC 12 and hawthorn scrub to the east of Smeeton's Lane within ECC 13 (Plate 21.12). No large areas of bramble scrub were recorded.



Plate 21.12: ECC 13 – Scrub east of Smeeton's Lane, Boston, Lincolnshire (Photograph taken May 2023)

60. The large areas of scrub particularly within ECC 12 and 13 are likely to succeed into woodland within 5-10 years with much of the canopy closing, becoming thicker, and loss of ground flora in these areas.



1 March 2024 SLR Project No.: 410.V05356.00013

61. Sea buckthorn scrub (h3c) (Plate 21.13) was identified within ECC 1. Sea Buckthorn scrub is considered to be native on eastern coastal dunes from East Sussex and northward to Dunbar, however, in other locations it has been planted as a sea defence via dune stabilisation³. The area of sea buckthorn within the survey area is likely to have been planted. Although this is the case, the EU Habitats Directive identifies sea buckthorn scrub as a mosaic component in dune systems, however, it can become invasive and degrade species-rich dune grassland. In this context, this habitat was not considered likely to meet the dunes with sea buckthorn (h3c5) (H2160) Annex 1 habitat status.



Plate 21.13: ECC 1 – view of dense sea buckthorn and occasional mixed scrub, near Roundhouse, Roman Bank, Anderby Creek, East Lindsey, looking southeast, Lincolnshire (Photograph taken September 2023)

21.6.2.8 Standing Open Water (r1)

Ponds (r1a) were identified within ECC 1 to ECC 4, ECC 6 to ECC 8, ECC 10, ECC 12 and ECC 13. These include natural (41) ponds such as seasonally flooded depressions within CFPGM, waterbodies dominated with reedbed, and woodland ponds (Plate 21.14) and



 $^{^{3} \, \}underline{\text{https://lincolnshire.moderngov.co.uk/documents/s28346/Appendix\%20B.pdf}$

SLR Project No.: 410.V05356.00013

artificially man-made (39) ponds such as garden ponds, fishing ponds or lakes (Plate 21.15), duck ponds, lined arable farm pond, and temporary water bodies (162) (Plate 21.16) in heavily grazed grassland prone to frequently drying out.



Plate 21.14: ECC 1 – Natural woodland pond (Pond 19) north of Lowgate Road, Skegness, Lincolnshire (Photograph taken January 2023)





Plate 21.15: ECC 3 – Man-made fishing pond (Pond 39) north of Younger's Lane, Burgh le Marsh, Skegness, Lincolnshire (Photograph taken September 2022)



Plate 21.16: ECC 1 – Location of temporary water body (Pond 9), east of Roman Bank, Anderby Creek, Lincolnshire (Photograph taken September 2022)



1 March 2024 SLR Project No.: 410.V05356.00013

62. Most of the ponds within the survey area are likely to meet the Section 7 definition by supporting Section 41 or Red Data Book Species including plant and invertebrate communities although no specific surveys have been conducted with the exception of great crested newt (*Triturus cristatus*). Temporary water bodies within arable fields may be too ephemeral in nature to support such species and are therefore not likely to meet the criteria particularly with regards to qualifying plant species. Due to the agricultural landscape surrounding many of the ponds, the ponds are likely to be vulnerable with regards to nutrient enrichment from agricultural run-off, drainage, and other farming practices and as such may be less species-diverse as a result.

21.6.2.9 Rivers, Streams and Ditches (r2)

63. The survey area includes a network of arable drainage ditches (Plate 21.17) across ECC 1 to ECC 14, which are predominantly < 5m wide (denoted with secondary code 191 - ditches) with occasional larger ditches and historical drains > 5m wide (Plate 21.18) some of which are connected to the river catchments.



Plate 21.17: ECC 3 – Typical ditch habitat within the survey area, south of Younger's Lane, Burgh le Marsh, Skegness, Lincolnshire (Photograph taken June 2023)







Plate 21.18: ECC 11 – Historical Hobhole drain, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)

- 64. Other water courses include a section of the old course of the River Lymn which intersects ECC 5 adjacent to Croft Lane where it leaves the straight channel of the Steeping River and joins the Wainfleet Relief Channel. Further south the survey area passes through a section of the Wainfleet Relief Channel and the channel known as the Wainfleet Haven also located within ECC 5.
- 65. Sections of two tidal rivers (r2b 131); The Haven (Boston) and the River Welland (Fosdyke Bridge) (Plate 21.19) which flow into The Wash and are located within ECC 10 to ECC 12 and ECC 14. As these rivers are associated with The Wash estuary, the Annex 1 secondary code 30 for Estuaries (H1130) has been assigned for these river sections along with associated river bank habitats including mudflats (t2d) and saltmarsh (t2a) which are covered in more detail under Marine Inlets and Transitional Waters (t) Section 23.2.12.





Plate 21.19: ECC 11 and ECC 12 – View across the River Welland, Fosdyke, Boston Lincolnshire (Photograph taken August 2023)

66. Rivers have been assigned the UKHab classification "Other Rivers and Streams" (r2b), as no targeted river surveys have been completed to determine whether they might meet the HPI criteria for priority rivers (r2a) which is based on naturalness criteria (physical, hydrological, chemical, and biological). Rivers which have been significantly modified or degraded over time are unlikely to meet priority habitat status. In particular the section of Haven within survey area has had some riverbank modification through artificial management including shoring up the banks with ballast.

21.6.2.10 Wetland (f)

- 67. An area immediately southeast of the Fosdyke Bridge (A17) crossing of the River Welland was classified at a higher habitat level (Level 1) due to lack of access; wetland (f). This area make contain elements of priority habitats such as reedbeds, coastal saltmarsh and mudflats based on contextual information available for the surrounding habitats.
- 68. Reedbed (f2e) was identified within ECC 1, ECC 3 to ECC 5, and ECC 9, although it is likely that reedbed occurs occasionally throughout survey area, however, it was below the mappable units for the size of the project and are therefore may not be fully represented on the mapping output. For the same reason, aquatic marginal vegetation



1 March 2024

- 1 March 2024 SLR Project No.: 410.V05356.00013
- (f2d) is likely also to be present in the same habitat types as reedbed but has not been represented on the mapping due to the small scale of this habitat.
- 69. The largest expanses of reedbed are within ECC 1 at the Landfall area (Plate 21.20). The remainder occurs within ditches (Plate 21.21), drains, along riverbanks and the perimeter of standing water bodies within the survey area.



Plate 21.20: ECC 1 – Reedbed covering Pond 11 to the east of Roman Bank Road, Anderby Creek, Lincolnshire (Photograph taken September 2022)





Plate 21.21: ECC 1 – Reedbed along a ditch to the east of Ember Lane, Langham, Mumby, Alford, Lincolnshire (Photograph taken January 2023)

70. Marine Inlets and Transitional Waters (t) Coastal saltmarsh (t2a) (Plate 21.22) was identified within ECC 10, ECC 12 and ECC 13 along the banks of tidal rivers; The Haven, Boston and the River Welland where in a few locations, mudflats have graded into saltmarsh.



Plate 21.22: ECC 1 – An area of saltmarsh along the River Haven, Fishtoft, Boston, Lincolnshire (Photograph taken June 2023)



1 March 2024 SLR Project No.: 410.V05356.00013

71. Intertidal mudflats (t2d) was identified within ECC 10 to ECC14 along the banks of tidal rivers; The Haven, Boston (Plate 21.23) and The River Welland.



Plate 21.23: ECC 1 – Coastal mudflats either side of the River Haven, Fishtoft, Boston, Lincolnshire (Photograph taken January 2023)

- 72. Due to safety considerations at the riverbanks only a brief list of plant species was recorded as these locations. Species included water-plantain (*Alisma plantago-aquatica* sea-plantain (*Plantago maritima*), spurrey sp. (*Spergularia* sp.), common salt-marsh grass (*Puccinellia maritima*), seablite sp., goosefoot sp., marram grass, sea purslane (*Atriplex portulacoides*), couch sp., tall fescue, cock's-foot, sea aster (*Aster tripolium*), knapweed sp., reed sp. and thistle sp.
- 73. Sandy beach (t2h) (Plate 21.24) was identified within ECC 1 at landfall. This is predominantly a tourist beach as opposed to a more natural beach which is evident from the suppression or lack of native vegetation at this location.





Plate 21.24: ECC 1 – Typical view of the beach from near Roman Bank, Anderby Creek, East Lindsey, Lincolnshire (Photograph taken May 2022)

21.6.2.11Supralittoral Sediment (s3)

74. Embryonic shifting dunes (s3a5, (H2110)) was identified within ECC 1 (Plate 21.25) at the intersection between beach (t2h) and sea buckthorn scrub (h3c) and typical species recorded were couch sp. (*Elymus sp.*), marram grass (*Ammophila arenaria*) and lyme grass (*Leymus arenarius*). Coastal sand dunes (s3a) were not mapped in this instance as they are predominantly "fixed" and covered by swathes of dense sea buckthorn before grading into mixed scrub within the survey area and therefore preventing establishment by coarse maritime grasses which are characteristic of this habitat. There are likely to be some areas of s3a habitat interspersed within the sea buckthorn scrub, but this area was not fully accessible.





Plate 21.25: ECC 1 – View of scrub, sand dunes and beach from near Roundhouse, Roman Bank, Anderby Creek, East Lindsey, looking southeast, Lincolnshire (Photograph taken May 2022)

21.6.2.12 Urban (u1)

75. Urban areas and buildings within the survey area include (but are not limited to) small settlements, sheds, garages, greenhouse, caravan, containers, agricultural buildings (i.e., barns), warehouses, horse stables, retail buildings, pump house and a factory. These constitute a very small proportion of the surveyed area, and the majority were not subject to detailed survey, except where impacts from the cable installation were considered likely to present a disturbance impact with regards to bats. Detailed survey was concentrated on buildings within ECC 8, and further details are provided within the bat report (Volume 3, Appendix 21.4 Bat Report (document reference 6.3.21.9)).

21.6.3 Plant Species

21.6.3.1 Notable Plant Species

76. Whilst detailed surveys for specific plant species have not been undertaken, a small range of notable plant species has been recorded within the survey area during the field survey. The species are associated with cropland, neutral grassland, rivers and streams, scrub and woodland habitats and specific records are shown in Table 21.5



1 March 2024

Table 21.5: Notable Plant Species

Species	Habitat	Location and ECC Segment	Status
Bluebell	Woodland	TF 46450 57100	Schedule 8 of the Wildlife and Countryside Act (1981) as amended
(Hyacinthoides		ECC 6	
non-scripta)		100m buffer	
Sea-buckthorn	Scrub	TF 55400 75500	Nationally Scarce (NS)
(Hippophae rhamnoides)		ECC 1	(not based on IUCN criteria), although planted
		Order Limits	
Common	Cropland	TF 47671 58400	LWS criteria species for neutral grassland & calcareous grassland
knapweed		TF 44709 55245	
(Centaurea nigra)		TF 44793 54814	
		TF 52288 65011	
		TF 45388 55607	
		TF 45300 55500	
		TF 44468 54235	
		ECC 3, 6, 7 and 8	
		Order Limits and 100 buffer	
Crested Dog's-tail	Cropland	TF 47671 58400	LWS criteria species for neutral grassland
(Cynosurus		ECC 6	
cristatus)		Order Limits	
Pignut	Neutral grassland	TF 31500 32200	LWS criteria species for neutral grassland & heathland and acid grassland
(Conopodium		ECC 13	
majus)		100m buffer	
Meadowsweet	Rivers and steams	TF 52902 72591	LWS criteria species for neutral grassland
(Filipendula		ECC 1	
ulmaria)		100m buffer	
Yellow rattle	Cropland	TF 52293 65111	LWS criteria species for neutral grassland
(Rhinanthus minor)		ECC 3	
		100m buffer	
Bulbous	Cropland	TF 52293 65111	LWS criteria species for neutral grassland & calcareous grassland
buttercup	2.24	ECC 3	
(Ranunculus		100m buffer	
bulbosus)			
Meadow foxtail	Cropland	TF 52695 65633	LWS criteria species for neutral grassland
(Alopecurus pratensis)	Oropiand	TF 52700 65788	
		TF 52300 65000	
		TF 52400 64900	



1 March 2024 SLR Project No.: 410.V05356.00013

Species	Habitat	Location and ECC Segment	Status
		TF 52305 64534	
		TF 52301 64581	
		ECC 3	
		100m	
Smooth meadow- grass (<i>Poa pratensis</i>)	Neutral grassland	TF 48845 60096	LWS criteria species for neutral grassland
		TF 48921 60075	
		ECC 5	
		Order Limits	

21.6.3.2 Invasive Non-native Plant Species

77. No non-native invasive species (INNS) were recorded during the habitat survey, although it is possible that specimens of INNS may be present in areas which were not accessible during the survey or were not apparent due to the timings of some of the survey visits.

21.6.4 Important Ecological Features

21.6.4.1 Habitats

- 78. Whilst the majority of the survey area comprises agricultural cropland used for growing cereal and non-cereal crops and which is of limited ecological importance, the following Habitats of Principal Importance (i.e., those included under Section 41 of Natural Environment and Rural Communities (NERC) Act 2006) and habitats listed on Annex 1 of the Habitats Directive are confirmed to be present with the survey area and are shown on Figures 21.2.2.1 21.2.2.55. In all cases the reference definition for each habitat type has been taken from UK BAP Priority Habitat Descriptions which are provided at Annex A.
 - Arable field margins (c1a and c1a5)— This habitat was identified within all ECC 1
 to ECC 14, and some may have been managed to specifically provide benefit to
 wildlife. It is possible this habitat may be lost from its current locations, and/or be
 found in new locations in the future, depending on agricultural management
 practices;
 - Other neutral grassland and modified grassland, coastal and floodplain grazing marsh (g3c UKHab secondary code 25 and g4 UKHab secondary code 25) –



1 March 2024

SLR Project No.: 410.V05356.00013

1 March 2024

SLR Project No.: 410.V05356.00013

Coastal and floodplain grazing marsh was identified within ECC 1 to ECC 6, ECC 11 and ECC 12. It is possible this habitat may be lost from its current locations and/or range expanded, depending on agricultural management practices and/or restoration projects:

- None of the woodland within the Survey Area is listed as ancient woodland (ASNW and/or PAWs), in the Ancient Woodland Inventory. However, there is one LEPO; Friskney Decoy Wood, present within the survey area at ECC 6 which may be as rich as Ancient Woodland. Three priority woodland habitats were identified; two areas of lowland mixed deciduous woodland in ECC 3 and ECC 6 and one area of wet woodland within ECC 1.
- Hedgerows (h2a) most of the hedgerows within the survey meet the S41 definition. This habitat was identified within ECC 1 to ECC 14. Three hedgerows were assessed as "important" according to the ecological requirements of the Hedgerow Regulations 1997 (using a precautionary approach) and these were located in ECC 5, ECC 7 and ECC 12;
- Sea buckthorn scrub (h3c) This habitat was identified within ECC 1. Although
 the sea buckthorn in this location is likely to have been introduced to encourage
 dune stabilisation, some areas may meet the Annex 1 habitat definition (h3c5
 Dunes with sea buckthorn (H2160)) in less dense areas:
- Eutrophic standing waters, Ponds (r1a, UKHab secondary code 19) Ponds, for the purpose of the priority habitat classification, ponds are defined as permanent and seasonal standing water bodies up to 1 ha in extent which meet one or more criteria pertaining to notable or protected species. Most ponds in the area are likely to meet the Section 7 definition by supporting Section 41 or Red Data Book Species; all ponds are shown on Figure 21.7.2 and are concluded to be important ecological features apart from temporary pools within on arable fields. Some of the reed beds have also been classified with the priority UKHab secondary code 19. This habitat was identified within ECC 1 to ECC 4, ECC 6 to ECC 8, ECC 10, ECC 12 and ECC 13;
- Rivers (r2b) The Wainfleet Haven, The Haven (Boston) and The River Welland within the site are considered likely to meet the definition by virtue of supporting other protected and/or Section 41 (S41) species rather than for habitat type/quality per se. The remaining water courses within the survey area are not considered to meet the definition, but if S41 or protected species are later found



SLR Project No.: 410.V05356.00013

to use them then this report will be updated accordingly. This habitat was identified within ECC 5, ECC 10-12 and ECC 14;

- Estuaries ((H1130) UK Hab secondary code 30)) This habitat was assigned to the tidal river sections; The Haven (Boston) and The River Welland and their associated habitats; coastal saltmarsh and intertidal mudflats within ECC 10 to ECC 14;
- Reedbeds (f2e) This habitat occurs in limited locations within the ditch/drain network and are considered to meet the S41 definition. This habitat was identified within ECC 1, ECC 3 to ECC 5 and ECC 9. It's likely that further reedbed habitats are present within watercourse or pond edge habitats but were below mappable units for the size of the project;
- Coastal saltmarsh (t2a) This habitat was identified within ECC 10, ECC 12 and ECC 13;
- Intertidal mudflat (t2d)- This habitat was identified within ECC 10 to ECC 14; and
- Embryonic shifting dunes (s3a5, (H2110)) This habitat was identified within ECC 1.
- 79. Some of the habitats within the Order Limits and or 100m buffer are part of, or assist towards, Natural England Habitat Network Areas⁴. The NE Habitat Network Areas and their locations within the survey area ECC Segments are as follows:
 - Coastal sand dunes ECC 1;
 - Coastal saltmarsh ECC 10 and ECC 11;
 - Priority Habitat Inventory (PHI) other ECC 12;
 - Fragmentation Action Zone ECC 1 and ECC 13;
 - Network Enhancement Zone 1 ECC 1 and ECC 10-14;
 - Network Enhancement Zone 2 ECC 14:

⁴ Habitat Networks (England) is a spatial dataset that describes the geographic extent and location of Habitat Networks for 18 priority habitats based primarily, but not exclusively, on the priority habitat inventory with additional data added in relation to habitat restoration-creation, restorable habitat, plus fragmentation action, and network enhancement and expansion zones. The Habitat Network Maps provide spatial guidance to plan and develop local ecological networks and may be used to help target action to build greater ecological resilience for habitats across England.



1 March 2024

SLR Project No.: 410.V05356.00013

- Network Expansion Zone ECC 1 and ECC 10-14; and,
- Additional land within SSSIs (Site of Special Scientific Interest) ECC 10.

21.6.4.2 Plant Species

- 80. A range of notable plant species has been recorded within the survey area during the field survey; the species are associated with cropland, neutral grassland, rivers and streams, scrub and woodland habitats.
- 81. The species recorded on the IUCN Red List (Nationally Rare/Scarce) is sea-buckthorn. Schedule 8 species, bluebell was also recorded within Friskney Decoy Wood within ECC 6, to the west of Burgh Road. The remaining species in Table 21-5 have native UK status but are not included on the IUCN Red List, Local BAP or similar but are included as LWS criteria species for specific habitats.

21.7 Conclusion

- 82. Habitats within the survey area are, for the most part, unexceptional and reflect the lowland, intensively agricultural nature of the landscape. Several important habitats have however been identified, and these include arable field margins, coastal floodplain grazing marsh, lowland mixed deciduous woodland, wet woodland, hedgerows, sea buckthorn scrub, ponds, rivers and associated estuary habitats, reedbeds, coastal saltmarsh and mudflats and coastal sand dunes.
- 83. Although not classified under the priority habitat status, a Long-established woodland of plantation origin (LEPO); Friskney Decoy Wood has been identified within the survey area and many LEPO sites have developed semi-natural characteristics and may be as rich as Ancient Woodland. In addition, green lanes have been identified within the survey area which are again not classified as priority habitats; however, they are notable as these areas are often far richer in wildlife then standalone hedgerows because of the shelter and protection that they provide.



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1 March 2024

SLR Project No.: 410.V05356.00013

Annex A Biodiversity Action Plan Definitions



Annex A: Biodiversity Action Plan Definitions

Brief Summaries of the Biodiversity Action Plan (BAP) definitions referred to within the Results Section are provided below. References to the full detailed definitions are provided within each section below.

Arable Field Margins

UKBAP habitat definition for Arable Field Margins includes the following:

'Cultivated, low-input margins. These are areas within arable fields that are cultivated periodically, usually annually or biennially, but are not sprayed with spring/summer insecticides and not normally sprayed with herbicides (except for the control of injurious weeds or problem grasses such as creeping thistle, black grass, sterile brome or wild oat). Cultivated, low-input margins include conservation headlands and land managed specifically to create habitat for annual arable plants.'

'Margins sown to provide seed for wild birds. These are margins or blocks sown with plants that are allowed to set seed and which remain in place over the winter. They may be sown with cereals and/or small-seeded broad-leaved plants or grasses but areas sown with maize are excluded as they are of lower value for wild birds.'

'Margins sown with wildflowers or agricultural legumes and managed to allow flowering to provide pollen and nectar resources for invertebrates'.

'Margins providing permanent, grass strips with mixtures of tussocky and fine-leaved grasses. Areas of grass established as cross compliance requirements (see below) are excluded from this definition, but all other strips of grassland created by sowing or natural regeneration, such as field margins or beetle banks, are included.'

Fuller descriptions of the types of field margins included are provided in the UK BAP (JNCC, Website).

Within the Lincolnshire BAP the term 'arable field margin' is used to mean 'a planned strip of uncropped land lying between a crop and the field boundary (in addition to cross compliance requirements), that is deliberately managed to benefit biodiversity, with the added benefit of protecting boundary habitats from nutrient run-off. It also refers to uncropped plots and headlands within fields. Four types of margin are included in this definition: cultivated, low-input margins; margins sown to provide food for wild birds; margins sown to provide pollen and nectar for invertebrates; permanent grassy margins'.

Coastal Floodplain Grazing Marsh

A summary of the UKBAP definition for Coastal Floodplain Grazing Marsh is provided below.



'Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities.'

Fuller descriptions of the types of Coastal Floodplain Grazing Marsh are provided in the UK BAP (JNCC, Website).

Lowland Mixed Deciduous Woodland

A summary of the UKBAP definition for Lowland Mixed Deciduous Woodland is provided below.

'Lowland mixed deciduous woodland includes woodland growing on the full range of soil conditions, from very acidic to base-rich, and takes in most semi-natural woodland in southern and eastern England, and in parts of lowland Wales and Scotland. It thus complements the ranges of upland oak and upland ash types. It occurs largely within enclosed landscapes, usually on sites with well-defined boundaries, at relatively low altitudes, although altitude is not a defining feature. Many are ancient woods, and they include the classic examples of ancient woodland studied by Rackham (1980) and Peterken (1981) in East Anglia and the East Midlands. The woods tend to be small, less than 20ha. Often there is evidence of past coppicing, particularly on moderately acid to base-rich soils; on very acid sands the type may be represented by former wood-pastures of oak and birch.'

Fuller descriptions of the types of Lowland Mixed Deciduous Woodland are provided in the UK BAP (JNCC, Website).

Wet Woodland

A summary of the UKBAP definition for Wet Woodland is provided below.

'Wet woodland occurs on poorly drained or seasonally wet soils, usually with alder, birch and willows as the predominant tree species, but sometimes including ash, oak, pine and beech on the drier riparian areas. It is found on floodplains, as successional habitat on fens, mires and bogs, along streams and hill-side flushes, and in peaty hollows. These woodlands occur on a range of soil types including nutrient-rich mineral and acid, nutrient-poor organic ones. The boundaries with dryland woodland may be sharp or gradual and may (but not always) change with time through succession, depending on the hydrological conditions and the treatment of the wood and its surrounding land. Therefore, wet woods frequently occur in mosaic with other woodland key habitat types (e.g. with upland mixed ash or oakwoods) and with open key habitats such as fens. Management of individual sites needs to consider both sets of requirements.'



Fuller descriptions of the types of Wet Woodland are provided in the UK BAP (JNCC, Website).

Hedgerows

A summary of the UKBAP definition for a hedgerow is provided below.

'A hedgerow is defined as any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less that 20m wide. Any bank, wall, ditch or tree within 2m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2m of the centre of the hedgerow. All hedgerows consisting predominantly (i.e., 80% or more cover) of at least one woody UK native species are covered by this priority habitat, where each UK country can define the list of woody species native to their respective country'.

The Lincolnshire BAP definition is more generic, stating that: 'Hedgerows are linear strips of shrubs and trees often associated with features such as ditches, banks and grass verges. They resemble woodland edge and scrub habitats and may contain relics of ancient woodland vegetation.'

Reedbed

A summary of the UKBAP definition for reedbed is provided below.

Reedbeds are wetlands dominated by stands of the common reed Phragmites australis, wherein the water table is at or above ground level for most of the year. They tend to incorporate areas of open water and ditches, and small areas of wet grassland and carr woodland may be associated with them. There are about 5000 ha of reedbeds in the UK, but of the 900 or so sites contributing to this total, only about 50 are greater than 20 ha, and these make a large contribution to the total area. Reedbeds are amongst the most important habitats for birds in the UK. They support a distinctive breeding bird assemblage including 6 nationally rare Red Data Birds the bittern Botaurus stellaris, marsh harrier, Circus aeruginosus, crane Grus grus, Cetti's warbler Cettia cetti, Savi's warbler Locustella luscinioides and bearded tit Panurus biarmicus, provide roosting and feeding sites for migratory species (including the globally threatened aquatic warbler Acrocephalus paludicola) and are used as roost sites for several raptor species in winter. Five GB Red Data Book invertebrates are also closely associated with reedbeds including red leopard moth Phragmataecia castanaea and a rove beetle Lathrobium rufipenne.'

Fuller descriptions of Reedbed are provided in the UK BAP (JNCC, Website).

Standing Open Waterbodies

The Lincolnshire BAP describes standing open waterbodies to 'comprise a range of habitat types, both natural and artificial. Ponds are generally defined as small bodies of water – between 1m² and 2ha in



area – which hold water for more than four months in a year. Anything larger than 2ha is defined as a lake. Small ponds make up the majority of waterbodies in the UK.

Artificial stillwaters include reservoirs and ponds of many types (fishing ponds, public amenities, supply reservoirs, etc). They also include ponds and lakes created by flooding of old industrial sites, such as quarries, gravel pits or old brick clay workings. Other stillwaters occur as a result of all manner of natural processes, including depressions created by glacial action or buckling of strata, exposure of aquifer surfaces, or fluvial processes, for example, ox-bows, where meanders are cut-off by sediment deposition. In addition to permanent waterbodies, ponds that seasonally dry out are important for a variety of species of conservation concern, adapted to ephemeral habitats.'

The UKBAP definitions further subcategorise this definition into the following: 'Oligotrophic and Dystrophic Lakes', 'Ponds', 'Mesotrophic Lakes', 'Eutrophic Standing Waters', and 'Aquifer Fed Naturally Fluctuating Water Bodies.' A summary for each of these habitat definitions are provided below.

Oligotrophic and Dystrophic Lakes

The UK BAP Priority definition states 'Oligotrophic and dystrophic lakes are water bodies mainly more than 2ha in size which are characterised by their low nutrient levels and low productivity. Their catchments usually occur on hard, acid rocks, most often in the uplands. This habitat type encompasses a wide range of size and depth, and includes the largest and deepest water bodies in the UK. Good examples may support some of the least disturbed aquatic assemblages in the UK. Oligotrophic lakes usually have very clear water, whilst some examples with dystrophic characteristics have peat-stained waters. Characteristic plankton, zoobenthos, macrophyte and fish communities occur, including several UK BAP species and species of economic importance. Fish communities, generally dominated by salmonids, may include charr (Salvelinus alpinus and Coregonus spp.). A number of benthic and planktonic invertebrates, found only in oligotrophic lakes, are possibly glacial relicts. Macrophytes are typically sparse, with species such as shoreweed (Littorella uniflora) and quillwort (Isoetes spp.). Shores are typically stony, and emergent vegetation is generally restricted to sheltered bays, where species such as bottle sedge (Carex rostrata) and bulrush (Scirpus lacustris) may be found. Oligotrophic and dystrophic lakes support a range of UK BAP priority species and other species listed on Annexes of the Habitats and Birds Directives (e.g. slender naiad (Najas flexilis), salmon (Salmo salar), common scoter (Melanitta nigra), black-throated diver (Gavia arctica), and otter (Lutra lutra).'

Ponds

The UK BAP Priority definition states that ponds 'are defined as permanent and seasonal standing water bodies up to 2ha in extent, which meet one or more of the following criteria:



'Habitats of international importance: Ponds that meet criteria under Annex I of the Habitats Directive.

Species of high conservation importance: Ponds supporting Red Data Book species, UK BAP species, species fully protected under the Wildlife and Countryside Act Schedule 5 and 8, Habitats Directive Annex II species, a Nationally Scarce wetland plant species, or three Nationally Scarce aquatic invertebrate species.

Exceptional assemblages of key biotic groups: Ponds supporting exceptional populations or numbers of key species. Based on (i) criteria specified in guidelines for the selection of biological SSSIs (currently amphibians and dragonflies only), and (ii) exceptionally rich sites for plants or invertebrates (i.e., supporting \geq 30 wetland plant species or \geq 50 aquatic macroinvertebrate species).

Ponds of high ecological quality: Ponds classified in the top PSYM category ("high") for ecological quality (i.e., having a PSYM score ≥75%). [PSYM (the Predictive System for Multimetrics) is a method for assessing the biological quality of still waters in England and Wales; plant species and/or invertebrate families are surveyed using a standard method; the PSYM model makes predictions for the site based on environmental data and using a minimally impaired pond dataset; comparison of the prediction and observed data gives a % score for ponds quality].

Other important ponds: Individual ponds or groups of ponds with a limited geographic distribution recognised as important because of their age, rarity of type or landscape context (e.g. pingos, duneslack ponds, machair ponds).'

Mesotrophic Lakes

The UK BAP Priority definition states that Mesotrophic lakes are 'relatively infrequent in the UK and largely confined to the margins of upland areas in the north and west. They are characterised by having a narrow range of nutrients, the main indicative ones being inorganic nitrogen (N) and total phosphorus (P). Typically, mesotrophic lakes have nutrient levels of 0.3–0.65 mgNl-1 and 0.01–0.03 mgPl-1. Whilst such levels simplify the complex interaction between plant nutrients and the hydrological and physical characteristics of individual lakes (for instance, virtually all available nutrients are 'locked up' in algae during the growing season), they serve to show the sensitivity of the trophic state to artificially increased levels of nitrogen and phosphorus. Thus, this is an increasingly rare type of lake. Several of the largest and most important lakes in the UK, including Lough Neagh and Lower Lough Erne were once mesotrophic but are now classified as eutrophic and not included in this action plan. Two existing large mesotrophic lakes, Lough Melvin and Upper Lough MacNean straddle the international border with the Republic of Ireland.'

In addition, 'Mesotrophic lakes potentially have the highest macrophyte diversity of any lake type.

Furthermore, relative to other lake types, they contain a higher proportion of nationally scarce and rare



aquatic plants. Macroinvertebrates are well represented, with particularly important groups being dragonflies, water beetles, stoneflies and mayflies. Rare fish, of which only three species are found in UK lakes, are well represented in mesotrophic lakes... In general, fish communities in mesotrophic lakes are a mix of coarse and salmonid species, but today there are few truly natural assemblages due to introduced species.'

Eutrophic Standing Waters

'Eutrophic standing waters are highly productive because plant nutrients are plentiful, either naturally or as a result of artificial enrichment. These water bodies are characterised by having dense, long-term populations of algae in mid-summer, often making the water green. Their beds are covered by dark anaerobic mud, rich in organic matter. The water column typically contains at least 0.035mgL-1 total phosphorus (which includes phosphorus bound up in plankton and 0.5mgL-1 or more total inorganic nitrogen (mainly in the form of dissolved nitrates) ... Eutrophic waters are most typical of hard water areas of the lowlands of southern and eastern Britain, but they also occur in the north and west, especially near the coast.'

Aquifer Fed Naturally Fluctuating Water Bodies

Such waterbodies are defined as 'natural water bodies which have an intrinsic regime of extreme fluctuation in water level, with periods of complete or almost complete drying out as part of the natural cycle. They have no inflow or outflow streams at the surface, except at times of very high water level, when temporary out-flows may develop. Instead, they are directly connected to the underlying groundwater system and periodically empty and are recharged via swallow holes or smaller openings in their beds.'

Rivers and streams

The UK BAP definition includes a wide range of river types and encompasses all natural and near natural running waters in the UK. Numerous natural factors influence the ecology of a watercourse, with many of these changing as the water flows from source to sea or lake, with human activities adding further complexity to this picture.

In light of this, although various classifications and typologies for rivers exist, none are considered adequate for identifying a comprehensive series of specific priority types for Rivers, and as such, the UKBAP Habitat definition includes a broad river classification (which includes chalk rivers). However, work has been conducted to refine the criteria to identify the priority habitat. See below criteria taken from the UKBAP Habitat definition.

'River water bodies will qualify as BAP priority habitat either because they are considered to be nearnatural, or because they fulfil one or more specific criteria relating to BAP priority species or to



particular habitat types. ... As a significant proportion of the running water resource in the UK is likely to qualify, achievable priorities will need to be set for action... The list of qualifying criteria is as follows...

- Riverine water bodies of high hydromorphological/ecological status. The Environment
 Agency, the Northern Ireland Environment Agency and the Scottish Environmental
 Protection Agency have developed criteria and rules to identify such water bodies
 (http://www.wfduk.org/resources%20/river-morphology-high-status-features-and-criteria).
- Headwaters. To qualify as a priority habitat for 'Rivers' under the criterion of 'headwaters' a
 stream must be: a watercourse within 2.5km of its furthest source as marked with a blue
 line on Ordnance Survey (OS) maps at a scale of 1:50,000. Note that each tributary of a
 river will have its own headwater, so there will be more than one (sometimes many more)
 per catchment. Headwaters which have been significantly altered from their natural state
 are however not included.
- Occurrence of the EC Habitat Directive Annex I habitat (H3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation). The definition will include (but not be confined to) all river SACs designated for the feature.
- Chalk Rivers as given in the existing BAP definition.
- Active shingle rivers. Data for this can come from River Habitat Surveys (Environment Agency 2003) or indicator species of invertebrate (see criterion 7).
- A/SSSIs (Areas/Sites of Special Scientific Interest) designated for river species, riverine features or fluvial geomorphology.
- Species including:
- o Annex II Habitats Directive species 3
- BAP priority species
- Invertebrate species which are strongly indicative of river shingle
- See the list of qualifying species, Annex 1. To qualify, an ECS or WFD water body needs to have either:
 - o records of any one species from criterion levels A (BAP priority species strongly dependent on river habitat quality) or C (non-BAP priority species, indicative of shingle rivers), or
 - o from criterion level B (widespread BAP priority species which are less dependent on river habitat quality alone), records of six or more species. This threshold has been selected by



looking at available records for all criteria and identifying a level which returns a manageable proportion of the rivers network.'

It is important to note that the UKBAP Habitat criteria also makes allowance for where English, Northern Irish, Scottish or Welsh country biodiversity groups have signed off their own lists of BAP priority species, including species which are not in the UK list, should these species be present within the rivers, then such rivers can qualify for these species using criteria agreed at country level.

Also included within the UBAP Habitat Definition for River is the criteria for chalk rivers. Such rivers have a characteristic plant community, often dominated by water crowfoot (*Ranunculus penicillatus* var. *pseudofluitans*) and starworts (*Callitriche obtusangula* and *C.platycarpa*) within the middle of the channel, and along the edges by watercress (*Rorippa nastrurtuum-aquaticum*) and lesser waterparsnip (*Berula erecta*). They generally have low banks which support further water-loving flora. The rivers are known to support rich diversity of invertebrate life and fisheries. Annex II species the rivers support include brown trout (Salmo trutta), brook lamprey (*Lampetra planeri*), salmon (*Salmo salar*), crayfish (*Austropotamobious pallipes*), and otter (*Lutra lutra*).

Further information regarding this UK BAP Habitat is available at: <u>Rivers (UK BAP Priority Habitat</u> description) (jncc.gov.uk).

The Lincolnshire BAP separates the Rivers into Chalk and blow streams priority habitat and rivers, canals, and drains priority habitat. Other wetland habitat listed under the BAP includes Fens; Ponds, lakes, and reservoirs; reedbeds and bittern (*Botaurus stellais*); and springs and flushes.

The BAP defines chalk rivers as 'fed from groundwater aquifers, producing clear waters and a generally stable flow and temperature regime. These conditions support a rich diversity of animals (including lamprey, brown trout, grayling and otter) and a characteristic calcicole (lime-loving) flora. Most may exhibit seasonal drying in their upper reaches due to lack of rainfall recharging the aquifer, but many also experience this due to drawdown due to abstraction pressure.' Whilst blow wells are defined as 'Blow wells are an unusual feature of the hydrogeology of north-east Lincolnshire. They are chalk-water springs occurring where high groundwater pressure has forced a flow path upward through the confining boulder clay and gravel69. Like chalk streams, blow wells also have characteristic associated flora and fauna, but their status as geological features make them worthy of protection in their own right.'

The Lincolnshire BAP Habitat Action Plan for Rivers covers all Lincolnshire's watercourses – natural, modified, and man-made. The only exception is chalk rivers which are covered within their own Habitat Action Plan.



Coastal Saltmarsh

A summary of the UKBAP definition for Coastal Saltmarsh is provided below.

'Coastal saltmarshes in the UK (also known as 'merse' in Scotland) comprise the upper, vegetated portions of intertidal mudflats, lying approximately between mean high water neap tides and mean high water spring tides. For the purposes of this action plan, however, the lower limit of saltmarsh is defined as the lower limit of pioneer saltmarsh vegetation (but excluding seagrass Zostera beds) and the upper limit as one metre above the level of highest astronomical tides to take in transitional zones. Saltmarshes are usually restricted to comparatively sheltered locations in five main physiographic situations: in estuaries, in saline lagoons, behind barrier islands, at the heads of sea lochs, and on beach plains. The development of saltmarsh vegetation is dependent on the presence of intertidal mudflats.'

Fuller descriptions of Coastal Saltmarsh are provided in the UK BAP (JNCC, Website).

Intertidal Mudflats

A summary of the UKBAP definition for Intertidal Mudflats is provided below.

'Mudflats are sedimentary intertidal habitats created by deposition in low energy coastal environments, particularly estuaries and other sheltered areas. Their sediment consists mostly of silts and clays with a high organic content. Towards the mouths of estuaries where salinity and wave energy are higher the proportion of sand increases. Mudflats are intimately linked by physical processes to, and may be dependent on, other coastal habitats such as soft cliffs and saltmarshes. They commonly appear in the natural sequence of habitats between subtidal channels and vegetated saltmarshes. In large estuaries they may be several kilometres wide and commonly form the largest part of the intertidal area of estuaries. However, in many places they have been much reduced by land claim.'

Fuller descriptions of Intertidal Mudflats are provided in the UK BAP (JNCC, Website).

Coastal Sand Dunes

A summary of the UKBAP definition for Coastal Sand Dunes is provided below.

'Coastal sand dunes develop where there is an adequate supply of sand (sediment within the size range 0.2 to 2.0 mm) in the intertidal zone and where onshore winds are prevalent. The critical factor is the presence of a sufficiently large beach plain whose surface dries out between high tides. The dry sand is then blown landwards and deposited above high water mark, where it is trapped by specialised dune-building grasses which grow up through successive layers of deposited sand.'

'Sand dune vegetation forms a number of zones, which are related to the time elapsed since the sand was deposited, the degree of stability which it has attained, and the local hydrological conditions.



Embryonic and mobile dunes occur mainly on the seaward side of a dune system where sand deposition is occurring and occasionally further inland in blow-outs. They support very few plant species, the most characteristic being marram grass Ammophila arenaria. Semi-fixed dunes occur where the rate of sand accretion has slowed but the surface is still predominantly bare sand; marram is still common but there is an increasing number of other species. Fixed dune grassland forms largely closed swards where accretion is no longer significant, the surface is stabilised and some soil development has taken place. Calcareous fixed dunes support a particularly wide range of plant species. On dunes which have become acidified by leaching, acid dune grassland or dune heaths develop. Dune heaths are usually dominated by heather Calluna vulgaris. Acidic dunes which are heavily grazed by rabbits may support lichen communities. Dune slack vegetation occurs in wet depressions between dune ridges; it is often characterised by creeping willow Salix repens sap. argentea and a number of mosses. Fixed dunes and dune heath are particularly threatened habitats and are regarded as priorities under the EC Habitats Directive.'

'The fixed dune communities mentioned above are, or have been, maintained by grazing, whether by domestic stock or by rabbits. In their absence, the succession proceeds to rough grass and scrub. Dune scrub can include several species but only one of them, sea buckthorn Hippophaë rhamnoides, is largely confined to dunes; it is native to eastern England and south-east Scotland and has been widely introduced elsewhere, where it's very invasive nature can cause problems. Wetter parts of dune systems may become colonised by sallows Salix spp., birches Betula spp. or alder Alnus glutinosa.'

Fuller descriptions of Coastal Sand Dunes are provided in the UK BAP (JNCC, Website).

Estuaries (H1130)

A summary of the JNCC description of Estuaries (H1130) is provided below.

'Estuaries are habitat complexes which comprise an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. Many of these habitats, such as 1140 Mudflats and sandflats not covered by sea water at low tide, saltmarshes, 1110 Sandbanks which are slightly covered by sea water all the time and 1170 Reefs, are identified as Annex I habitat types in their own right.'

'Estuaries are defined as the downstream part of a river valley, subject to the tide and extending from the limit of brackish water. There is a gradient of salinity from freshwater in the river to increasingly marine conditions towards the open sea. The input of sediment from the river, the shelter of the estuary from wave action, and the often low current flows typically lead to the presence of extensive intertidal sediment flats and sediment-filled subtidal channels. There is usually only a limited extent of



rocky habitat. In contrast, marine inlets where seawater is not significantly diluted by freshwater are considered as Annex I type 1160 Large shallow inlets and bays.'

Fuller descriptions of Estuaries (H1130) are provided on the JNCC, Website.

Dunes with Hippophae rhamnoides (2160)

A summary of the JNCC description of Dunes with *Hippophae rhamnoides* (2160) is provided below.

'Dunes with Hippophae rhamnoides comprise scrub vegetation on more-or-less stable sand dunes in which sea-buckthorn H. rhamnoides is abundant. Sea-buckthorn may either form dense thickets, with sparse nitrophilous associates such as common nettle Urtica dioica, or occur as more scattered bushes interspersed with various grasses, typically marram Ammophila arenaria and red fescue Festuca rubra, and associated herbs of dune grassland. This vegetation corresponds with NVC type SD18 Hippophae rhamnoides dune scrub.'

'This habitat is found at scattered coastal localities around the UK, but as a native vegetation type it is confined to a few sites on the east coast of England (Pearson & Rogers 1962). Elsewhere seabuckthorn has been planted, and is generally regarded as a conservation problem as it tends to invade other dune habitats and change the nutrient status of the soil where it grows.'

Fuller descriptions of Dunes with Hippophae rhamnoides (2160) are provided on the JNCC, Website.



