# **DBFL Consulting Engineers**

Proposed Boyne Greenway (Drogheda to Mornington) Project

# Appropriate Assessment: Stage 2 NIS

July 2020

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It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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The findings outlined within this report and the data we have provided are to our knowledge true, and express our bona fide professional opinions. This report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct. Where pertinent CIEEM Guidelines used in the preparation of this report include the *Guidelines for Ecological Report Writing* (CIEEM, 2017a), *Guidelines for Preliminary Ecological Appraisals* (CIEEM, 2017b) and *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018). CIEEM Guidelines include model formats for Preliminary Ecological Appraisal and Ecological Impact Assessment. Also, where pertinent, evaluations presented herein take cognisance of recommended Guidance from the EPA such as *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017), and in respect of European Sites, *Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (European Commission, 2019).

Due cognisance has been given at all times to the provisions of the Wildlife Act, 1976, the Wildlife (Amendment) Act, 2000, the European Union (Natural Habitats) Regulations. SI 378/2005, the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), EU Regulation on Invasive Alien Species under EU Regulation 1143/2014, the EU Birds Directive 2009/147/EC and Habitats Directive 92/43/EEC.

No method of assessment can completely remove the possibility of obtaining partially imprecise or incomplete information. Any limitation to the methods applied or constraints however are clearly identified within the main body of this document.

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# 1 Introduction

This Natura Impact Statement (NIS) Report has been prepared by Inis Environmental Consultants to inform the Appropriate Assessment (AA) process required for the proposed Boyne Greenway project from Drogheda East to Mornington.

This document comprises the Screening for Appropriate Assessment (Stage 1) which screens and evaluates likely significant effects of the updated proposed works upon designated European sites. In the current context, where significant effects are considered likely, in view of the qualifying interests or special conservation interests and the respective conservation objectives of any European site, the Screening identifies that Appropriate Assessment is required. Therefore, this NIS report provides mitigation to avoid adverse effects on European site integrity. This report is conducted in line with the requirements of Article 6(3) of the EU Habitats Directive (92/43/EEC) and the National Parks and Wildlife Service (NPWS) Guidance for Planning Authorities (2010), and it is intended that the information contained within this document will form the basis for the Article 6(3) Appropriate Assessment process completed by the Competent Authority.

The preparation of this Screening for Appropriate Assessment Report has had regard to:

- EU Habitats Directive (92/43/EEC);
- EU Birds Directive (Council Directive (2009/147/EC);
- the Part XAB of the Planning and Development Act 2000;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);
- Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2002);
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (2010); and
- Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive'
   92/43/EEC (European Commission, 2018).

## 1.1 Legislative Context

Article 6(3) of the Habitats Directive requires that, in relation to European designated sites (i.e. SACs and SPAs that form the Natura 2000 network), "any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives".

A competent authority (e.g. a Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned. Under article 6(4) of the Directive, if adverse impacts are likely, and in the absence of alternative options, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (IROPI), including social or economic reasons, a Member State is required to take all compensatory measures necessary to ensure the overall integrity of the European site. The European Commission have to be informed of any compensatory measures adopted, unless a priority habitat type or species is present and in which case an opinion from the European Commission is required beforehand (unless for human health or public safety reasons, or of benefit to the environment).

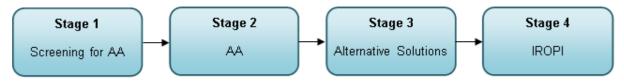
# 1.2 Appropriate Assessment Process

Appropriate Assessment is the process through which the possible nature conservation implications of any plan or project on the European sites within the Natura 2000 network is considered by a Competent Authority, before a decision is made to allow that plan or project to proceed.

## 1.2.1 Stages of the Appropriate Assessment

Appropriate Assessment involves a number of steps and tests that are applied using a stage-by-stage approach. Each step or stage in the assessment process precedes and provides a basis for other steps. The four stages in an Appropriate Assessment (AA), are further described below.

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2010). These guidance documents identify a staged approach to conducting an AA, as shown in **Figure 1.1.** 



**Figure 1.1**: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities DoEHLG, 2010).

#### Stage 1 – Screening for AA

This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant.

#### **Stage 2- Appropriate Assessment**

In this stage, the impact of the project on the integrity of the Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function. Mitigation measures should be applied to the point where no adverse impacts on the site(s) remain.

#### **Stage 3 - Alternative Solutions**

Should the Appropriate Assessment determine that adverse impacts are likely upon a Natura 2000 site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts. For the avoidance of doubt, no reliance is placed on Stage 3.

#### Stage 4 - IROPI

Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the Natura site will be necessary. European case law highlights that consideration must be given to alternatives outside the project area in carrying out the IROPI test. It is a rigorous test which projects are generally considered unlikely to pass. In any event, the developer does not purport to place any reliance on Stage 4.

# 2 Description of the Proposed Development

The proposed design comprises a pedestrian and cycle route along the Boyne Greenway: Drogheda to Mornington route corridor (a minimum of 4m wide of a cycle and pedestrian path) which will provide a safe, traffic-free environment for tourists and local users to cycle or walk adjacent to the Boyne river, estuary and coast, extending from east of Drogheda (Ship Street, which is located adjacent to the railway viaduct Belfast - Dublin line) to Mornington, Co. Meath.

The proposed Boyne Greenway route generally follows the existing R150/R151 Regional Road, to ensure that open views to the Boyne Estuary are retained where possible and maximising the benefits of the greenway. A significant portion of the route falls within the boundary of the Boyne Estuary Special Protection Area and Special Area of Conservation.

The proposed route for the Boyne Greenway is approximately 5.9 km in length with approximately 4.1 km of the route directly alongside the Regional Road, and 1.8km off the Regional Road to ensure both a safe continuation of the route and the retention of the views across the Boyne Estuary (**Figure 2.1**).

There are a number of constraints and opportunities, both natural (i.e. existing natural environment) and physical (the built environment), which constrain route options for the proposed scheme within the defined study area. These include:

- River Boyne;
- Boyne Estuary SPA and the Boyne Coast and Estuary SAC;
- Existing and committed future development along the route;
- Existing monuments and protected structures along the route such as Mornington Bridge;
- Mature Trees and other natural features along the Marsh Road (R150) and Mornington Road (R151);
- Road alignment along the Marsh Road (R150) and Mornington Road (R151);
- The need to maintain traffic flow for access to local amenities;
- Land ownership; and
- Environmental impacts and engineering constraints such as steep topography, frequent watercourse crossings, and potential flooding.

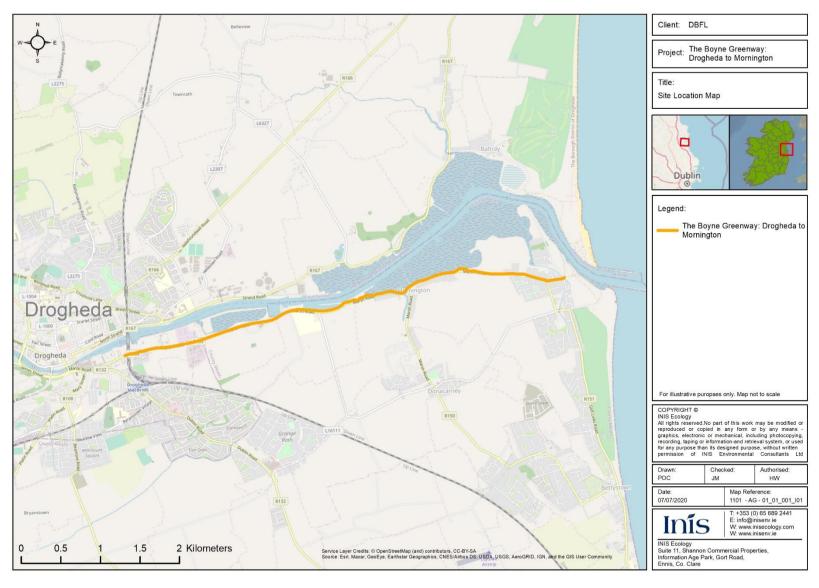


Figure 2.1: Location of the proposed Boyne Greenway Drogheda to Mornington route.

Sections of the proposed Greenway route overlap or run adjacent to the boundaries of the Boyne Estuary Special Protection Area (SPA). The Boyne Estuary in general is the second most important estuary for wintering birds on the Louth-Meath coastline. Black-tailed Godwit occurs here in internationally important numbers and a further nine species of wintering water birds have populations of national importance (i.e. Shelduck, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Redshank and Turnstone). Of particular significance is that three species that regularly occur, Golden Plover, Bar-tailed Godwit and Little Tern are listed on Annex I of the E.U. Birds Directive. Part of the Boyne Estuary SPA is a Wildfowl Sanctuary. The estuary provides both feeding and high-tide roost areas for these birds.

Sections of the proposed Greenway route also overlap or run adjacent to the boundaries of the Boyne Coast and Estuary Special Area of Conservation (SAC), a coastal site which includes most of the tidal sections of the River Boyne, intertidal sand- and mudflats, saltmarshes, marginal grassland, and the stretch of coast from Bettystown to Termonfeckin that includes the Mornington and Baltray sand dune systems. The site is designated due to the presence of the following habitats; Estuaries, Tidal Mudflats and Sandflats, Annual vegetation of drift lines, Salicornia Mud, Atlantic Salt Meadows, Embryonic Shifting Dunes, Marram Dunes (White Dunes), Fixed Dunes (Grey Dunes).

The western portion of the proposed Greenway lies due south and within close proximity of the River Boyne and River Blackwater SAC. This designated site includes a number of habitats and species listed on Annex I/II of the EU Habitats Directive, including alkaline fens, alluvial forests, river lamprey, Atlantic salmon and otter.

# 2.1 Proposed Works

#### 2.1.1 Overview

The proposed Boyne Greenway will be constructed utilising two different methodologies, selected according to the sensitivities of the landscape and environment requirements encountered within the areas crossed by the route:

- 1. Construction directly alongside, or within very close proximity of, the regional road within an area of existing roadside verge; and
- 2. Construction significantly away from the roadside and/or within the intertidal zone/SPA/SAC.

Each of the above requirements is discussed below, providing an overview of the proposals and measures intrinsic to project design which will avoid significant impact on the ecological aspects of the scheme.

#### 2.1.2 Greenway Construction Alongside Road

There is approximately 4.1km of the proposed greenway to be constructed alongside the road or very close to the road edge. Given the location, access and low maintenance requirements, robust construction forms are preferred. Therefore, bituminous construction, in accordance with the recommendations of the TII Design Manual for Roads and Bridges (TII DMRB) (TII, 2013) is considered the most appropriate. With this proposed form of construction, verge vegetation would be cleared with limited additional excavation. The pavement will be formed by placing imported granular subbase material on a geotextile separator and finished with approximately 100mm of bituminous surfacing in accordance with the TII DMRB (TII, 2013). The width of the greenway will be limited to 4 metres and

restrained on each side with a kerb. Some similar greenway examples are provided in **Figure 2.2** for illustration.





Figure 2.2: Examples of Greenway Alongside Road (Holland and Ireland).

As part of the proposed construction methodology, a number of proposed measures will be employed to ensure minimal impact during construction of the greenway:

- a. Works will be restricted to outside the period of Oct-March at all sensitive sites where disturbance is an issue, i.e within the SAC/SPA or immediately adjacent. The timing restriction will not apply to public road sections;
- b. Construction works will be limited to daylight hours to avoid effects on bats, birds and otters. The use of construction lighting will be limited to absolute minimums. Where it is necessary, all lighting will be cowled away from sensitive habitats, with no light spillage, in line with best practice for bats. Only existing municipal compound areas will be utilised, and security lighting will be sensor based at these locations;
- c. The timing of the works and the measures intrinsic to the design, outlined above, will be sufficient to avoid significant effects. Nevertheless, if on the advice of the onsite ecologist further protection is required, then a suitable camouflage barrier netting will be utilised. Camouflage netting will be utilised on all roadside works outside the period March to September, to minimise noise transfer, as a matter of course;
- d. Regular monitoring of the works will be provided by a suitably qualified ECoW with authority to 'Stop the Works'. The representative will have knowledge of working on construction programmes within SAC and SPA areas where significant bird populations exist; and
- e. In operation, the roadside greenway should have a negligible impact on the fauna and flora in the long term as it is generally alongside the road which would have a similar impact to that of the greenway. Nonetheless, further direction will be taken from the ecological consultant and NPWS. The following measures are proposed to limit the impact of the greenway in operation:
  - 1) No engineered barriers are proposed. This will minimise any visual impact both from the road or estuary side. Nonetheless, natural mid-level barrier planting will be provided particularly were similar items have been removed to allow for the greenway. Native species of hedging, locally sourced, will be utilised for biodiversity enhancement. This would offer protection to birds and act as general biodiversity enhancement; and

2) Operational lighting, where necessary for security and safety, will be LED based (to avoid emission of UV light) and will be cowled away from estuarine habitats with no light spillage in line with best practice for bats and birds. Low energy LED luminaires incorporating a solar power source and motion detectors will be used throughout. Furthermore, to minimise the requirement for lighting all access features, such as bollards and gates, shall have reflectorised strips in line with best practice guidance. No lighting will be provided where birds forage within 50 metres of the cycle path to avoid any disturbance.

# 2.1.3 Greenway Construction Intertidal Zones/SPA/SAC

There is approximately 2.4km of proposed greenway within the SPA/SAC areas with approximately 610 metres of this within the intertidal zone. In these areas it is proposed that the greenway be elevated onto a boardwalk structure to minimise impact, as agreed provisionally with the ecological consultant. The boardwalk will be constructed at a minimum level defined within the flood risk assessment report (3.54m Above Ordnance Datum). This is approximately 1.5 metre above the present day highest astronomical tide level and will mitigate the risk of flood throughout the design life of the boardwalk section of greenway. The width of the boardwalk will be limited to 4metres (maximum). Following a review of the options, and in consultation with the ecological consultant, it has been agreed that the elevated boardwalk be formed using propriety recycled plastic elements. Further detail bellow.

#### 2.1.3.1 **Proprietary Recycled Plastic Elements**

A section of Phase 1 of the Boyne Greenway has already been constructed using this form (see **Figure 2.3**). It involves installing recycled plastic components much like forming a similar timber structure. Long column type elements, typically 100mm by 100mm square, are installed into the underlying ground at regular intervals acting as mini piles. They are installed to a depth to suit the underlying geology and provide the required level of load capacity. The running surface is then created by bolting transverse and longitudinal beams together. Running boards are then fixed to the beams to provide the surface. As the boardwalk is elevated, a barrier will be necessary. This is fixed to the elevated structure and uses similar recycled plastic components.

As the intertidal, SPA and SAC areas are typically away from the road, and are most ecologically sensitive, the following measures will be employed to ensure minimal impact during construction of the greenway:

- a. The works will be scheduled to avoid the winter months between October and March when most of the species likely to be affected will be present. Therefore, all works will be undertaken between March and September;
- b. The timing of the works and the measures intrinsic to the design, outlined above, will be sufficient to avoid significant effects. Nevertheless, if on the advice of the onsite ecologist further protection is required, then a suitable camouflage barrier netting will be utilised;
- c. Construction works will be limited to daylight hours to avoid effects on bats, birds and otters. The use of construction lighting will be limited to absolute minimums. Where it is necessary, all lighting will be cowled away from sensitive habitats, with no light spillage, in line with best

- practice for bats. Existing municipal compound areas will be utilised with sensor-based security lighting only;
- d. Construction works will be limited to daylight hours to avoid effects on bats, birds and otters. The use of construction lighting will be limited to absolute minimums. Where it is necessary, all lighting will be cowled away from sensitive habitats, with no light spillage, in line with best practice for bats. Existing municipal compound areas will be utilised with sensor-based security lighting only;
- e. The mini piling will be installed using reduced noise equipment in accordance with best practice; and
- f. Regular monitoring of the works will be provided by a suitably qualified ECoW with authority to 'Stop the Works'. The representative will have knowledge of working on construction programmes within SAC and SPA areas where significant bird populations exist.



Figure 2.3: Boyne Greenway Upstream Recycle Plastic Elements Construction.

In operation, the boardwalk section of greenway should have a negligible impact on the fauna and flora in the long term as it will generally merge into the surroundings. To limited impact, the following measures are proposed initially:

- To counteract impact from dogs, particularly, and avoid noise transfer to birds and other species which may occur, the boardwalk barrier will be screened to half height (~600m) with full height (~1200 mm), an option in particularly sensitive locations. The screening will be provided by fixing boardwalk running boards to the fence posts; and
- 2. No lighting is anticipated in the first instance, as the boardwalk section will likely only be used during daylight hours. Should operational lighting be necessary for security and safety, it will be LED based (to avoid emission of UV light) and will be cowled away from estuarine habitats with no light spillage in line with best practice for bats and birds. Low energy LED luminaires incorporating a solar power source and motion detectors will be used only. Furthermore, to minimise the requirement for lighting all access features, such as bollards and gates, shall have reflectorised strips in line with best practice guidance. No lighting will be provided where birds forage within 50 metres of the greenway to avoid any disturbance.

#### 2.1.4 Greenway Construction Bridge Sections

Bridge sections will be required at two locations along the route of the greenway to provide 20 metre clear spans. The bridging sections are over a stream (steel arch bridge - **Figure 2.4**) and surface water outfall (precast concrete beams - **Figure 2.4**).

The proposed steel arch bridge will be a prefabricated steel arch bridge placed on precast concrete cross beams on precast concrete piles (see **Figure 2.5**). This construction form was agreed through discussions with the architectural heritage department of Meath County Council to limit impact on the existing stone arch bridge structure and not detract from the bridge visually.

The proposed precast concrete beams bridge will be a simpler option, formed by providing a prestressed precast concrete beam resting on a precast concrete ground beam on precast concrete piles. The deck will be partially precast with in-situ finished surface (see **Figure 2.6**).

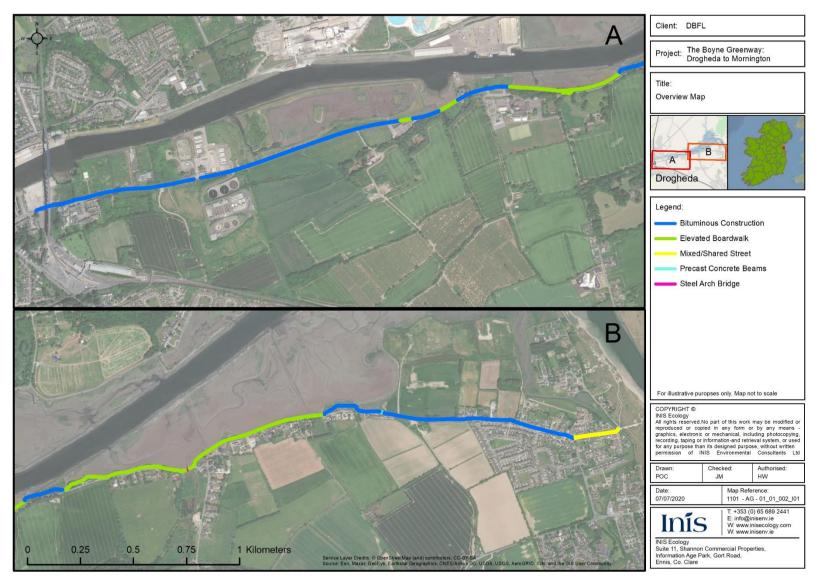


Figure 2.4: Construction methods for the proposed Boyne Greenway.





Figure 2.5: Typical Prefabricated Steel Arch Bridges.





Figure 2.6: Typical Precast Concrete Bridges.

#### 2.1.5 Monitoring Commitment

The effectiveness of the intrinsic design measures will be monitored during construction and post construction for 3 years. Monitoring during construction will be undetaken by a suitably qualified Ecological Clerk of Works, (ECoW) with a 'Stop Works' authority. This ecologist will have previous experience and extensive knowledge of working on construction programmes within SAC and SPA areas with significant bird populations.

The importance of the Annex species listed for the SPA requires that on-going monitoring of the greenway corridor is required during construction and for a number of years post construction to prove that birds are not displaced such that the integrity of the Natura Sites is affected negatively.

The monitoring shall test the effectiveness of the proposed design measures for the new greenway using actual bird survey counts and behaviour analysis. A report of each inspection shall be prepared and reviewed at the start and finish of each season the greenway is active. The ecologist/ornithologist shall, where necessary, recommend adaptive measures to be implemented by the greenway management team and provide advice during the implementation of measures and further monitor the effectiveness of any adaptive measures once deployed. The performance of the particular measures of importance shall be observed, such as the durability of the fencing erected, the effectiveness of any screening and feeding habits of birds adjacent to the screens.

# 3 Methodology

# 3.1 Appropriate Assessment Guidance

EU and national guidance exist in relation to Member States' fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in relation to this AA has had regard to the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.
   Department of Environment, Heritage and Local Government (DoEHLG, 2010);
- Communication from the Commission on the Precautionary Principle (European Commission, 2000);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (known as MN2000), Office for Official Publications of the European Communities, Luxembourg (European Commission, 2018);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (European Commission, 2002);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC Clarification of the
  concepts of: alternative solutions, imperative reasons of overriding public interest,
  compensatory measures, overall coherence, opinion of the Commission (European Comission,
  2007);
- Nature and biodiversity cases: Ruling of the European Court of Justice (European Commission, 2006);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (European Commission, 2013); and

• Article 6 of the Habitats Directive: Rulings of the European Court of Justice (Sundseth & Roth, 2014).

# 3.2 Ecological Data

#### 3.2.1 Desk study

A desk study was completed to assess the potential for all Qualifying Interests (QI) and Special Conservation Interests (SCI) of European sites to occur, given their ecological requirements identified by Balmer *et al.* (2013) for SCIs, and the National Parks and Wildlife Service (NPWS) for QIs (NPWS, 2019a, b, c). SCI Birds and mobile QI species can travel many kilometers from their core areas, and desktop surveys assessed the potential presence of such species beyond the European sites for which they are QIs/SCIs. Desktop studies had particular regard for the following sources:

- Tabulated lists for all European sites in Ireland of SCIs and QIs, obtained through NPWS;
- Information on ranges of mobile QI populations in Volume 1 of NPWS' Status of EU Protected Habitats and Species in Ireland ((NPWS, 2019), and associated digital shapefiles;
- Information on ranges of mobile SCIs bird populations from Bird Atlas 2007–11 (Balmer et al., 2013); excluding birds of prey whose ranges were determined with reference to Hardey et al. (2013);
- Mapping of European site boundaries and Conservation Objectives for relevant sites and beyond, as relevant, available online from the NPWS;
- Distribution records for QI and SCI species of European sites held online by the National Biodiversity Data Centre (NBDC)<sup>1</sup>;
- Details of QIs/SCIs of European sites within the National Biodiversity Action Plan 2017-2021 (DoCHG, 2017);
- Data including surface and ground water quality status, and river catchment boundaries available from the online database of the Environmental Protection Agency (EPA)<sup>2</sup>;
- Information on groundwater aquifers, recharge, and vulnerability available from the online database of Geological Survey Ireland (GSI)<sup>3</sup>;
- National and regional surveys of semi-natural habitats, including grasslands (O'Neill et al., 2013), saltmarsh (Devaney & Perrin, 2015; Mccorry et al., 2009), and woodland (Perrin et al., 2008); and
- Boundaries for catchments with confirmed or potential freshwater pearl mussel (FWPM) Margaritifera margaritifera populations in GIS format available online from the NPWS<sup>4</sup>.

<sup>&</sup>lt;sup>1</sup>Available at https://maps.biodiversityireland.ie/Map. Accessed in May 2020.

<sup>&</sup>lt;sup>2</sup> Available at <a href="https://gis.epa.ie/EPAMaps/">https://gis.epa.ie/EPAMaps/</a>. Accessed in May 2020.

<sup>&</sup>lt;sup>3</sup> Available at <a href="https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx">https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx</a>. Accessed in May 2020.

<sup>&</sup>lt;sup>4</sup> Available at https://www.npws.ie/maps-and-data/habitat-and-species-data. Accessed in May 2020.

#### 3.2.2 Field Study

## 3.2.2.1 Habitats and Volant Mammals

An ecological walkover survey of the proposed Greenway route was completed in April 2018. This was within the optimal mammal field survey season but outside the optimal botanical survey season. The survey was undertaken in accordance with Smith et al. (2011) and habitats within 50m of the route were classified according to Fossitt (2000). Annex I habitat evaluations were cross referenced with the NPWS conservation objectives for the Boyne Coast and Estuary SAC (NPWS, 2012b), including mapping provided in the Supporting Documents<sup>5</sup>. Determinations were made during the field survey with regard to saltmarsh communities aligning with Annex I habitats listed as QIs for the site and where non-Annex habitat occurred within and outside of the SAC boundary. Searches for evidence of protected species and/or presence of suitable supporting habitats were also undertaken – in particular in relation to Bats.

#### 3.2.2.2 Non-Volant Mammals

A mammal survey was completed of the lands within 50m of the route, with specific searches for field signs indicating the presence of otter (slides, spraints, couches, prints and holts) and also badger activity (pathways, hairs, latrines, snuffle holes, setts, and prints). A search for signs of badger activity and badger setts was carried out within a 50m buffer of the route. However, if applicable where evidence of badger activity was high, searches extended outside of this buffer.

#### 3.2.2.3 Birds

Initial scoping and consultation, including with NPWS, highlighted the requirement for any route design and later evaluation to take cognisance of interaction with shorebird populations along the route. In line with this and to ensure a robust, up-to-date baseline was available to inform a reasoned analysis of effects, bespoke surveys of shorebirds were undertaken within the intertidal sections of the proposed route. The objective of the bird survey was to supplement and update previously conducted studies for which results are available in the public domain (i.e. annual Irish Wetland Bird Surveys (I-WeBS) and Low Tide (LT) surveys (undertaken in 2011/2012; NPWS, 2012b). All these surveys incorporate a roving 'look-see' method (Bibby et al., 2000), where the observer moves from one count unit to the next over a set period to coincide with rising/falling tides, which is unsuitable in this instance to allow a full evaluation of site usage -in addition the passage of time in the interim since these studies intimated that a more up-to-date baseline was required. The current survey method was designed to provide more detailed and up-to-date information on hourly distribution of feeding and foraging birds, in particular in previously established 'count-sectors' in proximity to the proposed Greenway route, and across the tidal cycle thus providing up-to-date, definitive findings with which to inform route design and evaluate the significance of any effects.

Bird counts were completed at defined vantage points (n=6 were required to fully cover the 5 subsites; see **Table 3.1** and **Figure 3.1**) which allowed visibility in 180 degrees of the relevant count sectors. In

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<sup>&</sup>lt;sup>5</sup> Available at https://www.npws.ie/protected-sites/sac/001957. Accessed in May 2020.

any given day, a single count sector was surveyed across a 6-hour period. Target notes were made on other sectors during each count, if pertinent. Timings had to include, in at least one instance per count sector, a high tide (HT) period to allow the geo-referencing of HT roosts. Knowledge of the tidal cycle pertinent to the site was, therefore, required. Furthermore, timings and days selected for surveys covered the tidal cycle (e.g. from LT to HT, HT to LT or mid flood to mid ebb, etc.), to establish a baseline for each count sector the proposed route passes through across varying states of the tidal cycle.

Table 3.1: Count sectors (subsites) and sector codes (after NPWS, 2012b).

SubSite_Code	Subsite
0ZL02	Arp
0ZL03	Port to Beaulieu
0ZL05	Beaulieu Pier to Mornington
0VL01	Mornington West
0VL02	Mornington East

Hourly counts (across the tidal cycle and within pre-defined count sectors) to plot distribution/numbers of foraging and roosting birds within the likely zone of effect of the proposed Greenway corridor were undertaken. As the proposed Greenway effectively 'hugs' the shoreline, particular emphasis was given to plotting the distribution and numbers of feeding or roosting birds within specific distance bands (i.e. the likely zone of effect). Counts took place on a total of 12 days in in winter period (March) 2018. Each count sector was counted on at least two occasions.

To establish numbers/distribution/usage of the likely zone of effect of the proposed development, locations within distance bands out to 50m from the proposed Greenway route were plotted as accurately as possible on field maps. In addition to numbers for each bird species, data on the location of birds in relation to the proposed route (within 50m; between 50m and 100m and over 100m away) were recorded, as well as the behaviour of the birds (noted as either foraging or roosting/other) and habitat type they were using (either intertidal, subtidal, supratidal or terrestrial).

As well as the birds themselves, notes were also taken in relation to disturbance events recorded during the survey period that affected the birds observed, to establish any baseline trends of note. Disturbance event data included information on the disturbance type, response of the birds to the disturbance event and the duration of the disturbance event. The presence of birds of prey (that may also cause disturbance to shorebirds) was also noted.

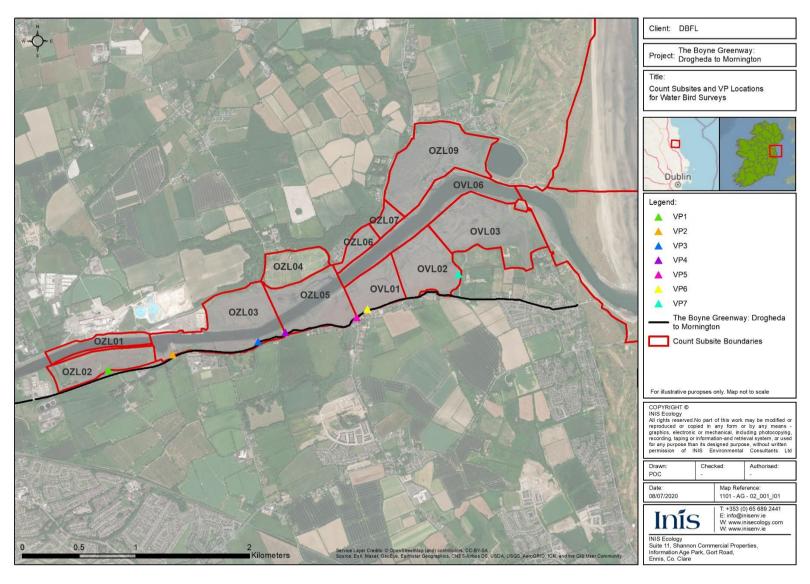


Figure 3.1: VP Locations for Water Birds Surveys.

#### 3.2.3 Relevant European Sites

The identification of relevant European sites to be included in this report was based on the identification of the Zone of Influence (ZoI) of the proposed turbulence felling, a source-pathway-receptor model of effects, and the likely significance of any identified effects.

#### 3.2.4 Zone of Influence

The proximity of the proposed development area to European sites, and more importantly QIs/SCIs of European sites, is of importance when identifying potentially likely significant effects. During the initial scoping of this report, a 15 km ZoI was applied for impact assessment. A conservative approach has been used, which minimises the risk of overlooking distant or obscure effect pathways, while also avoiding reliance on buffer zones within which all European sites should be considered. This approach assesses the complete list of all QIs/SCIs of European sites in Ireland (i.e. potential receptors), instead of listing European sites within buffer zones. This follows Irish departmental guidance on AA:

"For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects" (DoEHLG, 2010, p. 32).

Following the guidance set out by the National Roads Authority (NRA, 2009), the proposed development has been evaluated based on an identified ZoI with regard to the potential impact pathways to ecological features (e.g. mobile and static). The ZoI of the proposed development on mobile species (e.g. birds, mammals, and fish), and static species and habitats (e.g. saltmarshes, woodlands, and flora) is considered differently. Mobile species have 'range' outside of the European site in which they are QI/SCI. The range of mobile QI/SCI species varies considerably, from several meters (e.g. in the case of whorl snails *Vertigo* spp.), to hundreds of kilometers (in the case of migratory wetland birds). Whilst static species and habitats are generally considered to have ZoIs within close proximity of the proposed development, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or plant is located many kilometers downstream from a pollution source.

Hydrological linkages between the proposed development and European sites (and their QIs/SCIs) can occur over significant distances; however, any effect will be site specific depending on the receiving water environment and nature of the potential impact. A reasonable worst-case ZoI for water pollution from the proposed felling site is considered to be the surface water sub-catchment, wherein the proposed works are to be located.

The likely effects of the proposed development on European sites has been appraised using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed development that has the potential to impact on an European site, its qualifying features and its conservation objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and

• A 'receptor' is defined as the Special Conservation Interests of Special Protection Areas (SPA) or Qualifying Interests (QI) of Special Areas of Conservation (SAC) for which Conservation Objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potentially links to European sites. These are termed as 'relevant' European sites/QIs/SCIs throughout this report.

## 3.2.5 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is considered as being above *a de minimis* level<sup>6</sup>. The opinion of the Advocate General in CJEU case C-258/11 outlines:

"the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill."

In this report, therefore, 'relevant' European sites are those within the potential ZoI of activities associated with the proposed development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

# 3.3 Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

- Determining whether a project or plan is directly connected with or necessary to the conservation management of any European sites;
- Describing the project or plan;
- Identifying the European sites potentially affected by the project or plan;
- Identifying and describing any potential effects of the project or plan on European sites, alone, in-combination and cumulatively with other plans/projects; and
- Assessing the likelihood of significant effects on European sites.

<sup>6</sup> Sweetman v. An Bord Pleanála (Court of Justice of the EU, case C-285/11). A de minimis effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present on a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be likely significant effects.

# 3.4 Consultation

A chronology of the consultation undertaken by Inis Environmental consultations is provided below in **Table 3.2**.

**Table 3.2: Consultation Correspondence.** 

Date of Consultation	Method	Parties involved	Topic	
18/05/18	Telephone	Chris Cullen of Inís Environmental and Dr. Linda Patton of NPWS, Dept. Culture, Heritage and the Gaeltacht.	Boyne Greenway preconsultation meeting. Dr. Patton commented to send in a meeting request with mention of routing it to herself on DATS.	
18/05/18	Email	Chris Cullen of Inís Environmental Consultants to DAU.	Request of consultation meeting in respect of Project Reference: G Pre00202/2017 (Proposed cycle/walkway greenway route along the South banks of the River Boyne, Drogheda, Co. Meath).	
21/05/18	Email	DAU to Chris Cullen of Inís Environmental	Acknowledgement of receipt of email.	
27/09/18	Meeting at Knocksink Wood Education Centre	Inís Environmental Consultants, Meath County Council and NPWS Attendees: Cormac Ross (CR) of Meath County Council (MCC). Howard Williams (HW) and Chris Cullen (CC) of Inís Environmental Consultants. Dr. Linda Patton (LP) of NPWS, Dept. Culture, Heritage and the Gaeltacht.	Discuss the Boyne Greenway.	
10/10/18	Email	Sinead Ryan of DAU to Chris Cullen of Inís Environmental.	Acknowledgement of receipt of meeting minutes.	

# 4 Receiving Environment

## 4.1 Desk Study

#### 4.1.1 Terrestrial Biodiversity

#### 4.1.1.1 Habitats and Flora

An online search was undertaken of data contained in the National Biodiversity Data Centre records base<sup>7</sup>. Data from an area of 2 km surrounding the proposed route was analysed for the presence of terrestrial flora and fauna records; where this radius was considered to incorporate the extent of local ecological interests potentially occurring within the ZoI of the proposed development. A total of five 2 km² grid squares was searched to cover the linear extent of the proposed route. This desk-based review included a wider study area than the field survey, which was focussed on the footprint of the proposed works and potential indirect effects associated with the construction and operation of the Greenway.

A single record of the endangered moss species Pointed Beard-moss (*Didymodon acutus*) occurs within the wider study area, recorded from the northern side of the estuary, approximately 1km from the proposed route. The near-threatened moss Side-fruited Crisp-moss (*Pleurochaete squarrosa*) has also been recorded within the 100 m<sup>2</sup> grid squares that are located adjacent to the proposed route.

#### 4.1.1.2 **Invasive Species**

Based on existing records, there are seven locations of Japanese Knotweed (*Fallopia japonica*) to the west of the viaduct in Drogheda town, occurring mainly within housing estates in the Drogheda area, outside of the proposed route 50 m buffer zone. Japanese knotweed is classed as a high impact invasive species and is listed on the Third Schedule of the Birds and Natural Habitats Regulations (2011) and is subject to control and management requirements.

There are single records of Common Cord-grass from 2014 (*Spartina anglica*), Giant Hogweed (*Heracleum mantegazzianum*) and *Rhododendron ponticum* within 2km of the proposed route, these species are high impact species and are subject to control under the Birds and Natural Habitats Regulations (2011). There is a single record of Sea-Buckthorn, which is a medium impact invasive species; however, it is listed on the third schedule of the Birds and Natural Regulations (2011) and is subject to control and management. There is one record of Butterfly-bush (*Buddleja davidii*), six records of Sycamore (*Acer pseudoplatanus*) and one record of Japanese Rose within 2 km of the proposed route. These species are classed as medium impact invasive and are not listed on the third Schedule of the Birds and Natural Habitats Regulations (2011) and thus are not subject to control and management requirements. There is a record of Cherry Laurel (*Prunus laurocerasus*) within the study area from 2005. This species is classed as 'high impact'; however, it is not listed on the Birds and Natural Habitats Regulations (2011) and thus is not subject to control and management requirements.

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<sup>&</sup>lt;sup>7</sup> Available at http://www.biodiversityireland.ie/. Accessed in May 2020.

#### 4.1.1.3 Fauna

#### 4.1.1.3.1 Mammals

The NBDC data records for the study area were evaluated for the grid squares overlapping the proposed route corridor. There is a total of 13 observations of Daubenton's Bat (Myotis daubentonii), one observation of Brown Long-eared Bat (Plecotus auritus), three observations of Lesser Noctule (Nyctalus leisleri), five Pipistrelle spp. and seven Soprano Pipistrelle (Pipistrellus pygmaeus) within the study area. All bat species in Ireland are protected under the Annex IV of the EU Habitats Directive (1992) and the Wildlife Act (2000).

There are eight records of Badger (*Meles meles*) and 20 records of Hedgehog (*Erinaceus europaeus*) within the study area; both species are protected under the Wildlife (Amendment) Act. There are 13 records of Otter (*Lutra lutra*) identified; this species is protected under the Wildlife Act (2000), is listed on Annex II and Annex IV of the EU Habitats Directive (1992) and is included as a qualifying interest of the River Boyne and River Blackwater SAC, which adjoins the western portion of the proposed route corridor. There is a single record of Irish Hare (*Lepus timidus ssp. hibernicus*) within the study area from 2009; this species is also protected under the Wildlife Act (2000).

There are three records of Harbour Seal (*Phoca vitulina*) within the study area, this species is listed on Annex II and Annex V of the European Habitats Directive. A single record of Common Dolphin (*Delphinus delphis*) and Striped Dolphin (*Stenella coeruleoalba*) were noted on the northern side of the estuary. All marine cetacean species are designated for conservation under Annex IV of the EU Habitats Directive as well as the Wildlife Act.

There are 10 records of Grey Squirrel (*Sciurus carolinensis*), which is a species listed as a high impact invasive and is subject to control and management requirements. There are six records of Rabbit (*Oryctolagus cuniculus*) within 2 km of the proposed route, which is a medium impact invasive species. There are two records of Brown Rat (*Rattus norvegicus*) with the study area, which is a species listed as a high impact invasive but is not subject to control and management on the mainland under the Birds and Natural Habitats Regulations (2011).

#### 4.1.1.3.2 Birds

A search of bird records held by the National Biodiversity Data Centre within the 10km grid square within which the proposed route occurs was undertaken. Bird species recorded are presented in **Table 4.1** below. These species are likely associated with the coastal areas, woodland and agricultural land. All bird species in Ireland are protected under the Wildlife (Amendment) Act 2000, with additional conservation designation afforded for species listed on Annex I of the EU Birds Directive (2009), with further species listed on Annex II and Annex III of this Directive. In Ireland, Birdwatch Ireland and the Royal Society for the Protection of Birds (RSPB NI) publish the Birds of Conservation Concern in Ireland (BoCCI) list (Colhoun & Cummins, 2013) of priority bird species for conservation action on the island of Ireland. This includes birds which breed and/or winter in Ireland categorised as Red, Amber and Green, based on the conservation status of the bird and hence conservation priority.

Table 4.1: Records of birds of conservation concern for the wider study area.

able 4.1: Records of birds of conservation concern for the wider study area.  Date of Conservation Designation				
Species	Record	Birds Directive	BoCCI	
Arctic Tern (Sterna paradisaea)	31/12/2001	Annex I	Amber	
Common Tern (Sterna hirundo)	31/12/2009	Annex I	Amber	
Barn Owl (Tyto alba)	31/12/2011		Red	
Barn Swallow ( <i>Hirundo rustica</i> )	12/06/2017		Amber	
Bar-tailed Godwit (Limosa lapponica)	31/12/2011	Annex I	Amber	
Black-headed Gull (Larus ridibundus)	12/06/2017		Red List	
Black-legged Kittiwake (Rissa tridactyla)	31/12/2001		Amber	
Black-tailed Godwit (Limosa limosa)	31/12/2011		Amber	
Brent Goose (Branta bernicla)	04/12/2017	Annex II	Amber	
Common Goldeneye ( <i>Bucephala clangula</i> )	31/12/2011	Annex II	Red	
Common Grasshopper Warbler (Locustella naevia)	31/07/1972		Amber	
Common Greenshank (Tringa nebularia)	04/12/2017		Amber	
Common Guillemot ( <i>Uria aalge</i> )	05/08/1998		Amber	
Common Gull (Larus canus)	31/12/2011		Amber	
Common Kestrel (Falco tinnunculus)	31/12/2011		Amber	
Common Kingfisher (Alcedo atthis)	05/09/2016	Annex I	Amber	
Common Linnet (Carduelis cannabina)	04/12/2017		Amber	
Common Pochard (Aythya ferina)	31/12/2001	Annex II/III	Amber	
Common Redshank (Tringa totanus)	31/12/2011		Red	
Common Sandpiper (Actitis hypoleucos)	31/12/2001		Amber	
Common Scoter ( <i>Melanitta nigra</i> )	31/12/2011	Annex II/III	Red	
Common Shelduck ( <i>Tadorna tadorna</i> )	12/06/2017		Amber	
Corn Crake ( <i>Crex crex</i> )	31/07/1972	Annex I	Red	
Dunlin (Calidris alpina)	31/12/2011	Annex I	Amber	
Eurasian Curlew (Numenius arquata)	04/12/2017	Annex II	Red	
Eurasian Oystercatcher (Haematopus ostralegus)	04/12/2017		Amber	
Eurasian Teal ( <i>Anas crecca</i> )	31/12/2011	Annex II/III	Amber	
Eurasian Tree Sparrow (Passer montanus)	31/12/2011		Amber	
Eurasian Wigeon (Anas penelope)	04/12/2017	Annex II/III	Amber	
Eurasian Woodcock <i>(Scolopax rusticola)</i>	31/12/2011	Annex II/III	Amber	
European Golden Plover (Pluvialis apricaria)	31/12/2011	Annex II/III	Red	
European Shag (Phalacrocorax aristotelis)	12/06/2017		Amber	
Gadwall (Anas strepera)	31/12/2011	Annex II	Amber	
Goosander (Mergus merganser)	31/12/2011	Annex II	Amber	
Great Black-backed Gull (Larus marinus)	12/06/2017		Amber	
Great Black-backed Gull (Larus marinus)	12/06/2017		Amber	
Great Cormorant (Phalacrocorax carbo)	12/06/2017		Amber	
Great Crested Grebe (Podiceps cristatus)	31/12/2011		Amber	
Great Northern Diver (Gavia immer)	31/12/2011	Annex I	Amber	
Greater Scaup (Aythya marila)	31/12/2011	Annex II/III	Amber	
Greater White-fronted Goose (Anser albifrons)	31/12/2001	Annex I/II/III	Amber	
Grey Partridge (Perdix perdix)	31/07/1972	Annex II/III	Red	
Grey Plover (Pluvialis squatarola)	31/12/2011		Amber	
Greylag Goose (Anser anser)	31/12/2011	Annex II/III	Amber	

Species	Date of	Conservation Designation	
Species	Record	Birds Directive	BoCCI
Hen Harrier (Circus cyaneus)	31/12/2011	Annex I	Amber
Herring Gull (Larus argentatus)	12/06/2017		Red
House Martin (Delichon urbicum)	31/12/2011		Amber
House Sparrow (Passer domesticus)	31/12/2011		Amber
Jack Snipe (Lymnocryptes minimus)	31/12/2011	Annex II/III	Amber
Lesser Black-backed Gull (Larus fuscus)	31/12/2011		Amber
Lesser Whitethroat (Sylvia curruca)	31/12/2011		Amber
Little Egret (Egretta garzetta)	12/06/2017	Annex I	Green
Little Grebe (Tachybaptus ruficollis)	31/12/2011		Amber
Little Tern (Sternula albifrons)	31/12/2011	Annex I	Amber
Manx Shearwater (Puffinus puffinus)	05/08/1998		Amber
Mediterranean Gull (Larus melanocephalus)	31/12/2001	Annex I	Amber
Merlin (Falco columbarius)	31/07/1991	Annex I	Amber
Mute Swan ( <i>Cygnus olor</i> )	12/06/2017		Amber
Northern Gannet (Morus bassanus)	31/12/2011		Amber
Northern Lapwing (Vanellus vanellus)	04/12/2017	Annex II	Red
Northern Pintail ( <i>Anas acuta</i> )	31/12/2011	Annex II/III	Red
Northern Shoveler (Anas clypeata)	31/12/2011	Annex II/III	Red
Northern Wheatear (Oenanthe oenanthe)	06/09/2017		Amber
Red Knot (Calidris canutus)	31/12/2011		Red
Red-throated Diver (Gavia stellata)	31/12/2011	Annex I	Amber
Ringed Plover (Charadrius hiaticula)	12/06/2017		Amber
Ruff (Philomachus pugnax)	31/12/2001	Annex I	Amber
Sand Martin ( <i>Riparia riparia</i> )	05/04/2016		Amber
Sandwich Tern (Sterna sandvicensis)	11/07/2016	Annex I	Amber
Short-eared Owl (Asio flammeus)	31/12/2011	Annex I	Amber
Sky Lark ( <i>Alauda arvensis</i> )	31/12/2011		Amber
Spotted Flycatcher (Muscicapa striata)	31/12/2011		Amber
Stock Pigeon (Columba oenas)	31/12/2011		Amber
Tufted Duck (Aythya fuligula)	31/12/2011	Annex II/III	Amber
Water Rail (Rallus aquaticus)	31/12/2011		Amber
Whinchat (Saxicola rubetra)	31/07/1991		Amber
Whooper Swan (Cygnus cygnus)	31/12/2011	Annex I	Amber
Yellowhammer (Emberiza citrinella)	31/12/2011		Red

#### 4.1.1.3.3 Reptiles and Amphibians

With the 2km grid square to the west of the viaduct in Drogheda, there is a single record each for Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*); both species are protected under the Wildlife (Amendment) Act (2000), while the Common Frog is also listed on Annex V of the EU Habitats Directive. There are three records of Common Lizard within the study area; this is expected in areas where dry, south-facing coastal dunes and suburbs provide suitable habitat for this species.

#### 4.1.1.3.4 Invertebrates

There are four records of the Red Data List *near-threatened* beetle species *Ochthebius* (*Ochthebius*) *marinus* within the study area. There is a record of the near threatened butterfly, Small Heath, to the north of the sand dune system at Mornington. No records of Small Heath occur within 50m of the proposed route. The following near-threatened species were also recorded within the study area; Two records of *Andrena* (*Leucandrena*) *barbilabris* from 2010, two records of *Colletes* (*Colletes*) *similis*, two records of Large Red-Tailed Bumble Bee (*Bombus* (*Melanobombus*) *lapidarius*), four records of Moss Carder-bee (*Bombus* (*Thoracombus*) *muscorum*) and two records of Osmia (*Helicosmia aurulenta*). A total of four records of Northern Colletes (*Colletes*) *floralis*); this species is classified as vulnerable.

#### 4.1.2 Fisheries and Aquatic Biodiversity

The study area for the proposed Greenway follows the southern margin of the Boyne Estuary, Hydrometric Area 07, due east of Drogheda town to its mouth on the east coast at Mornington. The lands crossed by the proposed development drain in a northerly direction into the Boyne Estuary.

In general, the site has been modified somewhat by human activity, such as on-going dredging for shipping. A number of factories are also present along the river, upstream of the estuary. The Boyne River channel, which is navigable and dredged, is defined by training walls that are breached in some places. Intertidal flats occur on the sides of the river channel. The sediments vary from fine muds in the sheltered areas to sandy muds or sands towards the river mouth (J. Kelly et al., 2008).

The EU Water Framework Directive (WFD) status (2013-2018) for the Boyne estuary (IE\_EA\_010\_0100) is characterised as 'Moderate', with specific regard to phytoplankton, macroalgae, nutrient conditions and poor hydromorphological conditions<sup>8</sup>. However, fish and invertebrate status are classed as 'Good'. The Boyne Estuary discharges to the Boyne Estuary Plume Zone waterbody (IE\_EA\_010\_0000), characterised as at 'Moderate' status, including high biological status and nutrient conditions, but 'Moderate' status for phytoplankton, supporting chemistry conditions and oxygenation<sup>9</sup>.

The Boyne Estuary was surveyed by Inland Fisheries Ireland as part of the WFD Fish programme in 2009 (Fiona Kelly et al., 2009). A total of 23 fish species (sea trout are included as a separate 'variety' of trout) were recorded in the Boyne Estuary. Juveniles of a number of commercially important species were present, including cod, plaice and herring, as well as other species of angling importance, including flounder, sea trout and thick-lipped grey mullet. The diversity of species present reflects the salinity gradient and variety of habitat in the Boyne Estuary from more freshwater/brackish conditions in its upper reaches to more saline conditions closer to the sea. Additional monitoring surveys were completed as part of the same programme in 2012 (F. Kelly et al., 2013) which also identified 23 species of fish; however, in 2012, fifteen-spined stickleback, stone loach and two-spotted goby were recorded, while herring, thick-lipped grey mullet and whiting were recorded in the 2009 surveys, but not in 2012.

<sup>9</sup> Available at <a href="https://www.catchments.ie/data/#/waterbody/IE EA 010 0000? k=liwvvl">https://www.catchments.ie/data/#/waterbody/IE EA 010 0000? k=liwvvl</a>. Accessed in May 2020.

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<sup>&</sup>lt;sup>8</sup> Available at <a href="https://www.catchments.ie/data/#/waterbody/IE\_EA\_010\_0100?\_k=vzq3oe">https://www.catchments.ie/data/#/waterbody/IE\_EA\_010\_0100?\_k=vzq3oe</a>. Accessed in May

# 4.2 Field Survey

The study area is located in the upper portion of the Boyne Estuary extending east from Drogheda Town. Therefore, there is hydrological connectivity between the study area and the River Boyne and River Blackwater SAC (upstream) and the Boyne Coast and Estuary SAC (downstream). An ecological walkover survey of the proposed Greenway route was completed in April 2018, which involved habitat mapping and general mammal survey, as well as a targeted habitat assessment for potential occurrence of the Annex II listed Otter and the Annex I listed Kingfisher. A variety of habitats were recorded along the proposed route with Upper Salt Marsh, Lower Saltmarsh, Mud Flats and Improved Grasslands most frequently recorded in the western and central portion. Fixed Sand Dunes and Buildings and Artificial Surfaces were common in the eastern portion. The invasive species Japanese Knotweed, which is listed on the Third Schedule of the Birds and Natural Habitats Regulations (2011), was identified within the study area during the site visit (Figure 4.7).

Hedgerows and trees within proximity to the proposed development have potential for foraging and commuting bats; however, no suitable features comprising bat roost potential were identified within the route corridor. Similarly, no suitable nesting or foraging Kingfisher habitat was found within the development area. The habitats within the development area were found to be of medium potential for Otter; one Otter spraint was recorded within the study area.

#### 4.2.1 Habitats and Flora

## 4.2.1.1 Habitat Description Along Proposed Route

The proposed Greenway commences approximately 100 metres west of the viaduct in Drogheda Town and follows the corridor of the R150 road within the roadside grassy verges (**Figure 4.1**). This section the route will be constructed from bituminous pavement.



**Figure 4.1:** Regional road R150 with grass verge and wall in the foreground and mud flats in the background.

Just east of the Drogheda Grammar School, the route crosses an area of species poor Amenity Grassland (GA2 - Yorkshire Fog *Holcus Ianatus*, Ribwort Plantain *Plantago Ianceolata*, Daisy *Bellis* 

perennis and Dandelion *Taraxacum spp*), just across Upper Saltmarsh (CM2) habitat. This small section of the Boyne Greenway (*ca.* 60m) will be constructed using recycled plastic boardwalk. The Boyne Greenway route intersects the River Boyne and River Blackwater SAC and the Boyne Estuary SPA boundaries along this boardwalk section (**Figure 4.8**).

From the boardwalk mentioned above and already outside the SAC and SPA boundaries, another bituminous section follows the road margin, incorporating Amenity Grassland habitat (GA2). Arriving at an area where the R150 road is separated by Saltmarsh habitat (CM1 and CM2) by a grassed verge and a wall (**Figure 4.1**), the Boyne Greenway construction type reverts to recycled plastic boardwalk (*ca.* 103m). This section crosses estuarine muddy shoreline habitat (LS4) to the north of the Greenway corridor.

The route reverts to bituminous construction, intersecting habitats of lower ecological value (e.g. BL3, GA2, WS1). Still within the bituminous section, Scattered trees and parkland habitat (WD5) is crossed, with Ash trees (*Fraxinus excelsior*). At this section, the route intersects again the River Boyne and River Blackwater SAC and the Boyne Estuary SPA (**Figure 4.8**). The majority of trees within this habitat have low bat roost suitability and may need to be removed to allow access from the road corridor. On the southern side of the road, within the grounds of Drogheda Grammar School, there are a number of mature trees with low bat roosting potential. These trees are within the grounds of the school and will not be affected by the proposed route (**Figure 4.2**).



**Figure 4.2:** Example amenity grassland (GA2) and treelines (WL2) recorded outside Drogheda Grammar School.

From this point west, still within the WD5 habitat, the route transitions to boardwalk, continuing crossing habitats of Amenity Grassland (GA2). The habitats comprise scattered trees and parkland WD5 and GA2.

Moving east, still within the SAC and SPA boundaries, the Boyne Greenway changes to boardwalk construction and crosses estuarine muddy shoreline habitat to the north of the greenway corridor (CM2, FS1), while its majority is located within broadleaved woodland (WD1) and scrub (WS1) habitats (Figure 4.9). The woodland habitat (WD1) and mature treeline habitats are characterised by the presence of Beech (Fagus sylvatica), Horse Chestnut (Aesculus hippocastanum) and mature Hawthorn (Crataegus monogyna). Scrub (WS1) habitat is characterised by Willow spp. (Salix spp.) and European

Gorse (*Ulex europaeus*), with a small section within reedbed (FS1) composed of Common Reed (*Phragmites australis*). Trees occurring within these habitats have low bat roost suitability.

Continuing east, the route changes to bituminous type and runs parallel to the R150 road, outside the River Boyne and River Blackwater SAC but still within the Boyne Estuary SPA boundary, for approximately 125m. It re-enters the SAC and continues east for approximately 60m. This section of the Boyne Greenway crosses habitats of low ecological value (e.g. BL3, WS1 and GS2), dominated by European Gorse and Bramble, and Cock's Foot grass with some Meadowsweet, respectively (**Figure 4.9**).

The Greenway type of construction changes to boardwalk, crossing a scrub area (WS1), still within the Boyne Estuary SPA and the River Boyne and River Blackwater SAC boundary, where it crosses a section of hard standing with some scrub composed of Bramble, European Gorse and Buddleia (*Buddleja* sp.). This section of hard standing has an embankment to the north, which creates a border between the proposed route and lower saltmarsh (CM1) habitat present to the north of the embankment (**Figure 4.3**). The embankment is dominated by grasses including Red Fescue (*Festuca rubra*). The route then crosses a small section of upper saltmarsh (CM2), which transitions into scrub and amenity grassland habitat to the south, closer to the road.



Figure 4.3: Road looking west showing mud flats.

**Figure 4.4:** Example of lower salt marsh (CM1) habitat recorded within the study area.

From this point, the route crosses a small section of upper saltmarsh (CM2), and borders lower salt marsh habitat (CM1) to the north (see illustrative examples in **Figure 4.5**), which is intersected further east, approximately at the location where the route crosses again the SAC and SPA's boundaries for a short length (**Figure 4.9**). The route continues east, re-entering the SAC and SPA, intersecting lower salt marsh (CM1) and, mostly, scrub habitat (WS1).



**Figure 4.5:** Example of upper salt marsh in the right of the photo and lower salt marsh (CM1) in the middle with mud flats to the left.

Further east, at a short distance from the intersection between the R151 road with the R150 road in the western direction, the Boyne Greenway route will be provided with a steel arch bridge, crossing the Stagrennan River traversing mudflat intertidal habitat (LS4) of the estuary within the SAC/SPA complex (**Figure 4.10**).

Still with boardwalk type of construction, the route then briefly leaves the SPA and SAC and crosses Amenity Grassland (GA2), re-entering the European sites shortly after (ca. 20m east), intersecting lower salt marsh (CM1) - not corresponding to Annex I Atlantic Saltmarsh — and Amenity Grassland (GA2) for ca. 705m. The route then continues east, transitioning to bituminous construction shortly after leaving the SAC and SPA boundaries. This bituminous section of ca. 290m intersects habitats of lower ecological value, as Amenity grassland (GA2), Ornamental/non-native shrub (WS3) and Dry meadows and grassy verges (GS2), mostly outside the Boyne Coast and Estuary SAC and the Boyne Estuary SPA. Approximately 180m east, the route re-enters the SAC and SPA, on Amenity grassland (GA2) habitat bordering Lower salt marsh habitat (CM1) to the north. This section is interrupted by the precast concrete beams bridge, which drives the Boyne Greenway route outside the SAC and SPA boundaries, and follows east intersecting Amenity Grassland (GA2), Improved agricultural grassland (GA1) and Buildings and artificial surfaces (BL3) habitats. This section of the route extends for ca. 910m and runs approximately parallel to the northern site of the R151 road, passing in front of gardens, grass verges and existing hard standing areas. Non-native species such as Butterfly-bush (Buddleja davidii), Montbretia (Crocosmia x crocosmiiflora), Fuschia (Fuchsia magellanica) and Wall Cotoneaster (Cotoneaster horizontalis) were commonly recorded in domestic gardens and in some hedgerows adjacent to houses.

The route then continues east, leaving the R151 Road and extending through the suburban area of Mornington (**Figure 4.11**). This section is the final section on the Boyne Greenway (i.e. the most eastern), where the construction method will consist of mixed or shared street facilities on Tower Road. This is a local/residential road, with very light traffic flows and slow traffic speeds, suitable for shared facilities. The route re-enters the Boyne Coast and Estuary SAC for the 18m of this Section, within Buildings and artificial surfaces (BL3) and Flower beds and borders (BC4) habitats.

## 4.2.1.1.1 Invasive/Non-native species

One species listed on the Third Schedule of the Birds and Natural Habitats Regulations (2011) was recorded from the study area in close proximity to the proposed development, although subject to control and management. Japanese Knotweed was recorded in one location (**Figure 4.7**) adjacent to the R150 and within <5m of the proposed route corridor. It was observed that this stand was previously treated with herbicide as only three dried canes remained.

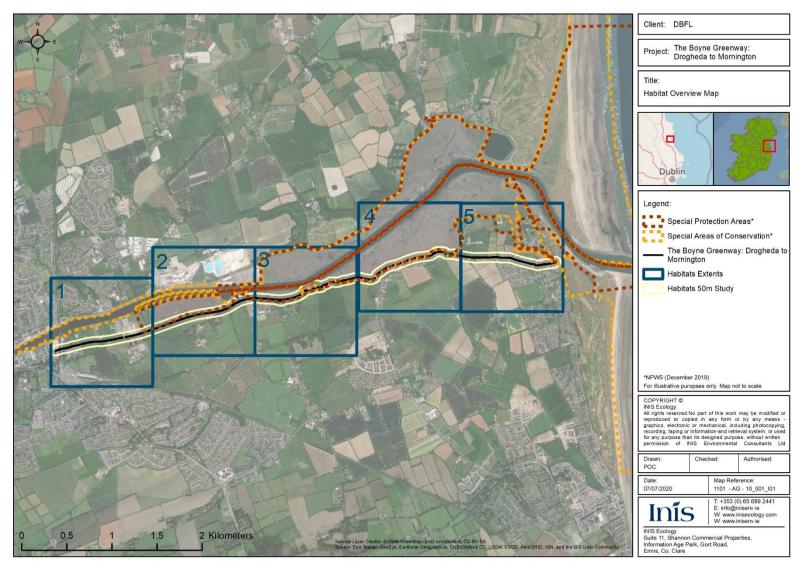


Figure 4.6: Overview location of habitat maps 1-5, showing Boyne Greenway Route and study area

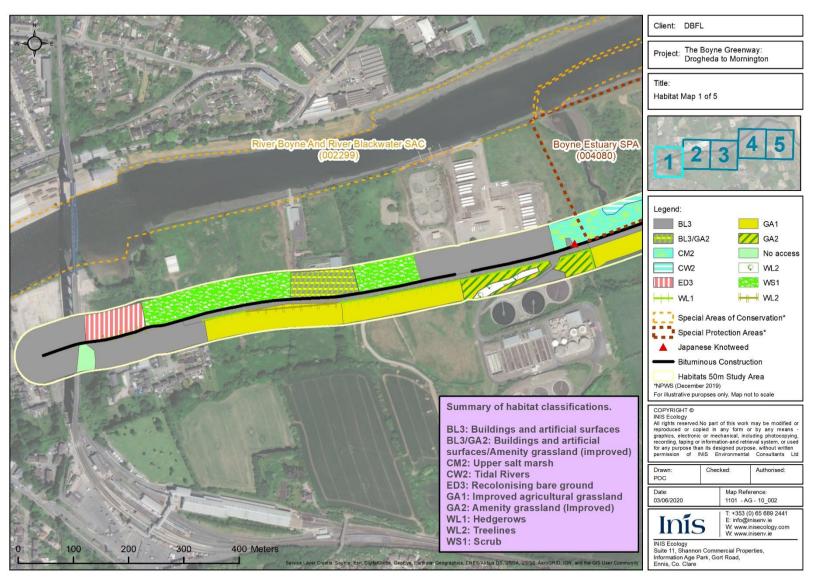


Figure 4.7: Habitats within a 50m buffer of the proposed Greenway (Map 1/5).

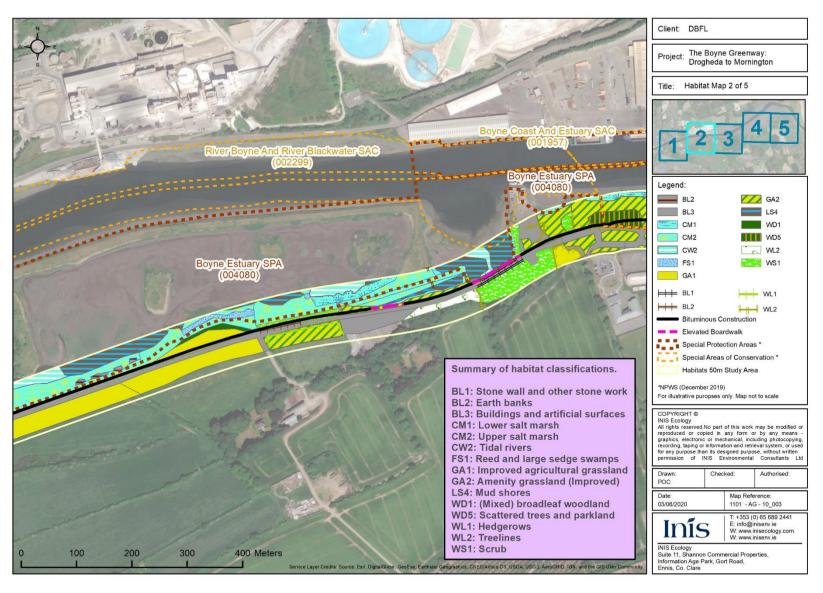


Figure 4.8: Habitats within a 50m buffer of the proposed Greenway (Map 2/5).

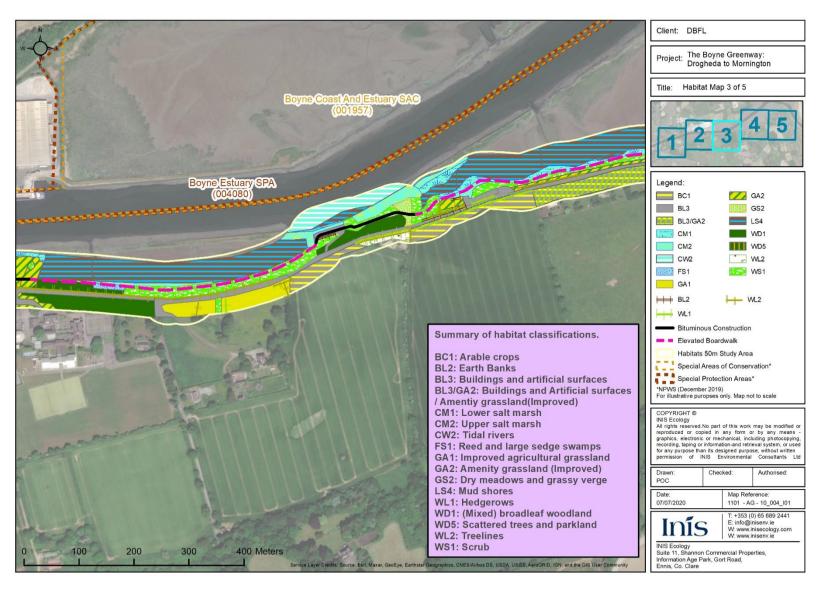


Figure 4.9: Habitats within a 50m buffer of the proposed Greenway (Map 3/5).

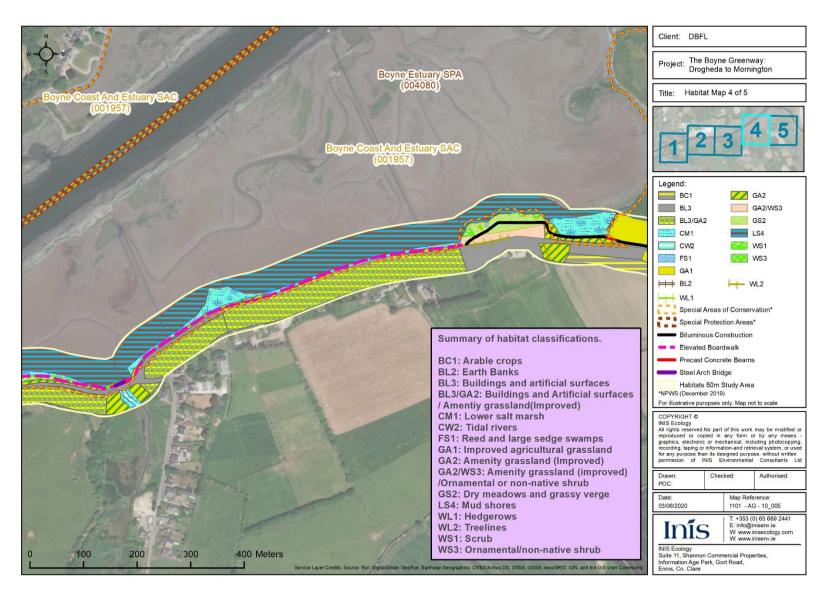


Figure 4.10: Habitats within a 50m buffer of the proposed Greenway (Map 4/5).

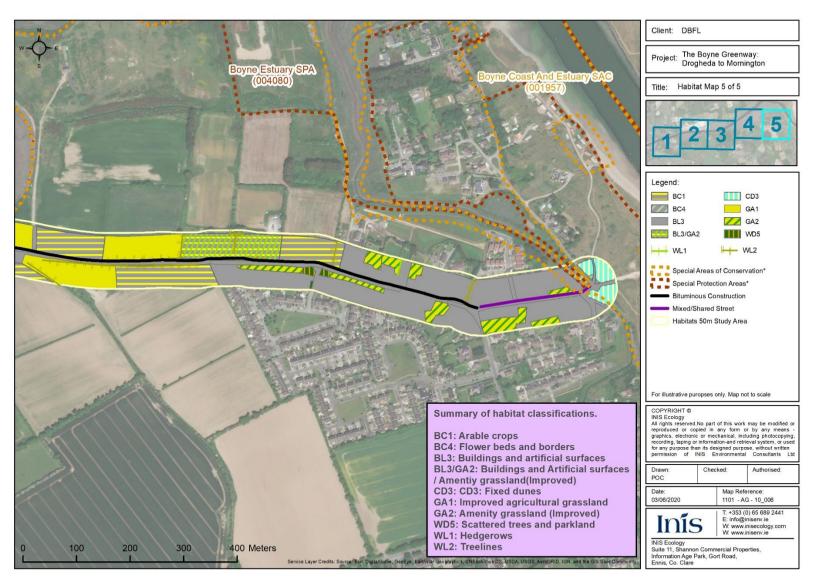


Figure 4.11: Habitats within a 50m buffer of the proposed Greenway (Map 5/5).

## 4.2.2 Terrestrial Fauna

#### **4.2.2.1** Mammals

#### 4.2.2.1.1 Bats

A visual assessment of the potential for bat habitat was completed along the proposed route corridor and included the lands immediately surrounding the proposed works. The majority of trees within the survey area were evaluated as being of negligible bat roost potential. There are a number of individual mature trees with low bat roost potential within the vicinity of Drogheda Grammar School, occurring along the road alignment. No buildings were identified as potential roost features (PRF) within the survey area. The majority of treelines recorded along the route were evaluated as having low-medium potential as foraging and commuting habitat for bats. There is a good degree of connectivity between the roadside hedgerows and treelines and to those of the adjoining field boundaries, predominantly to the south of the R150. Based on the habitats recorded, foraging and commuting bats are evaluated as likely using the habitats within the route alignment and also connected to the wider landscape.

#### 4.2.2.1.2 Otter

An old Otter spraint was recorded along the upper salt marsh within the eastern section of the study area. No other evidence of Otter such as holts, prints, feeding remains or couches were recorded following comprehensive searching. The route alignment closely follows an active road corridor, with predominantly disturbed ground and amenity grassland. Although Otters are likely to utilise the Boyne Estuary for foraging and commuting, the baseline or background disturbance levels in the receiving environment along the proposed Greenway route corridor are evaluated as a limiting factor when considering the potential for the corridor to be used for Otter breeding or holt sites.

#### 4.2.2.1.3 Badger

No evidence of Badger was recorded during the field survey. No Badger setts were identified along the proposed route. The presence of the existing roadway is likely to be a significant constraint to Badgers utilising the Greenway Route corridor from surrounding areas.

#### 4.2.2.1.4 Birds

The proposed Boyne Greenway: Drogheda to Mornington route corridor field surveys were completed in April 2018 during the breeding bird season. Dedicated wintering bird surveys of shorebirds were also completed in March 2018, during the appropriate wintering bird season. In terms of general breeding birds, the walkover survey of the route did not record any bird species of conservation interest during the breeding season. However, dedicated shorebird surveys have been completed to inform both the iterative route design process undertaken in 2018 and the subsequent impact assessment for the final project iteration. Results of these surveys, including geo-referenced distribution maps are included in full in **Appendix A** of this report.

Surveys focussed on the potential for wading and wetland birds to occur adjacent to the proposed route corridor, in association with the estuarine and intertidal habitats of the Boyne Estuary SPA. Species of conservation interest recorded during the bird surveys at high and low tide are summarised below (Table 4.2). Table 4.2 shows the maxima of birds recorded within each wintering bird survey subsite (see Table 3.1 for a breakdown of selected sub-sites). Note that, as different subsites were surveyed on different days, these numbers are not necessarily additive but may reflect birds moving onto

different subsites within the larger Boyne Estuary complex (e.g. the 2200 Golden Plover recorded at OVL01 on 12 March may be part of the same flock of 2600 recorded at OZL05 on 16 March).

Of the species recorded during fieldwork, Golden Plover and Black-tailed Godwit are both listed as species upon which the SPA designation was made (the other two SPA species are Knot and Turnstone, neither of which were recorded in the five sub-sites surveyed). A further four species recorded are also listed as additional Special Conservation Interests in the SPA, namely Shelduck, Oystercatcher, Lapwing and Redshank.

**Table 4.2:** Maxima of birds by species recorded within each subsite, 2018.

able 4.2. Maximi	Survey-Sites								
Species	OVL01	OVL02	OZL02	OZL03	OZL05				
Mute Swan				2					
Brent Goose	108			46	40				
Shelduck	12	35	13	48	9				
Mallard	2	2	4	7	1				
Wigeon	39	14	63	40	21				
Teal	43	13	76	52	56				
Tufted Duck				2					
Cormorant	2			1	4				
Grey Heron					1				
Little Egret				2	1				
Little Grebe				1					
Oystercatcher	2	6		2					
Lapwing			89	48	17				
Golden Plover	2200			2	2600				
Curlew	6	45	4	9	38				
Black-tailed Godwit	69	270		199	407				
Bar-tailed Godwit		1			1				
Dunlin	115	28			200				
Greenshank	2	2	4	5	1				
Redshank	118	120	41	91	110				
Snipe			31						
Black-headed Gull			61	10	10				
Common Gull			5						
Lesser Black- backed Gull			9		2				
Herring Gull	6	7	47	1	70				
Great Black- backed Gull			1	2					

**Table 4.3** lists the percentage of the maxima count for the 6 no. recorded bird species of conservation interest within each selected sub site against the total baseline population of birds within the Boyne Estuary SPA.

The results indicate that Oystercatcher and Lapwing were only recorded in small numbers in any of the adjacent subsites to the Greenway, with a maximum of 0.6% of the baseline Boyne Estuary Oystercatcher population (in OVL02) and 1.9% of the Lapwing population (in OZL02). Up to one-fifth of the baseline Boyne Estuary SPA populations of Shelduck (22% in OZL03) and Redshank (20.6% in OVL02) were recorded, with higher proportions of Black-tailed Godwit (up to 86.4% of the baseline population level in OZL05).

**Table 4.3:** Percentage of the maxima count for the six bird species listed as SCIs for the Boyne Estuary SPA recorded within each sub site, against the total baseline population of birds within the SPA.

Species		Sı	Baseline Boyne Estuary			
Species	OVL01	OVL02	OZL02	OZL03	OZL05	SPA Population
Shelduck	5.5%	16.1%	6.0%	22.0%	4.1%	218
Oystercatcher	0.2%	0.6%	-	0.2%	-	1090
Lapwing	-	-	1.9%	1.0%	0.4%	4657
Golden Plover	36.2%	-	-	0.0%	42.8%	6070
Black-tailed Godwit	14.6%	57.3%	-	42.3%	86.4%	471
Redshank	20.2%	20.6%	7.0%	15.6%	18.9%	583

The surveys at subsites adjacent to the proposed route corridor identified important concentrations of birds, particularly Black-tailed Godwit. Therefore, the baseline populations will be evaluated to determine any likely impacts of the proposed route on the birds likely to be present and the identification of appropriate mitigation measures if required.

#### 4.2.2.1.5 Other fauna

No records of other protected faunal species, or species identified as rare or sensitive were identified during the field surveys completed along the proposed route in April 2018.

## 4.2.3 Fisheries and Aquatic Biodiversity

During the site walkover survey along the proposed route corridor, a visual assessment was carried out along the Boyne estuary transitional water body (IE\_EA\_010\_0100) and at the Stagrennan\_10 river water body (IE\_EA\_07S320550), specifically at the Stagrennan stream (EPA Code: 07S32) crossed by the proposed route.

All waterbodies within the study area are transitional, tidally influenced and directly affected by downstream inputs from the Boyne estuary, as well as from saline influxes. The banks of the Boyne estuary are composed of mud flats and lower salt marsh. The Stagrennan stream meets the Boyne estuary directly adjacent to the proposed alignment and is tidal in nature, affected by fluctuations in the Boyne. At the crossing point, the Stagrennan stream was approximately 5 metres in width. The Stagrennan river water body is unassigned for the WFD monitoring network and, due to its tidal nature, was deemed unsuitable for biological sampling. Based on an evaluation of the flow and tidal character, in addition to the physical habitat present, the fish community utilising the tidal lower reaches are evaluated as being contingent and directly connected with the fish community of the Boyne estuary, immediately adjacent.

# 5 Stage One: Screening for Appropriate Assessment

# 5.1 Background to European sites

The Habitats Directive (92/43/EEC) (Together with the Birds Directive – 2009/147/EC) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all, the Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

With the introduction of the EU Habitats Directive and Birds Directive, which were transposed into Irish law as S.I. No. 94/1997 European Communities (Birds and Natural Habitats) Regulations 1997, the European Union formally recognised the significance of protecting rare and endangered species of flora and fauna and also, more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011 — European Communities (Birds and Natural Habitats) Regulations 2011. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European sites'.

## 5.1.1 Habitats Directive/Special Areas of Conservation

Articles 3-9 of the EU Habitats Directive (92/43/EEC) provide the EU legislative framework of the protecting rare and endangered species of flora, fauna and habitats. Annex I of the Directive lists habitat types whose conservation requires designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, that are in danger of disappearing within the EU territory, are also listed in Annex I. Annex II of the Directive lists animal and plant species whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection, such as Lesser horseshoe bat and Otter. Finally, Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, Common frog and Pine marten.

Species can be listed in more than one Annex, as in the case of Otter and Lesser horseshoe bat, which are listed on both Annex II and Annex IV.

# 5.1.2 Birds Directive/Special Protection Areas

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds Directive) has been substantially amended several times. In the interest of clarity and rationality, the Birds Directive was codified in 2009 and is now cited as Directive 2009/147/EC. The Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3).

A subset of bird species has be identified in the Directive and is listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction, vulnerability to specific changes in their habitat and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

## 5.2 Relevant European sites for the proposed Boyne Greenway

As mentioned in **Section 3.2.3**, a zone of influence of 15 km has been identified for evaluation of likely significant effects of this project on European Sites. From a review of the NPWS protected sites data<sup>10</sup>, there are six designated sites for nature conservation within a 15km radius of the proposed works area:

- Boyne Coast and Estuary SAC (001957)
- Boyne Estuary SPA (004080)
- River Boyne and River Blackwater SAC (002299)
- River Boyne and River Blackwater SPA (004232)
- Clogher Head SAC (001459)
- River Nanny Estuary and Shore SPA (004158)

The locations of these European Sites are illustrated in **Figure 5.1**, with the distances from the proposed development project provided in **Table 5.1**.

Table 5.1: Proximity of European Sites to the proposed development project.

European Site	Distance from the proposed development
River Boyne and River Blackwater SPA (site code: 004232)	3.90 km
Boyne Coast and Estuary SAC (side code: 001957)	0 km
Clogher Head SAC (site code: 001459)	7.45 km
Boyne Estuary SPA (site code: 004080)	0 km
River Nanny Estuary and Shore SPA (site code: 004158)	3.90 km
River Boyne and River Blackwater SAC (site code: 002299)	3.90 km

#### 5.2.1 Description of European Sites under consideration

The Qualifying Interests/Special Conservation Interests and locational context for each of the European Sites examined in this Report are provided in **Table 5.2**.

Table 5.2: Description of European Sites within a 15km radius of the proposed development.

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code *denotes a priority habitat	Locational Context of European Site (extracted from Site Synopsis)
River Boyne and River Blackwater SPA (site code: 004232; NPWS, 2020b)	[A229] Kingfisher (Alcedo atthis)	The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Co Cavan, Louth and Westmeath. It

<sup>&</sup>lt;sup>10</sup> Available at <a href="https://www.npws.ie/maps-and-data">https://www.npws.ie/maps-and-data</a>. Accessed in May 2020.

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European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code *denotes a priority habitat	Locational Context of European Site (extracted from Site Synopsis)
	denotes a priority flabitat	includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation.
Boyne Coast and Estuary SAC (site code: 001957; NPWS, 2012b)	[1130] Estuaries [1140] Tidal Mudflats and Sandflats [1210] Annual vegetation of drift lines [1310] Salicornia Mud [1330] Atlantic Salt Meadows [2110] Embryonic Shifting Dunes [2120] Marram Dunes (White Dunes) [2130] Fixed Dunes (Grey Dunes)*	Boyne Coast and Estuary SAC is a coastal site which includes most of the tidal sections of the River Boyne, intertidal sand- and mudflats, saltmarshes, marginal grassland, and the stretch of coast from Bettystown to Termonfeckin that includes the Mornington and Baltray sand dune systems.
Clogher Head SAC (site code: 001459; NPWS, 2017)	[1230] Vegetated Sea Cliffs [4030] Dry Heath	Clogher Head is a promontory of Silurian quartzite, located approximately 10 km north-east of Drogheda in Co. Louth. The rocks are covered with a thin layer of soil that, in places, supports a coastal heath community. Areas of sea cliff, bedrock shore and dry grassland also occur within the site.
Boyne Estuary SPA (site code: 004080; NPWS, 2013)	[A048] Shelduck ( <i>Tadorna tadorna</i> )  [A130] Oystercatcher ( <i>Haematopus ostralegus</i> )  [A140] Golden Plover ( <i>Pluvialis apricaria</i> )  [A141] Grey Plover (Pluvialis squatarola)  [A142] Lapwing ( <i>Vanellus vanellus</i> )  [A143] Knot ( <i>Calidris canutus</i> )  [A144] Sanderling ( <i>Calidris alba</i> )  [A156] Black-tailed Godwit ( <i>Limosa limosa</i> )	This moderately-sized coastal site is situated west of Drogheda on the border of Counties Louth and Meath. The site comprises most of the estuary of the Boyne River, a substantial river which drains a large catchment. Apart from one section which is over 1 km wide, its width is mostly less than 500 m. The river channel, which is navigable and dredged, is defined by training walls, these being breached in places. Intertidal flats occur along the sides of the channelled river. The sediments vary from fine muds in the sheltered areas to sandy muds or sands towards the river mouth. The linear stretches of intertidal flats to the north and south of the river mouth are mainly composed of sand.

European Site Name and Code	Qualifying Interest /Special Conservation Interest and Code *denotes a priority habitat	Locational Context of European Site (extracted from Site Synopsis)
	[A162] Redshank ( <i>Tringa totanus</i> )  [A169] Turnstone ( <i>Arenaria interpres</i> )  [A195] Little Tern ( <i>Sterna albifrons</i> )  [A999] Wetland and Waterbirds	
River Nanny Estuary and Shore SPA (site code: 004158; NPWS, 2012a)	[A130] Oystercatcher (Haematopus ostralegus) [A137] Ringed Plover (Charadrius hiaticula) [A140] Golden Plover (Pluvialis apricaria) [A143] Knot (Calidris canutus) [A144] Sanderling (Calidris alba) [A184] Herring Gull (Larus argentatus) [A999] Wetland and Waterbirds	The site comprises the estuary of the River Nanny and sections of the shoreline to the north and south of the estuary (c. 3 km in length), in Co. Meath. The estuarine channel, which extends inland for almost 2 km, is narrow and well sheltered. Sediments are muddy in character and edged by saltmarsh and freshwater marsh/wet grassland. The saltmarsh is best developed in the eastern portion of the estuarine channel, with species such as Sea Plantain ( <i>Plantago maritima</i> ), Sea Aster ( <i>Aster tripolium</i> ), Red Fescue ( <i>Festuca rubra</i> ) and Sea Purslane ( <i>Halimione portulacoides</i> ) occurring. Further up the estuary, the marsh habitats support species such as Bulrush ( <i>Typha latifolia</i> ) and Yellow Flag ( <i>Iris pseudacorus</i> ). The shoreline, which is approximately 500 m in width to the low tide mark, comprises beach and intertidal habitats. It is a well-exposed shore, with coarse sand sediments. The well-developed beaches, which are backed in places by clay cliffs, provide high tide roosts for the birds. The village of Laytown occurs in the northern side of the River Nanny estuary.
River Boyne and River Blackwater SAC (site code: 002299; NPWS, 2020a)	[7230] Alkaline Fens [91E0] Alluvial Forests*  [1099] River Lamprey (Lampetra fluviatilis)  [1106] Atlantic Salmon (Salmo salar)  [1355] Otter (Lutra lutra)	This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath, and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part, with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site, including Slane, Navan, Kells, Trim, Athboy and Ballivor.

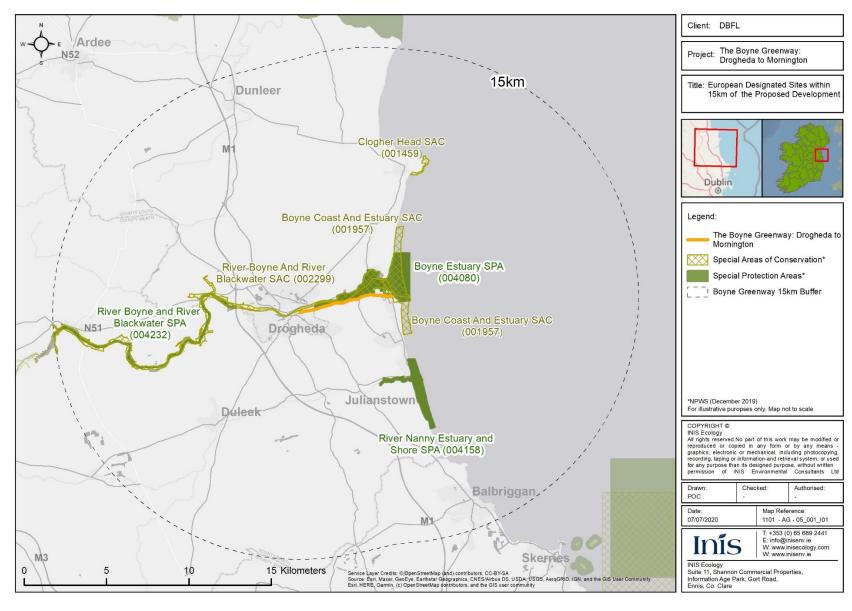


Figure 5.1: European Sites within 15km of the proposed development.

## 5.3 Assessment of Likely Significant Effects on European sites

The Appropriate Assessment evaluation of LSE is based on a conceptual model source-pathway-receptor, which identifies potential significant effects between a proposed development and European sites. The following Sections elaborate on the Sources and Pathways for the model of potential effects.

#### 5.3.1 Direct Habitat Loss, Fragmentation or Disturbance Effects

**Sources:** landcover change, movement of machinery; earthworks, excavations, use of fuels, chemicals, cement-based compounds; vegetation clearance, placement of bridges, piling.

Pathway: land cover, soils, water flow paths, air.

**Potential Effects:** These sources could remove, disturb or fragment habitats or species, reduce habitat connectivity within a SAC/SPA, or reduce aquatic habitat quality through sediment/contaminant/nutrient laden runoff.

## 5.3.2 Indirect terrestrial or aquatic habitat loss or degradation

**Sources:** Movement of machinery; earthworks, excavations; use of fuels, chemicals, cement-based compounds; excavation dewatering; vegetation clearance, placement of bridges.

Pathway: water runoff flow paths, watercourses, air.

**Potential Effects:** These sources could reduce water quality or habitat quality in hydrologically connected SAC/SPA European Sites through sediment/contaminant/nutrient laden runoff which could in-turn, cause indirect habitat loss or degradation effects to Qualifying Interests. Potential effects are ameliorated by limited magnitude of sources, duration of works and dilution capacity within estuarine environments subject to daily tidal inundation. The movement of materials may act as a vector for the spread of roadside invasive species (such as Japanese Knotweed) within the zone of works.

**Timing of Effects:** The potential for indirect effects mainly relates to the construction stage, when the vast majority of any excavations or use of machinery will take place. Once constructed, the Greenway project will require minimal maintenance.

# 5.3.2.1 <u>Indirect or Ex-Situ disturbance or displacement effects to Animal species of Qualifying</u> Interest

**Sources:** Construction works; movement of construction machinery and vehicles; presence of construction personnel; noise and vibration from construction works and construction machinery; in, or in close proximity to, estuarine environment.

Pathway: land cover, contact, air, visibility

**Potential Impacts:** These sources could cause disturbance or displacement effects to species of Qualifying Interests, such as Otter in SAC European Sites or Special Conservation Interest species of birds for SPA's present.

**Timing of Impacts:** Effects are mainly associated with the construction stage of the Greenway, but may also occur (albeit infrequently) during the operational stage, and decommissioning stage, of the

project. However, operational effect magnitude is reduced with habituation and dependant on the species present may have no effect at all.

# 5.3.3 Source-Pathway-Receptor Model for the Boyne Greenway: Screening of relevant European sites

An initial screening is carried out in **Table 5.3** to determine which, if any, of the relevant European sites within the ZoI can be excluded from further consideration due to appraised unlikelihood of significant effects to their QIs or SCIs.

**Table 5.3:** Initial Screening of the Potential for Boyne Greenway: Drogheda to Mornington to cause any effect to the relevant SACs.

European Site	Separation Distance to Boyne Greenway	Connectivity – Yes/No	Evaluation of potential for Boyne Greenway: Drogheda to Mornington to cause any of the following effects to the 3 SAC Sites under consideration:  1. Direct Habitat Loss, Fragmentation or Disturbance,  2. Indirect terrestrial or aquatic habitat loss or degradation,  3. Indirect/Ex-Situ disturbance or displacement of animal species
Boyne Coast and Estuary SAC (site code: 001957)	0.04 km	Yes	<ol> <li>Yes, Screened in – There is potential for direct habitat loss, habitat degradation or disturbance effects due to the location of the Greenway overlapping the site boundary.</li> <li>Yes, Screened in – There is potential for indirect habitat loss, habitat degradation or disturbance effects due to the location of the Greenway overlapping the site boundary.</li> <li>No Screened out – There is no potential for indirect or ex-situ disturbance or displacement effects as the site does not include animal species as qualifying interest.</li> </ol>
Clogher Head SAC (site code: 001459)	7.45 km	No	<ol> <li>No, Screened out - No potential for direct habitat loss, habitat degradation or disturbance effects due to separation distance.</li> <li>No, Screened out - No potential for indirect habitat degradation effects due to the absence of hydrological connectivity and the separation distance between construction works, or any operational stage work, and Clogher Head SAC.</li> <li>No, Screened out - No potential for indirect or ex-situ disturbance or displacement effects as Qualifying Interest only relate to habitats and plant species, and separation distance.</li> </ol>
River Boyne and River Blackwater SAC (site code: 002299)	0.04 km	Yes	<ol> <li>No, Screened out - No potential for direct habitat loss, habitat degradation or disturbance effects due to the location of the Greenway outside of this Site.</li> <li>Yes, Screened in – There is potential for indirect habitat loss, habitat degradation or disturbance effects due to the location of the Greenway in close proximity to the site boundary (ca. 30m at its closest).</li> <li>Yes, Screened in – There is potential for indirect or exsitu disturbance effects due to the location of the</li> </ol>

European Site	Separation Distance to Boyne Greenway	Connectivity – Yes/No	Evaluation of potential for Boyne Greenway: Drogheda to Mornington to cause any of the following effects to the 3 SAC Sites under consideration:  1. Direct Habitat Loss, Fragmentation or Disturbance,  2. Indirect terrestrial or aquatic habitat loss or degradation,  3. Indirect/Ex-Situ disturbance or displacement of animal species
			Greenway in close proximity to the site boundary (ca.30m at its closest).
River Boyne and River Blackwater SPA (site code: 004232)	3.90 km	No	1. No, Screened out - No potential for direct habitat loss, habitat degradation or disturbance effects — due to separation distance.  2. No, Screened out - No potential for indirect habitat degradation effects to Special Conservation Interests (Kingfisher) due to the upstream nature of hydrological connectivity and the separation distance between construction works, or any operational stage work, and the SPA.  3.No, Screened out - No potential for significant indirect or ex-situ disturbance or displacement effects to Special Conservation Interests (Kingfisher) due to separation distance, timing of construction works (outside the winter months when Kingfisher may move downstream to coastal areas), and availability of abundant displacement habitat. During Operation disturbance to potentially connected Kingfisher are evaluated as insignificant — Kingfisher show tolerance to human activity (MAD of 25m) and infrastructure during the winter months and the operational Greenway is adjacent to an existing source of disturbance/displacement in the form of a public road. No contrast to baseline conditions is expected.
Boyne Estuary SPA (site code: 004080)	0 km	Yes	<ol> <li>Yes, Screened in – There is potential for direct habitat loss, habitat degradation or disturbance effects due to the location of the Greenway overlapping the site boundary.</li> <li>Yes, Screened in – There is potential for indirect habitat loss, habitat degradation or disturbance effects due to the location of the Greenway overlapping the site boundary.</li> <li>Yes, Screened in – There is potential for indirect or ex-situ disturbance or displacement to birds due to the location of the Greenway overlapping the site boundary.</li> </ol>

European Site	Separation Distance to Boyne Greenway	Connectivity – Yes/No	Evaluation of potential for Boyne Greenway: Drogheda to Mornington to cause any of the following effects to the 3 SAC Sites under consideration:  1. Direct Habitat Loss, Fragmentation or Disturbance,  2. Indirect terrestrial or aquatic habitat loss or degradation,  3. Indirect/Ex-Situ disturbance or displacement of animal species
River Nanny	3.9km	No	1. No, Screened out - No potential for direct habitat
Estuary and			loss, habitat degradation or disturbance effects – due
Shore SPA			to separation distance.
(site code:			2. <b>No, Screened out</b> - No potential for indirect habitat
004158)			degradation effects due to separation distance.
			3. <b>No, Screened out</b> - No potential for significant
			indirect or ex-situ disturbance or displacement effects
			to Special Conservation Interests due to separation
			distance, timing of construction works (outside the
			winter months when any possibility of inter-movement
			of SCI Species between European sites may occur) and
			availability of abundant displacement habitat. During
			Operation disturbance to potentially inter- connected
			birds or species which may undertake movements between areas is evaluated as insignificant – the Nanny
			Shore (Site Synopsis) is primarily of importance for
			roosting birds which will be unaffected by operation of
			the Greenway.
			the Greenway.

## 5.4 Other Projects and Plans with Potential to Cause In-Combination Effects

A search of Meath and Louth County Council's online planning enquiry database<sup>11</sup> was undertaken to identify other projects and plans that are consented within the past five years that are proximal or within the proposed works area.

The following plans were identified:

- The Drogheda Southern Environs Plan (2009-2015);
- East Meath Local Area Plan (2014-2020);
- The Drogheda Development Plan (2005-2011);
- Variation No. 1: Drogheda Borough Council Development Plan (2011-2017.

In addition to a number of planning applications for minor alterations and or development of individual domestic housing, planning applications presented in **Table 5.4**, were identified within the study area, the cumulative assessment takes account of the potential development of these projects with regard to pathways for impacts and potential in combination or cumulative effects arising due to the proposed Boyne Greenway Project.

<sup>&</sup>lt;sup>11</sup> Available at <a href="http://www.eplanning.ie/MeathCC/searchtypes">http://www.eplanning.ie/MeathCC/searchtypes</a>. Accessed in May 2020.

Table 5.4: Planning applications within the local study area which may interact in combination or cumulatively with the Boyne Greenway Project.

File Number	Application Status	Decision Due Date	Decision Date	Decision Code	Received Date	Applicant Name	Development Address	Development Description	Local Authority Name	y
FS18136	Decision Made	16/01/2019	17/12/2018	Conditional	17/10/2018	Mornington New Homes,	Mornington Retail Centre, Corner of Buttergate Way and R150 Donacarney Little Mornington Co Meath	construction of a single storey retail block consisting of a retail unit and a coffee shop.	Meath Co.	Co.
LB180242	Application Finalised	13/09/2018	12/09/2018	Conditional	14/03/2018	Joe Connolly	Lands at Donacarney House (Protected Structure) Donacarney Little, Mornington County Meath	construction of 49 no. houses comprising 5 no. detached 2 storeys 4- bedroom houses.	Meath Co.	Co.
LB180389	Application Finalised	12/08/2018	09/08/2018	Conditional	23/04/2018	Rybo Partnership	Maydenhayes Road Donacarney Little	a 433m² single storey commercial building for retail and cafe	Meath Co.	Co.

File Number	Application Status	Decision Due Date	Decision Date	Decision Code	Received Date	Applicant Name	Development Address	Development Description	Local Authority Name
							Mornington, Co. Meath	use with 17 off-street car parking spaces	
LB180899	Incompleted Application				10/08/2018	Boyneside Camping Ltd.	Coast Road Mornington County Meath	change of use from golf driving range permitted under planning reference SA/40248 to Touring Campsite	Meath Co. Co.
LB18091	Appealed	17/10/2018	16/10/2018	Conditional	23/08/2018	Boyneside Camping Ltd.	Coast Road Mornington County Meath	change of use from golf driving range permitted under planning reference SA/40248 to Touring Campsite.	Meath Co. Co.

# 5.5 Stage One Screening Conclusion

The Stage One: Screening for Appropriate Assessment provided herein has examined potential effects via source pathway linkages on designated SACs and SPAs within 15km of the proposed development, either alone or in-combination.

There is a total of six relevant European sites located within the 15km zone of consideration:

- 1. River Boyne and River Blackwater SPA (site code: 004232);
- 2. Boyne Coast and Estuary SAC (site code: 001957);
- 3. Clogher Head SAC (site code: 001459);
- 4. Boyne Estuary SPA (site code: 004080);
- 5. River Nanny Estuary and Shore SPA (site code: 004158); and
- 6. River Boyne and River Blackwater SAC (site code: 002299).

Following screening, it can reasonably be concluded that **there** is <u>no</u> likelihood of significant effects to three of the above European sites as a result of the proposed development, either alone or incombination with other plans or projects, namely:

- Clogher Head SAC (site code: 001459);
- River Nanny Estuary and Shore SPA (site code: 004158); and
- River Boyne and River Blackwater SPA (site code: 004232).

Therefore, the above three European sites have been 'Screened Out' at Stage One of the Appropriate Assessment process.

Following the screening process, it has been determined that the potential for significant effects to European sites, other than the three listed above, cannot be excluded. By virtue of the requirement for protection or mitigation measures required during construction and operation of the proposed development, the recommendation of the screening process is, therefore, to proceed to Stage Two: Appropriate Assessment for the following three European sites:

- River Boyne and River Blackwater SAC (site code: 002299);
- Boyne Coast and Estuary SAC (site code: 001957); and
- Boyne Estuary SPA (site code: 004080).

# 6 Stage 2: Appropriate Assessment Report

Stage 2 Appropriate Assessment Report (Natura Impact Statement) examines the likely significant effects of the proposed development on the three relevant European sites identified within Stage 1 (see **Section 5**). This report will particularly appraise the significance of any potential effects on the Qualifying Interests and/or Special Conservation Interests and associated Conservation Objectives of the following European sites:

- River Boyne and River Blackwater SAC (site code: 002299);
- Boyne Coast and Estuary SAC (site code: 001957); and
- Boyne Estuary SPA (site code: 004080).

## 6.1 Iterative Design

A review for recommended measures likely to result in positive effects was also undertaken, for example Gill (2007), in a publication on approaches to measuring the effects of human disturbance on birds, suggests:

"Actively encouraging public education and responsible access to the countryside is a crucial element of local conservation efforts, and of developing the interests of current and future generations. In this context, restricting public access should only be considered when the conservation impact of human presence is demonstrably severe".

By way of a case study on the operational effects of Greenways on birds - possible disturbance impacts from a cycleway on shorebirds in a SPA has been studied for several years at Exe Estuary in Devon, England. In advance of this cycleway being opened, modelling simulations of increased levels of disturbance from the proposed cycle path along the side of the estuary were undertaken (Durell et al., 2007). The modelling in this study removed the areas of habitat where disturbance was likely to arise, therefore this simulation represents a "worst-case scenario" as it assumes that disturbance is continuous and constant throughout daylight hours, and that shorebirds never habituate to disturbance events. The Durell et al. (2007) study predicted that disturbance of upper mudflat areas was unlikely to affect shorebird survival.

Further studies on shorebirds and disturbance at the Exe Estuary arising from the cycle path also evaluated habituation once the cycle path was opened (Gross-Custard, 2008). This study determined that Redshank within 25m of the cycle path were largely habituated (i.e. no longer took flight) to disturbance arising from the use of the cycle path after 10 days and had completely habituated after 20 days.

Inis Environmental Consultants carried out a comprehensive gap analysis on available Biodiversity data for the route, covering the following:

- 1. Any previously commissioned baseline surveys and reporting on same;
- 2. The route iteration then proposed for development;
- 3. Results of consultation undertaken with Statutory Consultees, such as NPWS, in 2017.

Following this exercise and a comprehensive desktop review of available baseline data, a range of bespoke Biodiversity sensitive aspect-based surveys were commissioned in January 2018 to fully inform an iterative design process. Surveys focussed on habitat and mammal potential along the route corridor but importantly also the density and abundance of bird species present during the winter

months, and their respective levels of habitat usage for foraging, roosting etc within proximity to the route. Surveys also looked at existing levels of disturbance in order to gauge likely habituation levels, and to inform an evaluation of whether or not any Greenway development would result in a significant contrast to existing, baseline conditions. Evaluation included a peer reviewed literature relevant to assessing the effects of disturbance on birds, to ensure that all likely effects were evaluated to the point of complete, precise and definitive findings.

All field surveys were undertaken in line with Best Practice in ecological surveying, and following established methods in particular for Bird Surveys (such as the 2011/12 low tide program of surveys - although this was modified to provide a higher level of detail across the tidal cycle). Examination and Analysis of the extent of usage by wildfowl of the intertidal zones adjacent to the route corridor was carried out by an expert ornithologist and included evaluation of known sensitivities (in particular to noise and disturbance), the availability of suitable displacement habitat (see Inis, 2020) and provided insight into whether any effects were likely from the presence of a Greenway via either disturbance pathways or habitat related pathways would be positive or negative in terms of effect quality with possibility of resulting pathways to European Sites.

This process culminated in the derivation of an optimal route (both in terms of placement and construction) designed to avoid the potential for likely significant effects on European sites and Biodiversity receptors, in particular the Special Conservation Interests/Qualifying Interest of nearby European sites. A consultation process was undertaken with NPWS throughout 2018, culminating in the presentation of a route, with Biodiversity sensitive construction elements and methods.

In addition to the steps outlined above, research was undertaken to demonstrate precedent in terms of the development of Greenways, or projects of a similar size and nature, within or adjacent to European Sites (Natura Network) — in particular those designated for similar species and habitats as present along the River Boyne (notably, wading birds). A desktop review was undertaken to identify similar projects in proximity to European designated sites, both within the current jurisdiction but also within the wider European Context. Examples of these are provided in **Appendix C** of this report and a review is recommended.

#### 6.1.1 Research

**Table 6.1** presents a summary of similar projects (comprising Greenways, cycleways, national trails or a combination of all) which are located within European Sites similar to those present adjacent to the proposed development. A photo glossary of Greenways/Cycleways referenced is provided for reference as **Appendix C**.

Table 6.1: Selected European Sites where Greenways/Cycleways occur in close proximity.

Country	European Site	Degree of Overlap with existing Greenway/Cycleway/Walkway	
UK	The Exe Estuary SPA <sup>12</sup>	The Exe Estuary Trail is a cycle path and walkway, which is immediately adjacent to the Exe Estuary SPA for much of its route.	
Netherlands (Schierlonnikoog Island)	Waddenzee SPA	Within EU Site boundary	
Netherlands (Terschelling Island)	Waddenzee SPA & Duinin Terschelling SAC	Within EU Site boundary	
Portugal	Sintra/Cascais SAC	Within EU Site Boundary/Adjacent	
Belgium	Het Zwin SPA	Within EU Site Boundary/Adjacent	
Denmark	Harboore Tange SPA	Within EU Site boundary	
Netherlands (Rotterdam)	Haringvliet SPA	Within EU Site Boundary/Adjacent	
Italy	River Po Delta SPA	Within EU Site Boundary/Adjacent	
Netherlands (Lauwersmeer)	Lauwersmeer SPA	Within EU Site Boundary/Adjacent	

#### 6.1.2 Consultation

A full chronology of consultation is provided in **Section 3.4** and minutes of the meeting held with NPWS in October 2018 are provided in full in **Appendix B** of this report.

## **6.2** Appropriate Assessment

## 6.2.1 Relevant European Sites

The potential for habitat loss, hydrological connectivity (via overland flow) and disturbance/displacement via spatial overlap or proximity does exist for the Blackwater River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC and Boyne Estuary SPA. The proposed development project is examined, in **Table 6.2**, **Table 6.3** and **Table 6.4** below, for potential to cause significant effects to these European sites.

<sup>12</sup> The Exe Estuary in internationally important for wintering birds and qualifies as a SPA for Avocet and Slavonian grebe, and also as it regularly supports an assemblage of at least 20,000 waterfowl. Dunlin, oystercatcher, lapwing, wigeon and dark-bellied brent goose are the most abundant species within this assemblage. Wintering bird numbers start building from August, peaking in December.

## 6.2.2 Likely Significant Effects

The Appropriate Assessment is based on a conceptual site model which identifies potential sourcepathways effects between the proposed development and each European site.

#### **6.2.2.1** Matters Included in the further Evaluation

#### 6.2.2.1.1 List of Matters Included

The following matters are <u>included</u> in the Appropriate Assessment:

- 1. <u>Construction of the Proposed Development (alone and in combination with planning applications identified in Table 5.4)</u>
- Operation of the Proposed Development (alone and in combination with planning applications identified in Table 5.4) in respect of Disturbance to Birds and Mammals (e.g. Otter)

#### 6.2.2.1.2 List of Matters Excluded

The following matters are <u>excluded</u> from further consideration in the Assessment:

1. <u>Operation of the Proposed Development (alone and in combination with planning</u> applications identified in **Table 5.4**) in respect of Disturbance to Fisheries

Disturbance to Fisheries during operation can reasonably be excluded due to the separation distance from the operational Greenway to the main channel of the river, the habituation of fisheries present to existing sources of disturbance such as regular shipping, and in the absence of any known sensitivities from species such as Atlantic Salmon and Lamprey within an estuarine environment.

2. In combination effects with Plans/Part 8 applications (during construction and/or operation)

The size and scale of the proposed Boyne Greenway development results in a restricted potential zone of influence during both the construction and operational (utilisation) phase of the proposed development. An evaluation of other plans and projects, whether operational, in construction, or progressing through planning, has been undertaken. The potential for impact pathways arising from these developments which could potentially interact, either in-combination or cumulatively with the Greenway project is a function of the potential overlap between the proposed project and other such plans and projects within the wider study area. A review of these plans and projects within the study area is presented below, evaluating potential pathways for interaction which may arise with the Greenway.

The Drogheda Borough Council Development Plan  $2011 - 2017^{13}$  is the most recently published development plan published by Meath Co. Co. for the southern portion of Drogheda Town, within the Co. Meath border. There are no current development plans available to inform an overview of the development of Drogheda Town.

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Available at <a href="https://www.louthcoco.ie/en/publications/development-plans/drogheda-development-plans/drogheda-development-plans/drogheda-borough\_council\_development\_plan\_2011-2017.html">https://www.louthcoco.ie/en/publications/development-plans/drogheda-dev

However, Meath Co. Co. have published the East Meath Local Area Plan (2014-2020)<sup>14</sup> which incorporates the areas of Mornington and Mornington East, within the current study area. This plan was subject to an Appropriate Assessment (AA) in accordance with Article 6(3) of the EU Habitats Directive, as well as a Strategic Environmental Assessment (SEA) in accordance with Article 5(4) of the EC SEA Directive. The Natura Impact Report to inform the AA process for the East Meath Local Area Plan concluded that, assuming the successful implementation of the Policies and Objectives set out in the Plan, there will be no likely significant effects on the European sites in the zone of influence of the Plan in isolation or in combination with other Plans and Projects acting in the same area.

On this basis, taking account of the measures in the Plan to avoid significant effects, there are no pathways for interactions which could potentially result in in-combination or cumulative effects arising from the proposed Boyne Greenway Project, either during construction or operation.

This conclusion takes account of the policies and objectives contained within the East Meath Local Area Plan for environmental protection. Furthermore, this evaluation recognises the scale and extent of the proposed development with cognisance of the nature of the Greenway amenity development, which aims to manage and control public access within sensitive habitat areas.

From a review of the published Part 8 Applications submitted by Meath County Council, there are no projects listed on the public file<sup>15</sup> which would have the potential to interact cumulatively or incombination with the current proposal, taking account of the geographic zone of influence, in addition to the temporal timing of the project, and any potential for likely significant effects, wither during construction or operation is thereby excluded.

The Drogheda Port Company is currently working on a Master Plan for the future of the Port that will run from 2020-2050; the Master Plan is currently in development phase and will be subject to public consultation and stakeholder submissions. Given the timeline of the process, in addition to necessary impact assessment, Appropriate Assessment and environmental protective measures that will be inbuilt in compliance with legislative requirements, it is considered that there are no pathways for this Master Plan to interact in combination or cumulatively with the proposed Boyne Greenway Project, either during construction or operation, and it is accordingly excluded from further evaluation.

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<sup>&</sup>lt;sup>14</sup> Available at <a href="https://www.meath.ie/system/files/upload/East%20Meath%20Local%20Area%20Plan%202014-2020%20-%20Vol%201%20Written%20Statement.pdf">https://www.meath.ie/system/files/upload/East%20Meath%20Local%20Area%20Plan%202014-2020%20-%20Vol%201%20Written%20Statement.pdf</a>. Accessed in May 2020.

<sup>&</sup>lt;sup>15</sup> Available at <a href="http://www.meath.ie/CountyCouncil/Planning/Part8s/">http://www.meath.ie/CountyCouncil/Planning/Part8s/</a>. Accessed in May 2020.

Table 6.2: Assessment for River Boyne and River Blackwater SAC.

River Boyne and River Blackwater SAC  Qualifying Interests (QI)  (* Priority Annex I habitat)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site
[7230] Alkaline Fens [91E0] Alluvial Forests* [1099] River Lamprey ( <i>Lampetra fluviatilis</i> ) [1106] Atlantic Salmon ( <i>Salmo salar</i> ) [1355] Otter ( <i>Lutra lutra</i> )	Construction/Operation	Landcover Change Movement of soils and machinery Earthworks and Excavations Use of Fuels, Chemical or cement- based compounds Vegetation Clearance/Tree Felling Placement of Bridges/Piling	Run off/overland flows Air	Secondary Habitat Loss or Degradation Disturbance

#### Effects of the proposed project (alone and in combination):

#### Alkaline Fens/Alluvial Forests

No direct landcover change of these habitats is likely as none were recorded in baseline studies. Known locations all occur upstream. Secondary cross factor effects via water quality degradation during construction are considered unlikely due to the scale of dilution factor present, and the downstream location of works. No in combination during construction effects are predicted similarly. No effects or pathways for likely significant effects during operation.

#### River Lamprey/Atlantic Salmon

The construction works to deliver the Greenway will require works within the intertidal habitats of the River Boyne estuary. The lower reaches of this watercourse are utilised by River lamprey, Sea lamprey and Atlantic salmon for holding and passage upstream to spawning grounds. Sea trout also occur through the estuary and into freshwater habitats. There are no potential impacts affecting fish passage, as works are limited to the upper tidal zone of the riparian margin along the southern bank of the river. Any potential impacts affecting fish and fisheries in the estuary are limited to indirect disturbance and water quality impacts, which will be temporary and spatially restricted to the immediate proximity of the construction and are considered unlikely to be significant. Of the projects considered for in combination effects, none apart from the proposal for a campsite at Mornington are considered to occur in sufficient proximity to result in in-combination effects. The proposed development of a campsite at Mornington has been subject to a NIS which predicted no adverse effects on Site Integrity. Buffers exist between this development and estuarine environment so no in combination effects are predicted either during construction and/or operation.

#### Otter

No Otter holts were recorded in close proximity (within 50m) of the Greenway. Limited evidence was recorded of actual presence and the receiving habitat adjacent to the public roadway is largely unsuitable with no permanent loss of breeding habitat predicted. Disturbance effects during construction of any significance are considered unlikely as construction works will be limited to daylight hours. During Operation, it is considered that animals are unlikely to be affected by disturbance, and the screening included in the design of the boardwalk section will avoid visual intrusion. Biodiversity sensitive lighting or no lighting is proposed within intertidal sections where Otter

Rive	er Boyne and River Blackwater SAC	Proposed Project Stage	Potential Source(s) of Impacts to	Possible	Potential Effect(s)
Qua	alifying Interests (QI)		the European Site	Impact Pathway(s) to	on the European Site
(* P	Priority Annex I habitat)			European Site	

are likely to occur, and usage is likely to be at peak during daylight hours. Otters have also been recorded foraging in close proximity to human disturbance (Kruuk, 2006). Significant effects, alone or in combination, are unlikely.

Appropriate Assessment findings: Significant Effects on the European Site can reasonably be excluded.

Table 6.3: Assessment for Boyne Coast and Estuary SAC.

Boyne Coast and Estuary SAC  Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site
[1130] Estuaries [1140] Tidal Mudflats and Sandflats [1210] Annual vegetation of drift lines [1310] Salicornia Mud [1330] Atlantic Salt Meadows [2110] Embryonic Shifting Dunes [2120] Marram Dunes (White Dunes) [2130] Fixed Dunes (Grey Dunes) *	Construction/Operation	Landcover Change Movement of soils and machinery Earthworks and Excavations Use of Fuels, Chemical or cement- based compounds Vegetation Clearance/Tree Felling Placement of Bridges/Piling Habitat Creation Works	Run off/overland flows	Direct Habitat Loss, Fragmentation or Disturbance Indirect Habitat Loss or degradation

#### Effects of the proposed project (alone and in combination):

<u>Annual vegetation of drift lines:</u> Can be excluded from any significant effects considered due to location, separation distance and dilution factor.

Estuaries: Tidal Mudflats and Sandflats: Salicornia Mud, Atlantic Salt Meadows:

Whilst the footprint of the Greenway does overlap these habitats, it has been designed to avoid Annex Quality Saltmarsh for which the site is designated. Significant effects on this habitat type through direct habitat loss can be excluded. Similarly, the habitats in which the Greenway will be located are not supporting habitats to the habitats cited, comprising mainly scrub, roadside verge and other terrestrial classifications. During construction, secondary effects are limited to potential habitat degradation from the use of fuels, earthworks and excavations in close proximity and activities such as the placement of bridges (piling done from roadside). Dilution factor and assimilation

Boyne Coast and Estuary SAC Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site

capacity will avoid sediment runoff effects, and also avoid significant effects from the use of fuels and/or cement-based compounds in close proximity. A suitably qualified ECoW will be on site at all times to supervise works. Without placing any reliance on this, it is still considered that significant effects are unlikely. Usage during operation of e.g. oils is considered insignificant in terms of bicycle usage or required maintenance.

Habitat degradation through the spread of invasive species is considered. Japanese Knotweed was only recorded at a single location within 5m of the study area and is currently under treatment. No *Spartina* or Buckthorn or Sea Buckthorn is present within the route footprint, and significant effects via transfer of these invasive species can be excluded.

In combination during construction effects are unlikely as none of the developments listed occur in sufficiently close proximity. The size and scale and nature of the proposed nearby campsite is unlikely to result in significant in combination effects, either during construction or operation. Intertidal sections of boardwalk will be raised above intertidal muds and the structure and function of habitats present will not be impaired through operation.

#### Embryonic Shifting Dunes: Marram Dunes (White Dunes): Fixed Dunes (Grey Dunes):

There will be no likely direct or indirect effects on these habitats as the Boyne Greenway eastern section terminates within urban environment in Mornington, at a safe distance from these sensitive habitats.

Appropriate Assessment Findings: Significant Effects on the European Site can reasonably be excluded.

Table 6.4: Assessment for Boyne Estuary SPA (004080).

Boyne Estuary SPA Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site
Shelduck ( <i>Tadorna tadorna</i> ) [A048] Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Grey Plover ( <i>Pluvialis squatarola</i> ) [A141] Lapwing (Vanellus vanellus) [A142] Knot ( <i>Calidris canutus</i> ) [A143] Sanderling ( <i>Calidris alba</i> ) [A144] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Redshank ( <i>Tringa totanus</i> ) [A162] Turnstone ( <i>Arenaria interpres</i> ) [A169] Little Tern ( <i>Sterna albifrons</i> ) [A195] Wetland and Waterbirds [A999]	Construction/Operation	Landcover Change / Movement of soils and machinery/ Earthworks and Excavations/ Use of Fuels, Chemical or cement- based compounds Vegetation Clearance/Tree Felling Placement of Bridges/Piling Habitat Creation Works	Run off/overland flows Air	Direct Habitat Loss, Fragmentation or Disturbance Indirect Habitat Loss or degradation Indirect of ex-situ Disturbance or Displacement effect on Birds

#### Effects of the proposed project (alone and in combination):

#### **Direct Habitat Loss, Fragmentation or Disturbance:**

The majority of the route corridor occurs above the supra-tidal zone, thus avoiding direct habitat loss. Where the boardwalk is located within the intertidal zone over mudflat, the boardwalk composition and height above ground will allow sufficient light penetration to maintain habitat structure and function. Its proximity to a public roadway and raised nature infers that any birds which may forage in proximity will be able to maintain levels of foraging underneath the boardwalk. Disturbance or effective habitat loss is dealt with separately.

#### **Indirect Habitat Loss or Degradation:**

As the timing for works is outside the winter period (October to March), this will avoid secondary habitat degradation which could be associated with heavy rainfall/runoff during the winter months. However, the dilution and assimilation factor of the estuarine environment in close proximity is the main determinant in evaluating no likelihood for significant effects. The daily inundation cycle will ensure any degradation is avoided from runoff of sediment, fuels or chemicals associated

Boyne Estuary SPA Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site

with construction and, in light of this, no in combination effects are predicted. Effects during operation are considered insignificant in terms of bicycle usage or required maintenance.

Habitat degradation through the spread of invasive species is considered. Japanese Knotweed was only recorded at a single location within 5m of the study area and is currently under treatment. No Spartina or Buckthorn or Sea Buckthorn is present within the route footprint, and significant effects via transfer of these invasive species can be excluded.

#### Indirect or ex-situ Disturbance or Displacement effect on Birds:

Of the species recorded during fieldwork, Golden Plover and Black-tailed Godwit are both listed as species upon which the SPA designation was made (the other two SPA species are Knot and Turnstone, neither of which were recorded in the five sub-sites surveyed in baseline surveys). Further four species recorded are also listed as additional Special Conservation Interests in the SPA, namely Shelduck, Oystercatcher, Lapwing and Redshank. The results of baseline surveys indicate (see **Appendix A** also) that Oystercatcher and Lapwing were only recorded in small numbers in any of the adjacent subsites to the Greenway, with a maximum of 0.6% of the baseline Boyne Estuary Oystercatcher population (in OVL02) and 1.9% of the Lapwing population in (in OZL02). Up to one-fifth of the baseline Boyne Estuary SPA populations of Shelduck (22% in OZL03) and Redshank (20.6% in OVL02) were recorded, with higher proportions of Black-tailed Godwit (up to 86.4% of the baseline population level in OZL05). The surveys at subsites adjacent to the proposed route corridor identified important concentrations of birds, particularly Black-tailed Godwit.

No disturbance during construction will occur as the timing for works is outside the winter period (October to March). This will also avoid secondary habitat degradation. However, the dilution and assimilation factor of the estuarine environment in close proximity is the main determinant in evaluating no likelihood for significant effects. Daily inundation cycle will ensure any degradation is avoided from runoff of sediment, fuels or chemicals associated with construction. Due to the timing of construction outside the winter period no in combination effects are predicted. Effects from invasive species dispersal have already been evaluated as insignificant.

The influence of any disturbance during operation (i.e. the distance at which disturbance effects disrupt bird behaviour or activities) will be based upon a number of influencing factors, including species, weather, tide conditions and the exact nature of the disturbance event. A literature review conducted to inform route design and the current evaluation indicated that there are studies where human recreational activities have disturbed wintering shorebirds (Liley et al., 2011). However, the critical factor in evaluating potential disturbance events on wintering shorebirds, particularly in relation to a site designated for their conservation (such as the Boyne Estuary SPA in this case) is to determine first the scale and extent of bird usage (if present) and then if disturbance sources have the potential for significant effects on the conservation status of priority species which occur.

Boyne Estuary SPA Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site

Gill et al. (2001) sought to evaluate the impacts of such disturbance on an individual species (Black- tailed Godwit) to determine if disturbance was having a population effect at a study site in the UK. The authors concluded that human disturbance adjacent to foraging areas did not influence habitat use or the distribution of birds in their study area, with more importance placed on the quality of foraging habitats.

To further determine if disturbance effects are likely, the literature review looked at the individual tolerances of bird species to disturbance. Flight Initiation Distances (FID) are considered to be one of the most effective metrics to determine disturbance effects upon birds (Stankowich & Blumstein, 2005). However, birds may respond to disturbance events by other, non-flight, behaviours such as increased vigilance (Fernández-Juricic et al., 2005). Minimum Approach Distances (MADs), which are a function of FIDs, are therefore a more widely used approach for establishing set-back distances (or buffers) to limit disturbance effects around areas where birds occur and are thus considered the best available scientific technique.

Livezey et al. (2016) reviewed a substantial number of studies between 2009 and 2015 where FIDs had been calculated for the species groups of interest which also occur in the Boyne Estuary SPA, including non-breeding Anseriformes (wildfowl, including Shelduck and Charadriiformes - waders, including Oystercatcher, Lapwing, Golden Plover, Black-tailed Godwit and Redshank). As it offers the most comprehensive and best scientific knowledge currently available, the MADs presented in Livezey et al. (2016) were considered an appropriate basis for use in the evaluation of effects with respect to the Boyne Estuary.

The MADs utilised were 71.0m for Anseriformes and 42.2m in Charadriiformes. As there may be site-specific effects in relation to these distances, a precautionary application was used in the analysis below, with extended MADs of 100m for Shelduck and 50m for waders- to ensure a robust approach.

Data recorded from dedicated bird surveys were used to determine bird usage within pre-defined subsites of the Boyne Estuary. Detailed evaluation and analysis of this data was undertaken, with particular focus on the bird SCIs for the Boyne Estuary SPA. All bird occurrences within this data were assigned a distance from the proposed greenway route, either inside or outside the extended MADs.

By considering the availability of habitat within each subsite that each species could utilise that is also outside the likely disturbance distance (i.e. over 100m from the proposed route for Shelduck or over 50m away for waders), and the proportion of the population that *could* use these habitats, it is possible to determine what the effect of disturbance (if any) could be on the population. Put simply, the consideration is not how many birds are being disturbed, but rather what the likely effects of the disturbance on the birds likely to be present will be.

The greatest risk (as oppose to likely significant effects) of disturbance is for Black-tailed Godwit at subsite OVL02, where there is the potential for 10.62% of the population in the SPA (measured against the baseline population of 471 birds) to be present in any given period of the winter months. Our risk model suggests that 17.62% of the SPA population may be exposed to disturbance pathways on the surveyed subsites. However, the maxima recorded for Black-tailed Godwit for the five subsites collectively was 945 birds (more than double the total baseline population for the SPA). This infers birds move between subsites on different count days and are effectively being counted on more than one day. When considering habitat availability, this data confirms beyond reasonable doubt that there are sufficient

	Boyne Estuary SPA Species of Conservation Interest (SCI)	Proposed Project Stage	Potential Source(s) of Impacts to the European Site	Possible Impact Pathway(s) to European Site	Potential Effect(s) on the European Site	
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undisturbed habitats available to (and being used by) Black-tailed Godwit that exceeds the number of birds recorded on the subsites during fieldwork. This is considered complete, precise and definitive.

Furthermore, Gill et al. (2001) determined that Black-tailed Godwit may not be affected at the population level at all at a site by disturbance if there is sufficient foraging areas available, which our data also confirms is the case in the Boyne Estuary (see also data in Inis, 2020). Thus, effects at a population level and likely significant effects overall can be reasonably excluded.

In relation to the other species recorded which are also SCI species, further studies on shorebirds and disturbance such as at the Exe Estuary arising from a cycle path also evaluated habituation once the cycle path was opened (Gross-Custard, 2008). This study determined that Redshank within 25m of the cycle path were largely habituated (i.e. no longer took flight) to disturbance arising from the use of the cycle path after 10 days and had completely habituated after 20 days. No significant effects are predicted on this species. For the remaining species, the density of occurrence within the zone of effect confirms no likelihood of significant effects. With regards to Biodiversity sensitive operational lighting within intertidal areas, should it be required for health and safety purposes, this is not considered to result in any likelihood of significant effects.

During operation, in combination disturbance is considered limited to the potential for additive/synergistic effects from the nearby proposed campsite at Mornington. We note that a suite of mitigation measures to avoid disturbance to birds during operation has been included in the NIS for this development with a resultant conclusion of no likelihood of adverse effects on site integrity. It is assumed that in the event the operation of this development overlaps the operation of the Boyne Greenway, that the mitigation specified will be adhered to. As the Boyne Greenway in proximity to the campsite effectively runs along the public road, then additive or synergistic in combination effects are unlikely.

Appropriate Assessment Findings: Significant Effects on the European Site can reasonably be excluded.

## 6.2.3 Integral Project Features and Mitigation

#### **6.2.3.1** Noise/Disturbance Prevention

To counteract disturbance from dogs, particularly, and avoid noise transfer to birds and other species which may occur, the boardwalk barrier will be screened to half height (~600 mm), with full height (~1200 mm) being an option in particularly sensitive locations (such as intertidal). The screening will be provided by fixing boardwalk running boards to the fence posts. In addition, signage outlining the accepted 'code of conduct' for dogs will be instated, in line with Best Practice for similar Greenway Projects. These project elements will avoid significant effects from off leash dogs which have been shown to be the single highest source of disturbance in similar scenarios (Liley et al., 2011).

#### 6.2.3.2 **Timing of Works**

The majority of construction work within and proximal to intertidal work sections will be restricted to outside the period of October — March at all sensitive sites where disturbance is an issue, i.e. within the intertidal habitats of the SAC/SPA or immediately adjacent. Therefore, all works will be undertaken between March and September at times when wintering birds (i.e. the SCIs of the Boyne Estuary SPA) are absent. The timing restriction will not apply to public road sections where disturbance is constant. Camouflage netting will be utilised on all roadside works outside the period March to September to minimise noise transfer, as a matter of course.

In order to reduce impact on breeding birds, the removal of hedgerows and trees, should this be required, will be outside of the bird breeding season, which runs from 1st of March to the 31st of August

In addition to the above, all works will be overseen by a suitably qualified ECoW with experience in similar projects, who shall have 'stop works' authority.

## 6.2.3.3 <u>Landcover Change</u>

There are approximately 2.5km of proposed Greenway within the intertidal zones. In these areas, the Greenway will be elevated onto a boardwalk structure to: a) avoid impact on potentially foraging birds through habitat loss as designed through consultation with the consultant ecologist and NPWS; and b) avoid any significant landcover change. The boardwalk will be constructed approximately 1.5 metres above the current highest astronomical tide level. The width of the boardwalk will be limited to 4 metres (maximum). Following a review of the options, and in consultation with the ecological consultant, it has been agreed that the elevated boardwalk be formed using propriety recycled plastic elements.

#### 6.2.3.4 **Ecological Clerk of Works**

Regular monitoring of the works will be provided by a suitably qualified ECoW with a 'Stop Works' authority. This coverage will be full time onsite for the first 4 months of the project and 2 days per week thereafter, until the project is complete. Post construction ecological monitoring will be carried out in order to assess any potential changes form baseline conditions, as established during the bird surveys and habitat surveys which informed this assessment. Bird surveys will be in line with

precedents set at other operational Greenways such as within the Exe Estuary. The efficacy of the proposed habitat restoration/creation measures within the protected areas will be evaluated by a suitably qualified ecologist and any potential improvements will be put forward for implementation. The representative will have knowledge of working on construction programmes within SAC and SPA areas where significant bird populations exist and habitat restoration/creation within protected areas.

#### 6.2.3.5 **Noise Screening**

The timing of the works and the measures intrinsic to the design as specified within the design proposal outlined above (**Section 2**), have been selected to minimise the potential for impacts. Camouflage netting will be utilised on all roadside works outside the period March to September to minimise noise transfer, as a matter of course.

Any piling will be undertaken using reduced noise equipment in accordance with Best Practice. Where the requirement for piling arise within intertidal areas, this will proceed under direct supervision from the onsite ECoW and piling will take place from the road, to minimise the scale and extent of works within the boundary of European sites.

#### 6.2.3.6 **Operational Usage Design**

Operational lighting, where necessary for security and safety, will be LED based (to avoid emission of UV light) and will be cowled away from estuarine habitats with no light spillage allowed, in line with best practice for bats and birds. Low energy LED luminaires incorporating a solar power source and motion detectors will be used throughout. Furthermore, to minimise the requirement for lighting all access features, such as bollards and gates, shall have reflector strips in line with best practice guidance. Bird sensitive lighting or no lighting will be provided where birds forage within 50 metres of the Greenway to avoid any disturbance, lighting will be subject to health and safety requirements (Liley et al., 2011). Bird sensitive lighting design will be required where the route passes over or is within 50 metres of mudflat habitat. Final lighting locations, if required, will be selected following consultation with the project Ecologist.

## 7 Conclusion

This Natura Impact Statement has been prepared to provide sufficient objective scientific information in support of the proposed development, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive, in view of existing case law. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed development of the proposed Boyne Greenway (Drogheda to Mornington) Project, alone and incombination with other developments.

Appropriate Assessment Stage One Screening of all European sites identified within a 15km radius of the proposed development evaluated that the potential for significant effects on the Qualifying Interests and/or Special Conservation Interests of the Boyne Coast and Estuary SAC, River Boyne and River Blackwater SAC and Boyne Estuary SPA could not be excluded. In particular, potential effects responsible for habitat loss and noise and disturbance on wintering birds and indirect effects via a deterioration in water quality. Thus, the above elements were brought forward for further critical examination in the Natura Impact Statement Report to inform the Appropriate Assessment process. The likely significant effects were identified.

Following examination and analysis and taking account of the protective measures proposed during the construction and operation phases, the potential for significant effects during construction and operation were found not to be significant.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines integrity as the 'coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed development will not give rise to significant effects on the integrity of any of the identified European sites evaluated herein.

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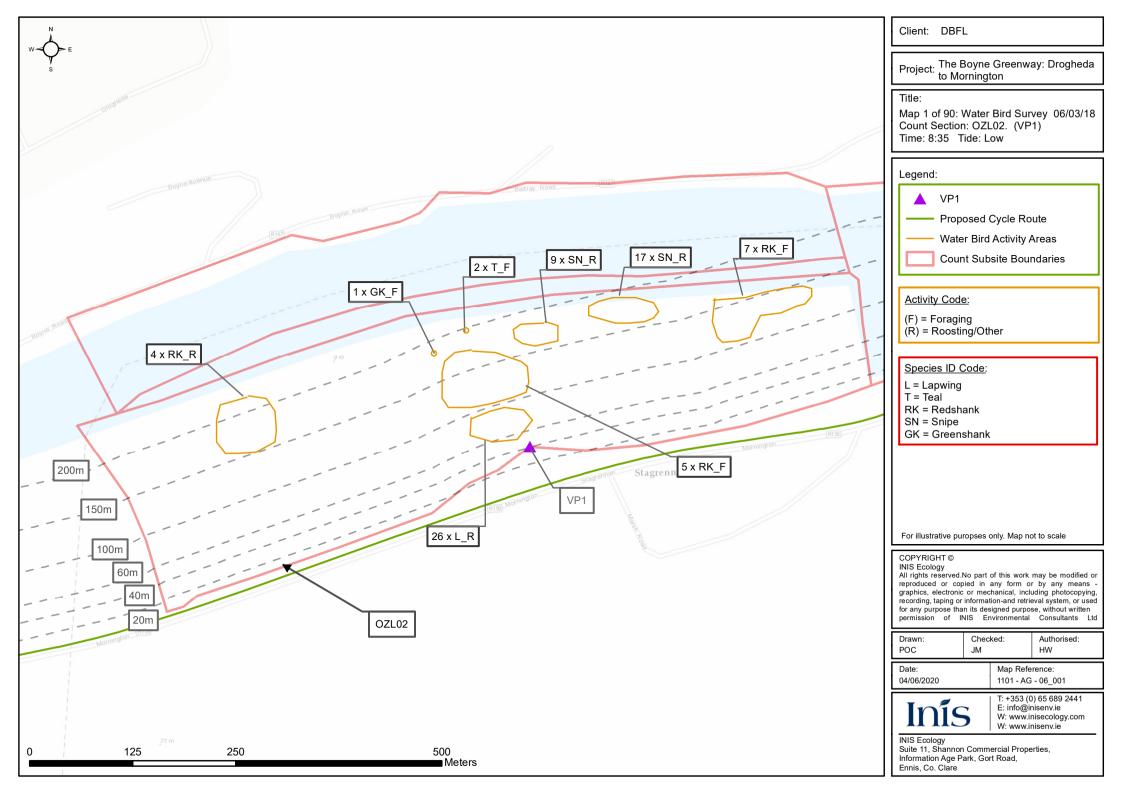
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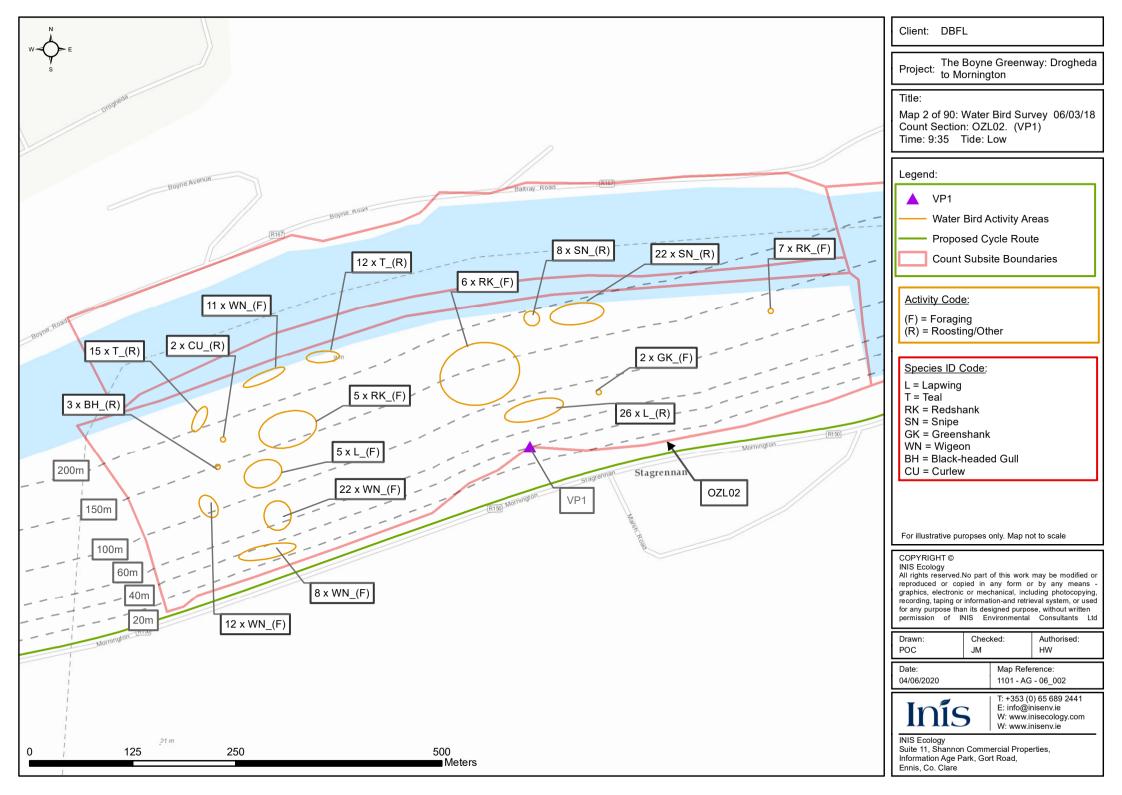
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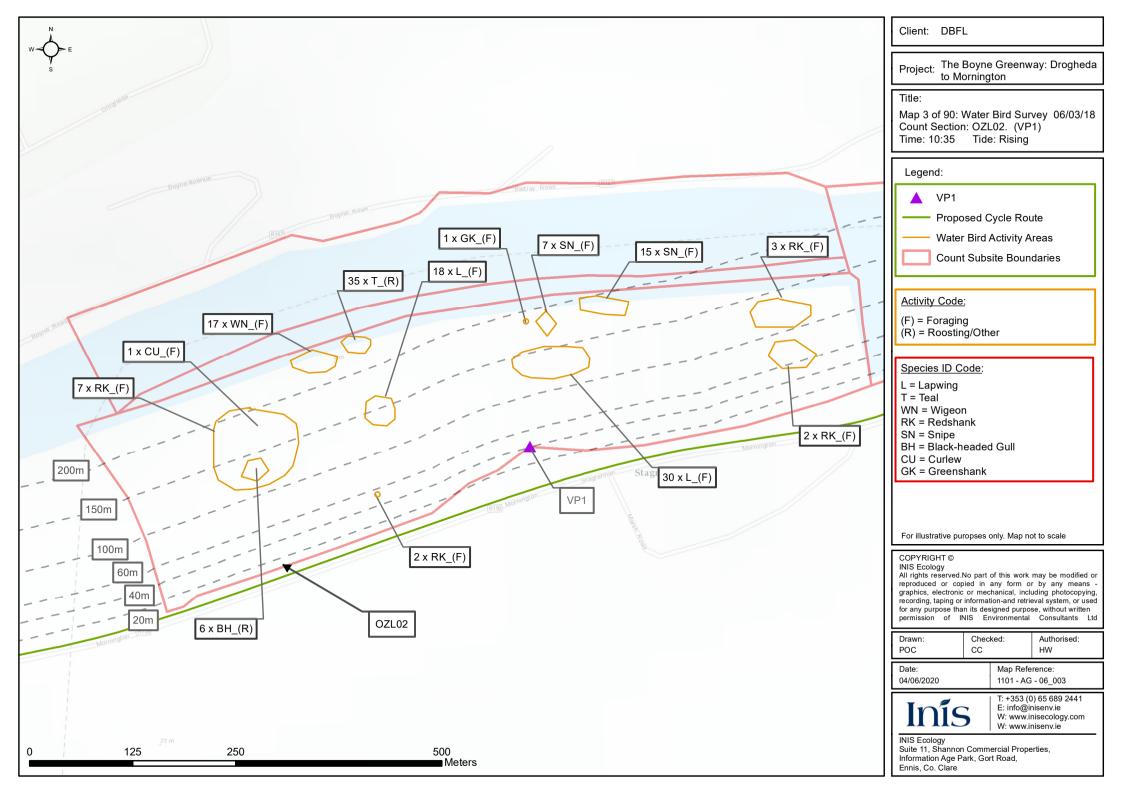
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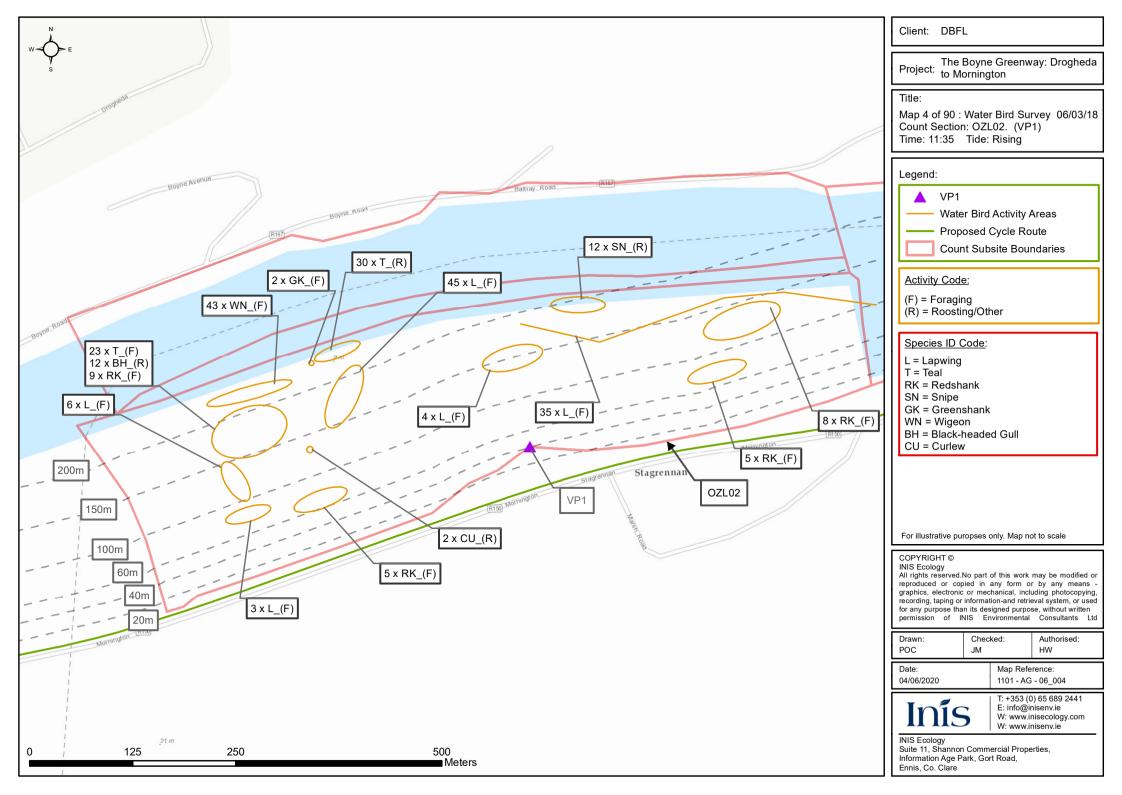
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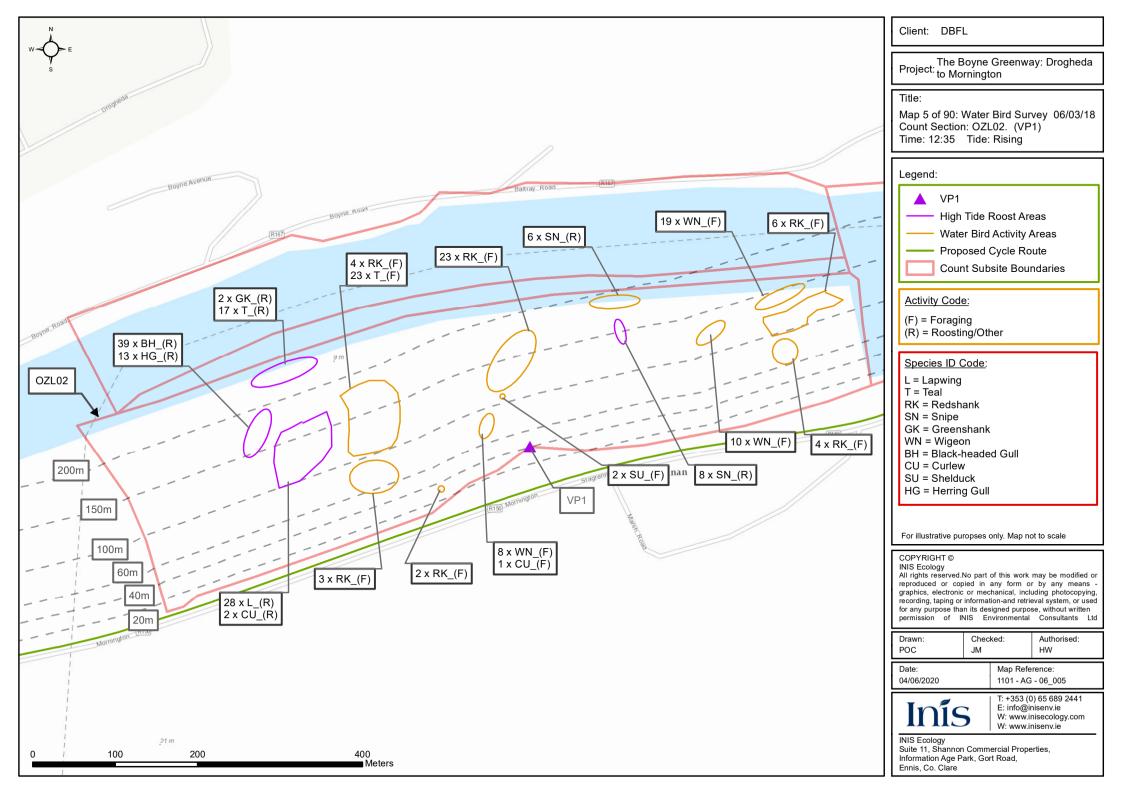
## **Appendix A: Supporting Figures**

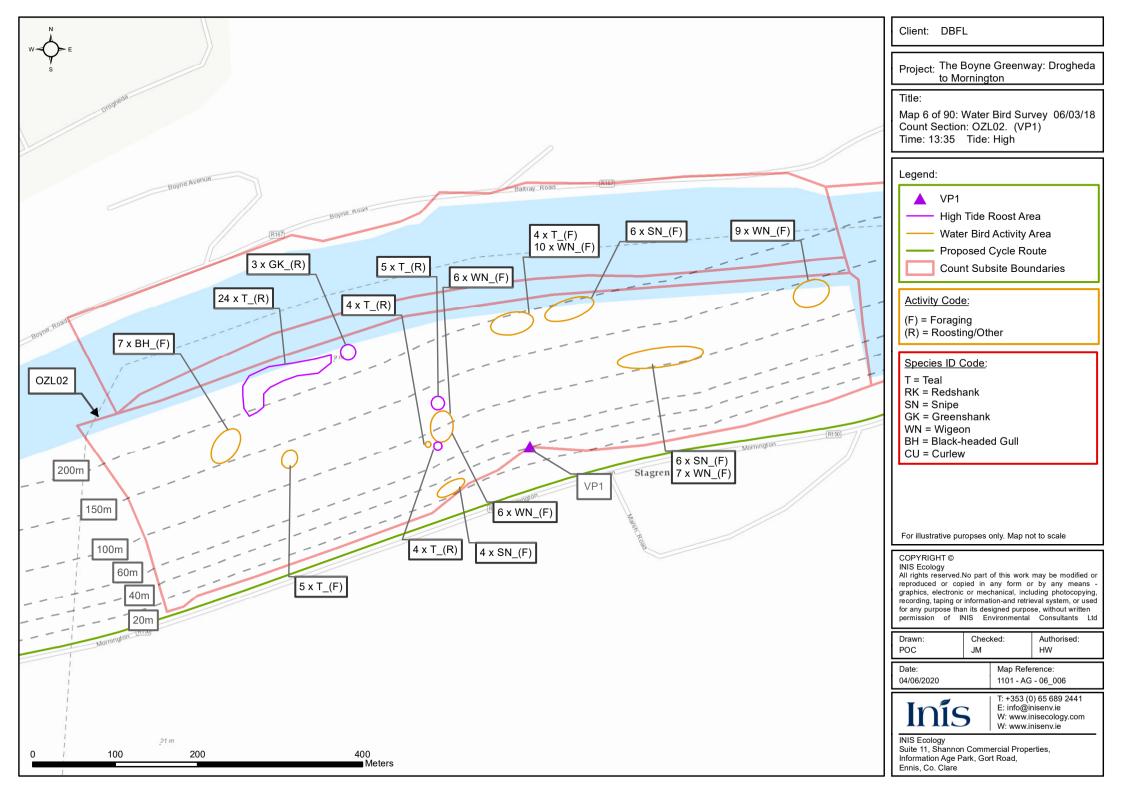


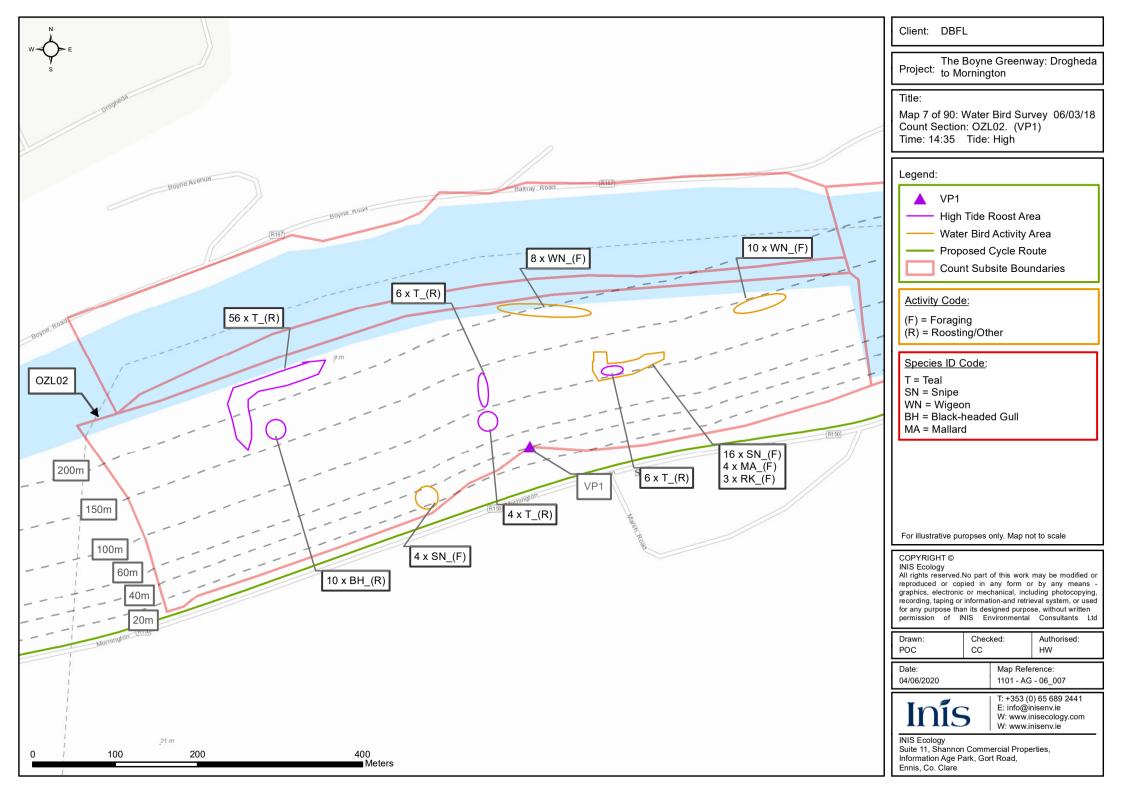


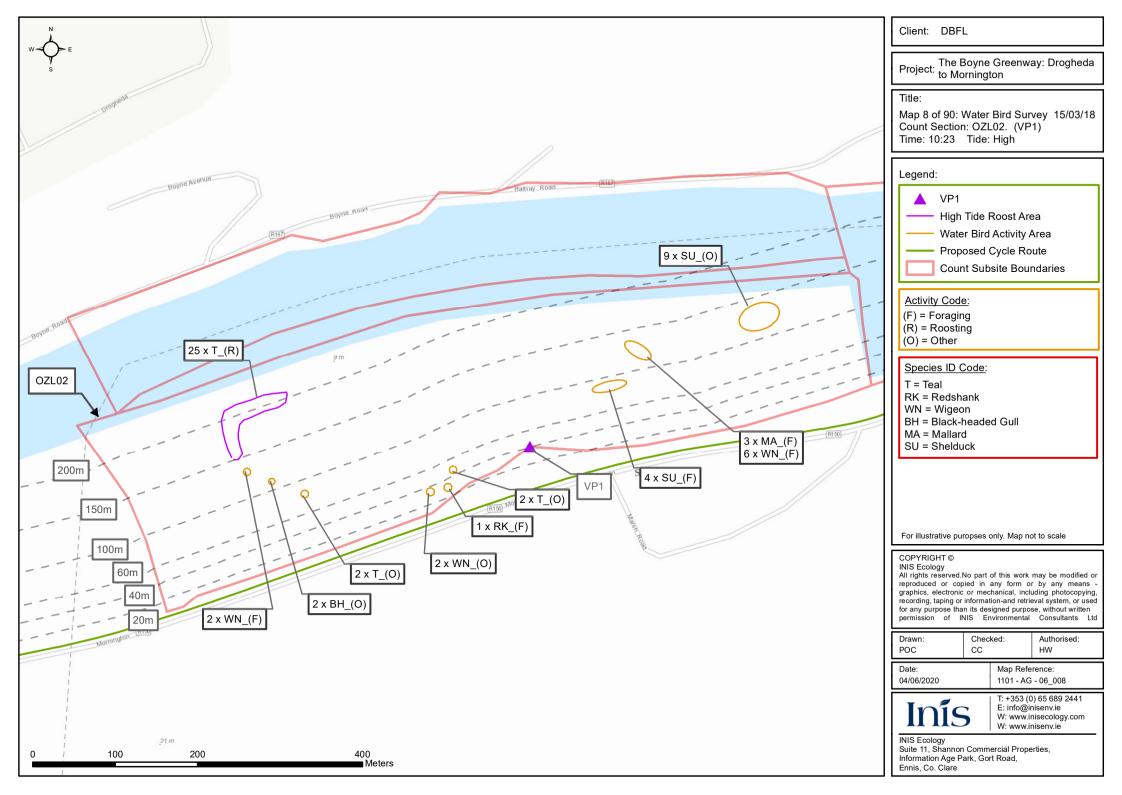


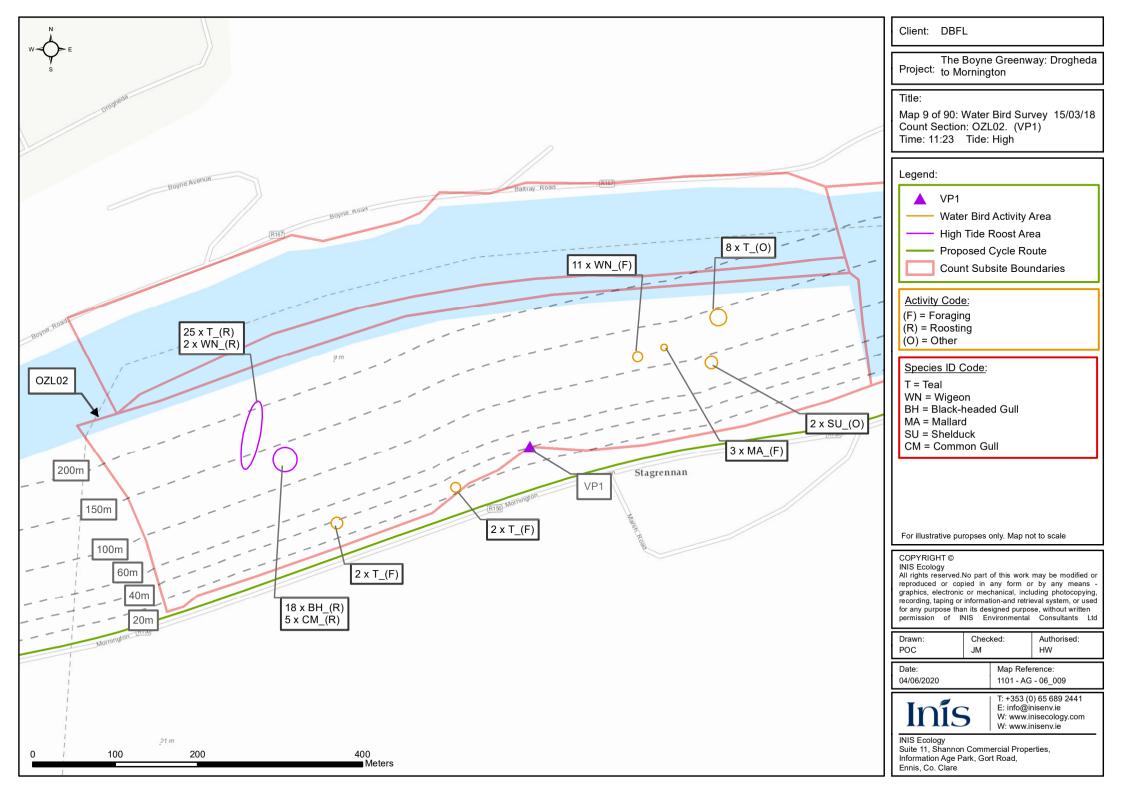


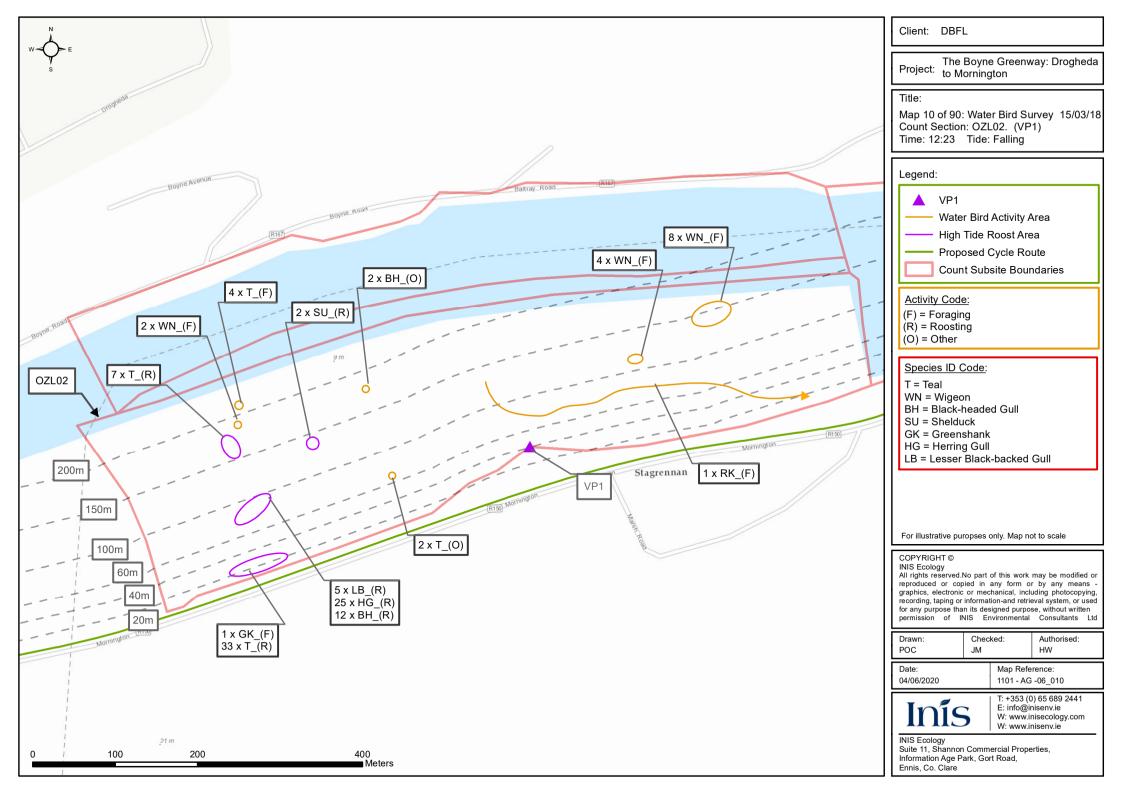


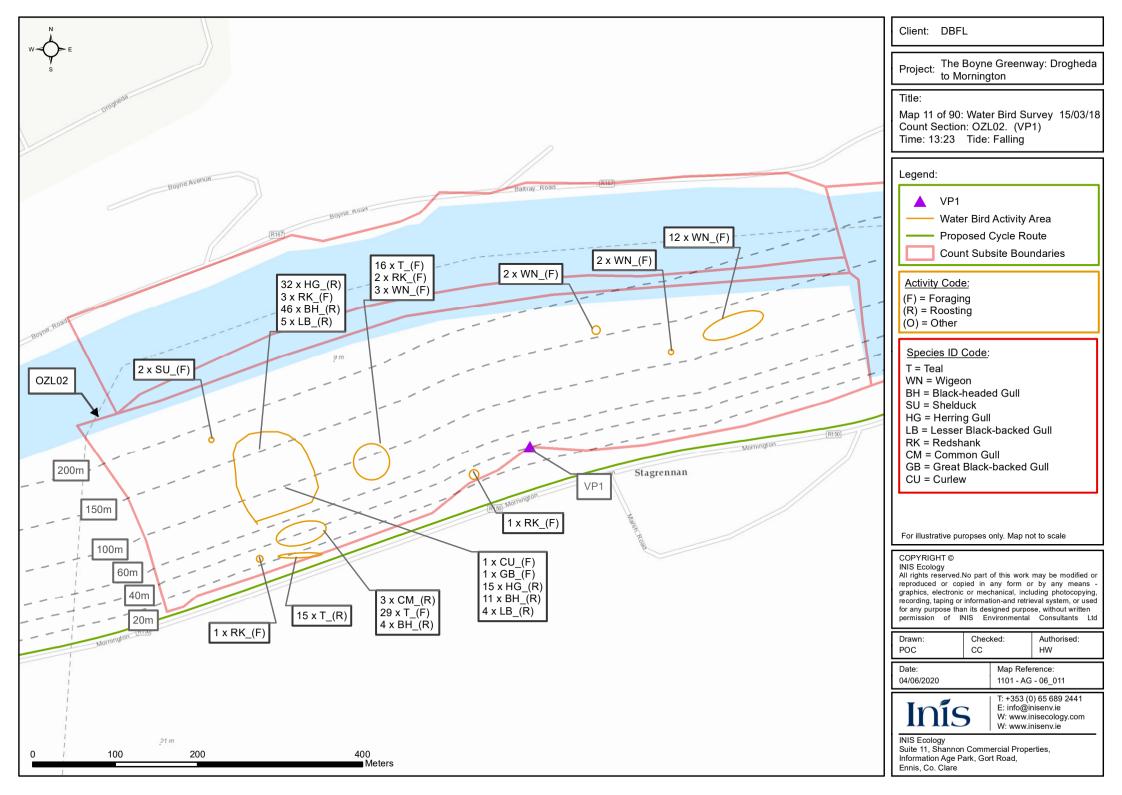


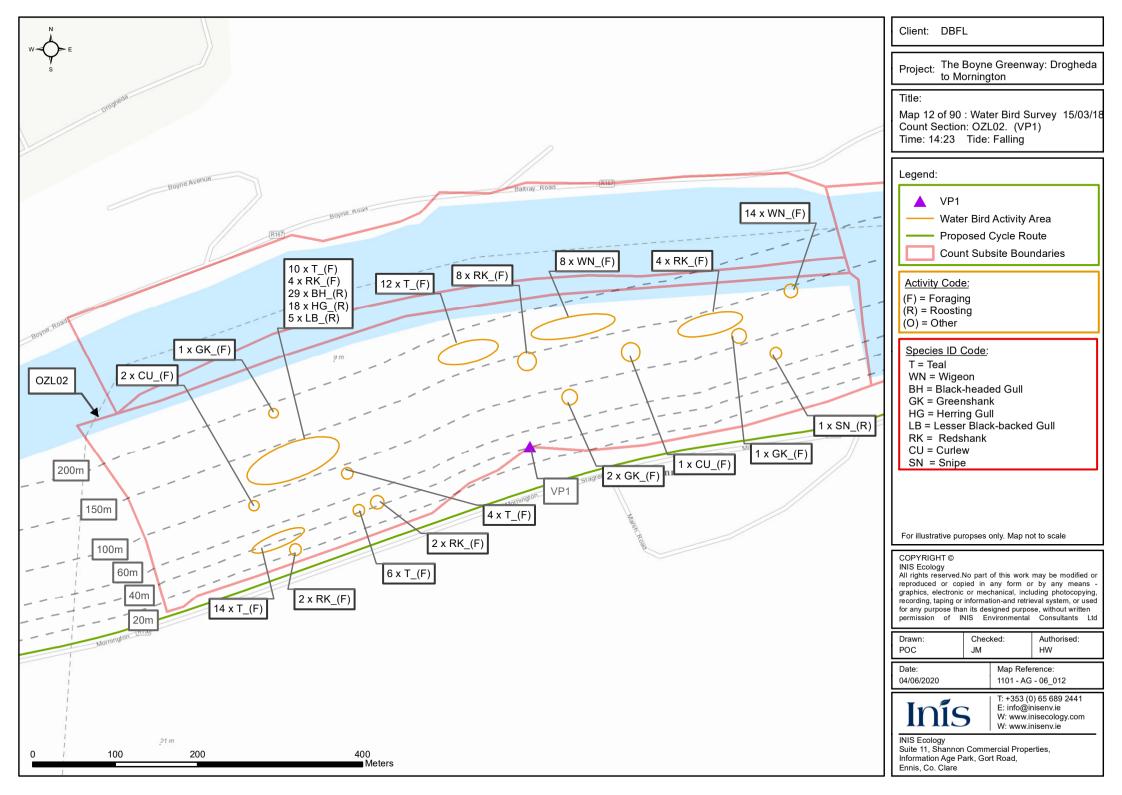


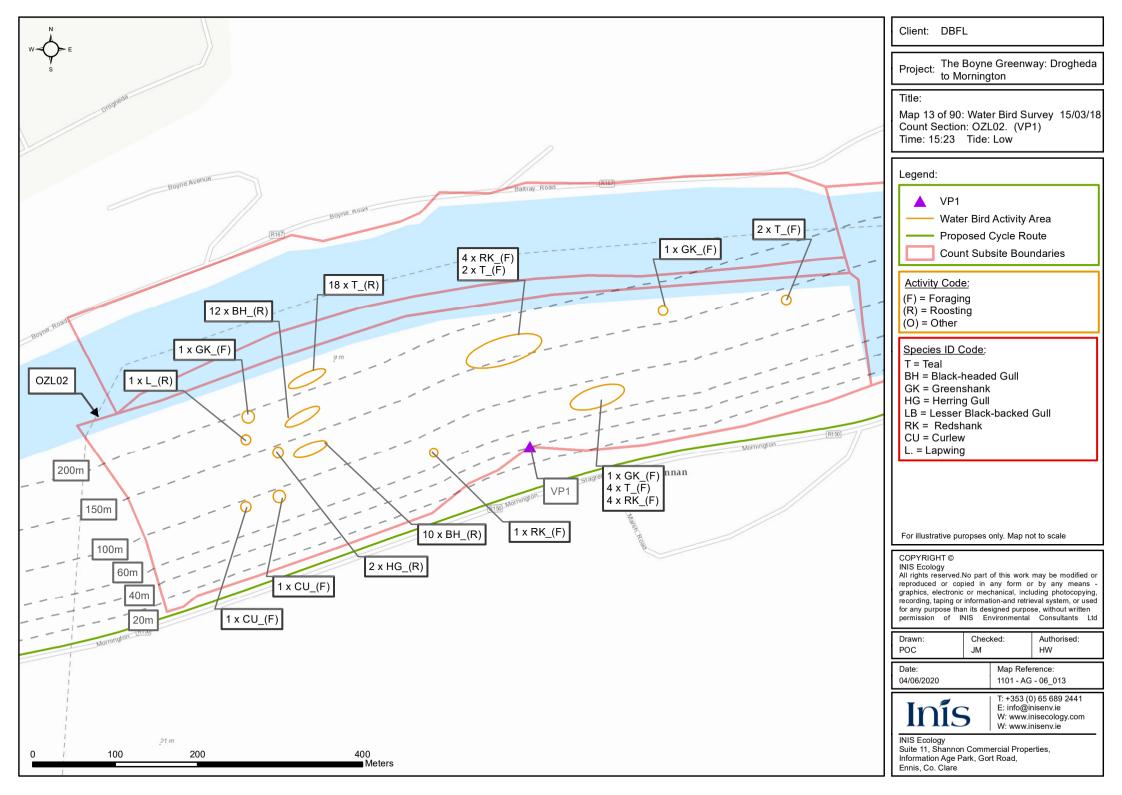


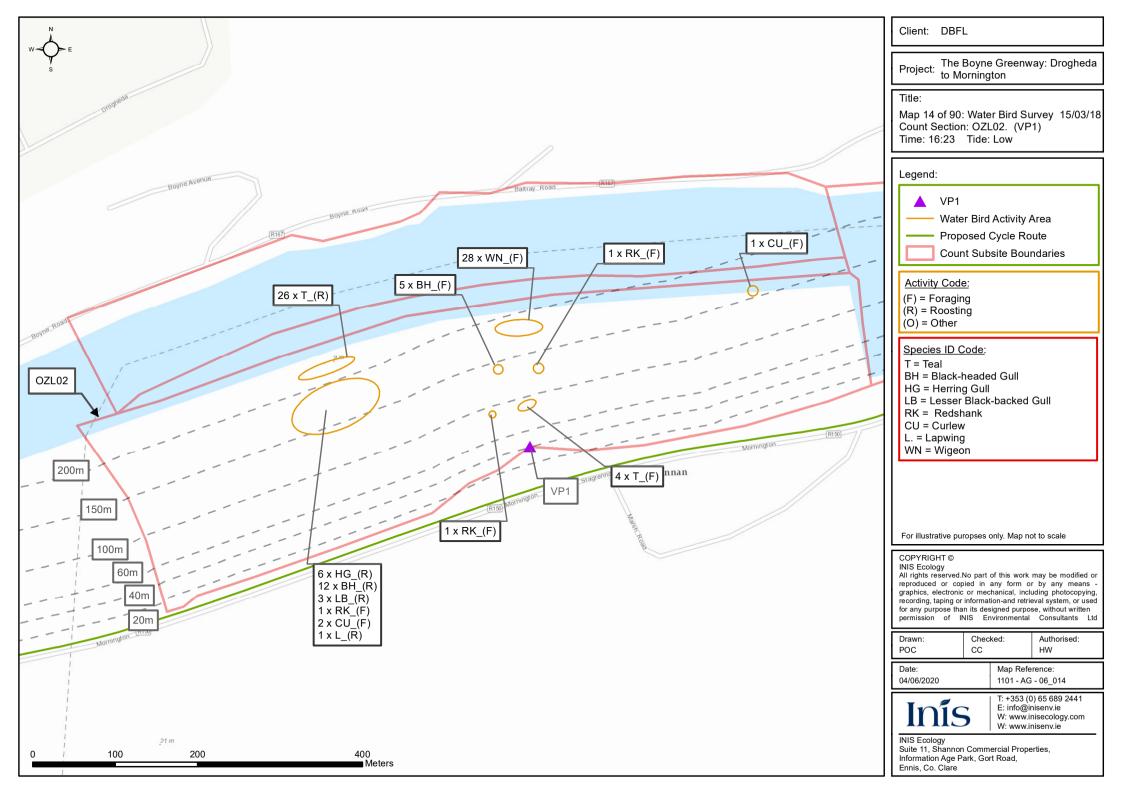


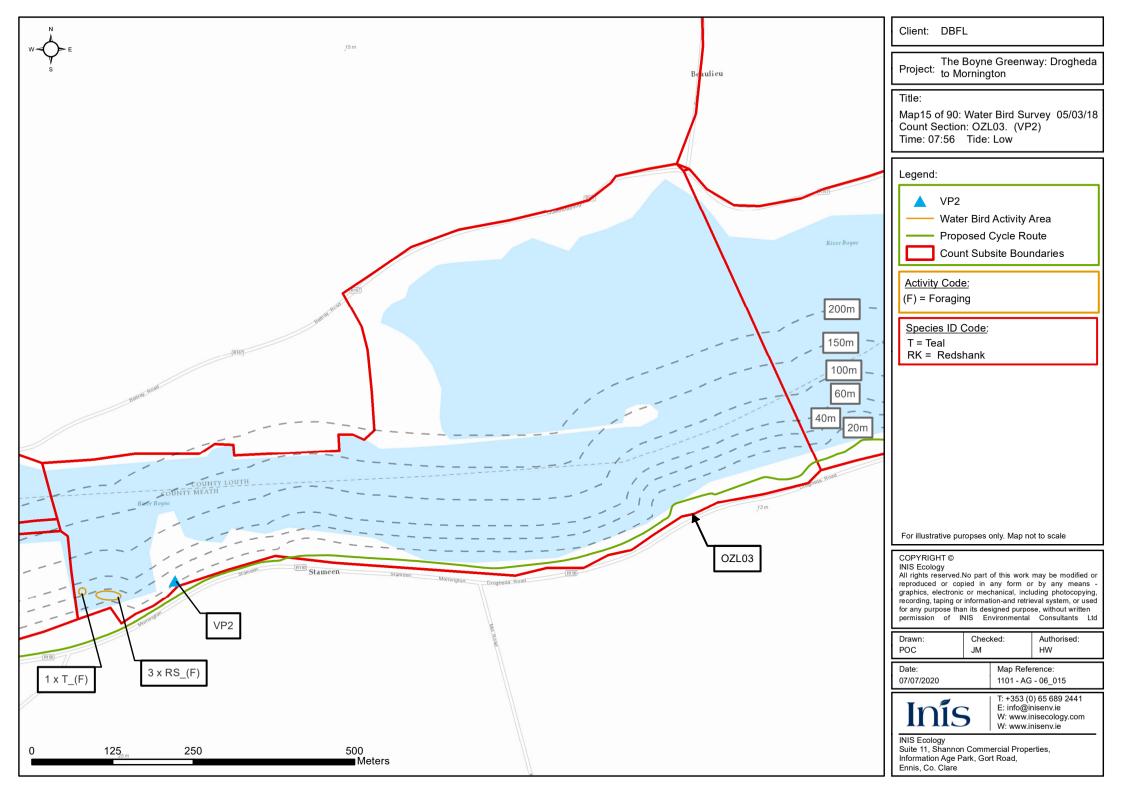


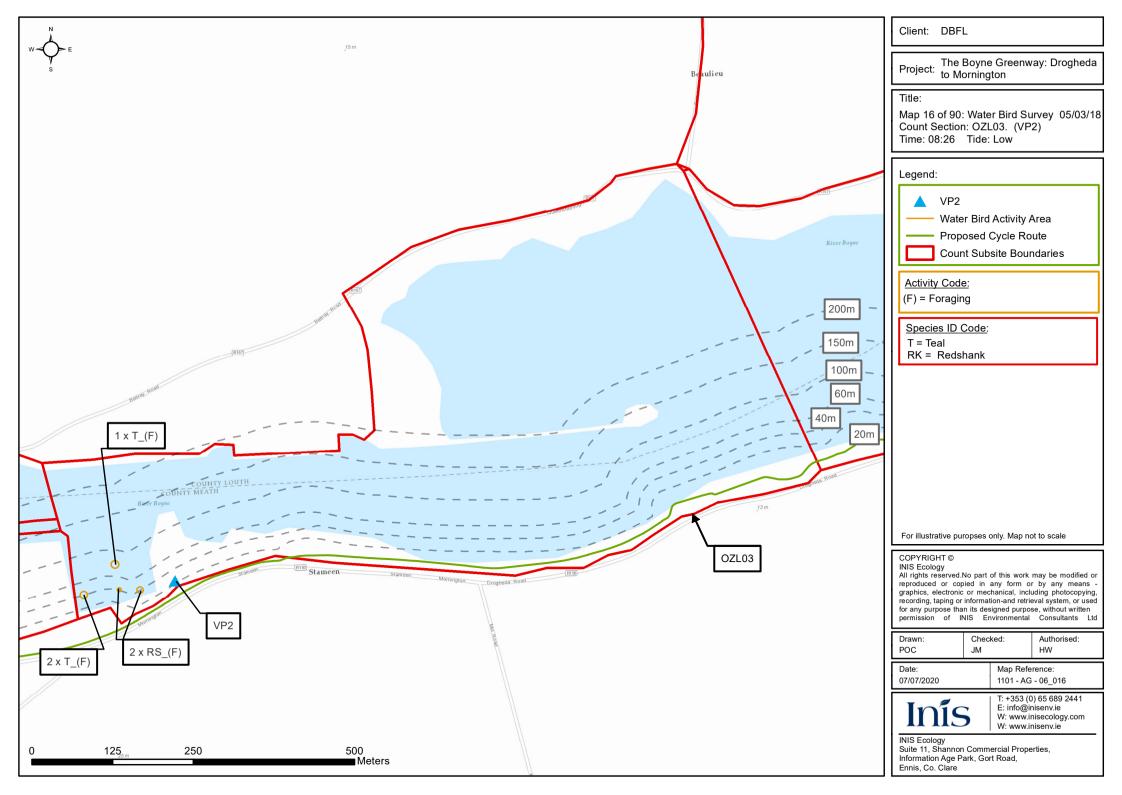


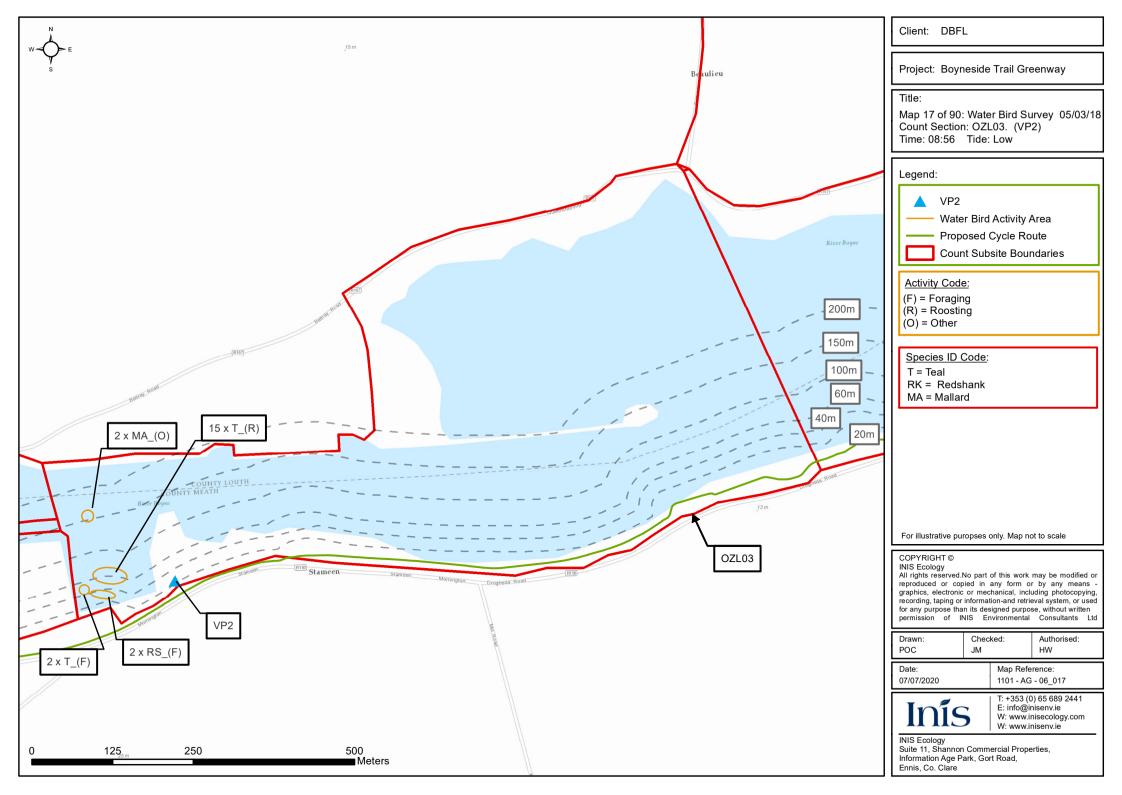


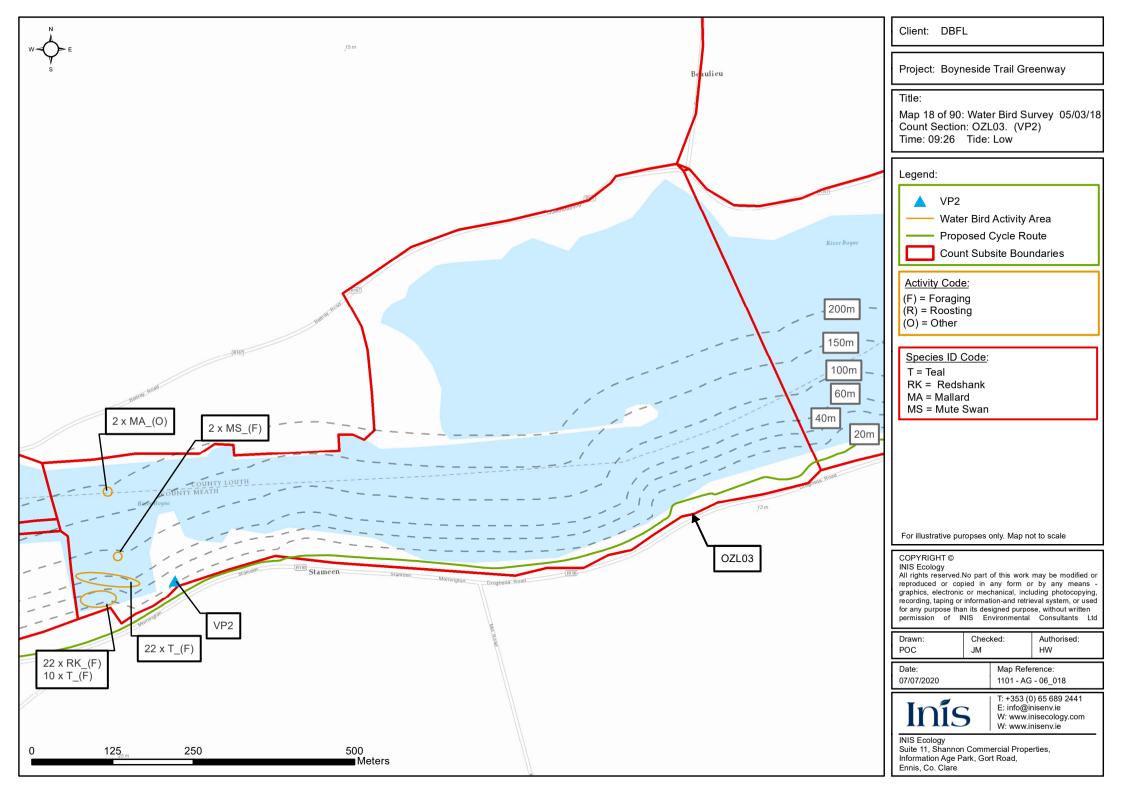


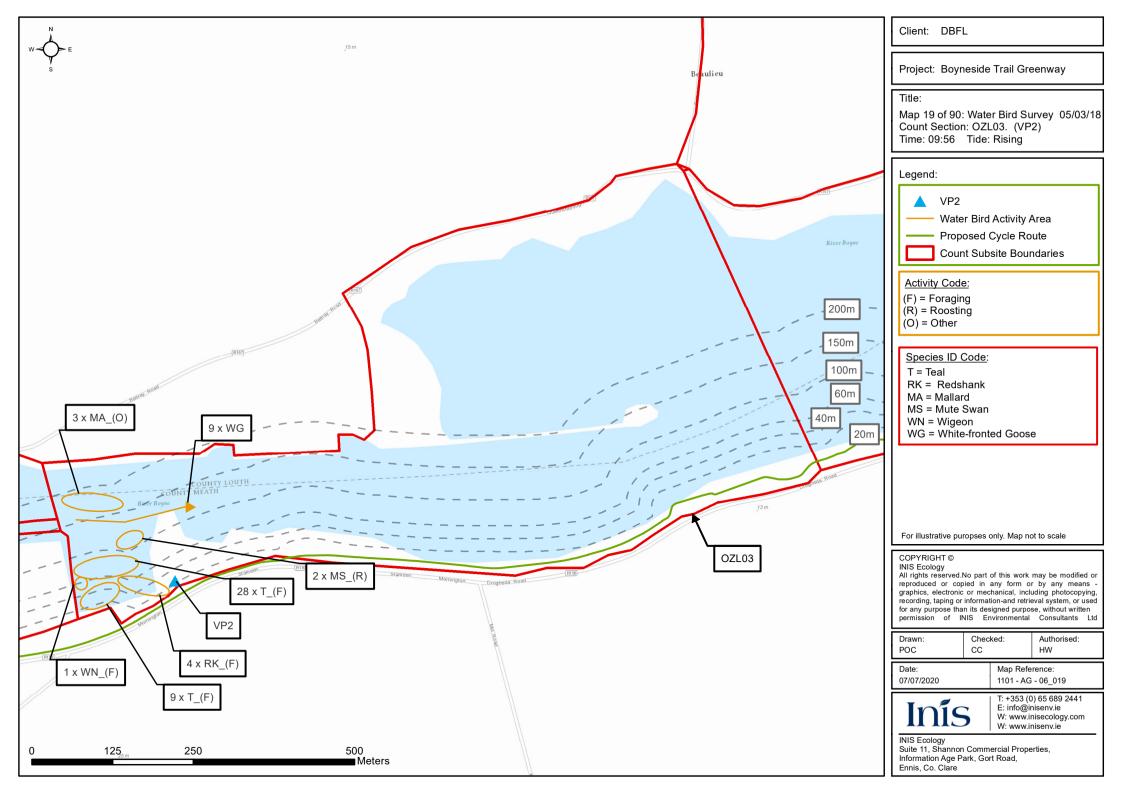


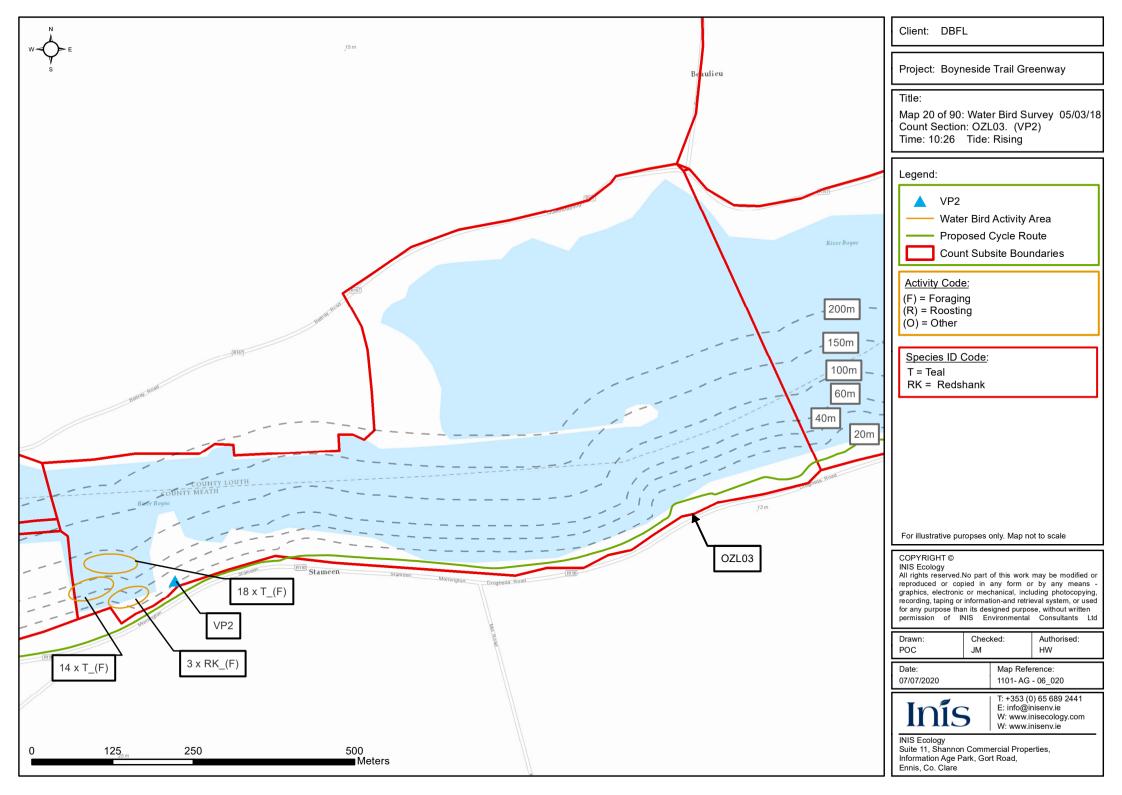


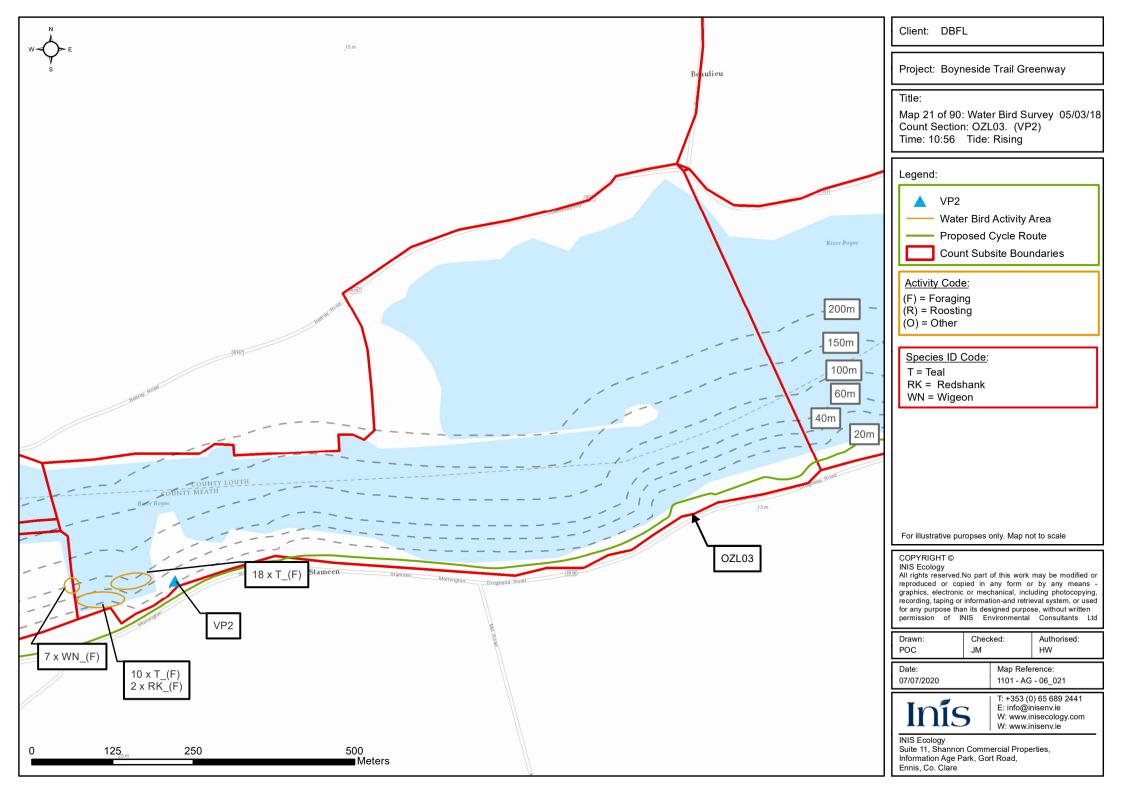


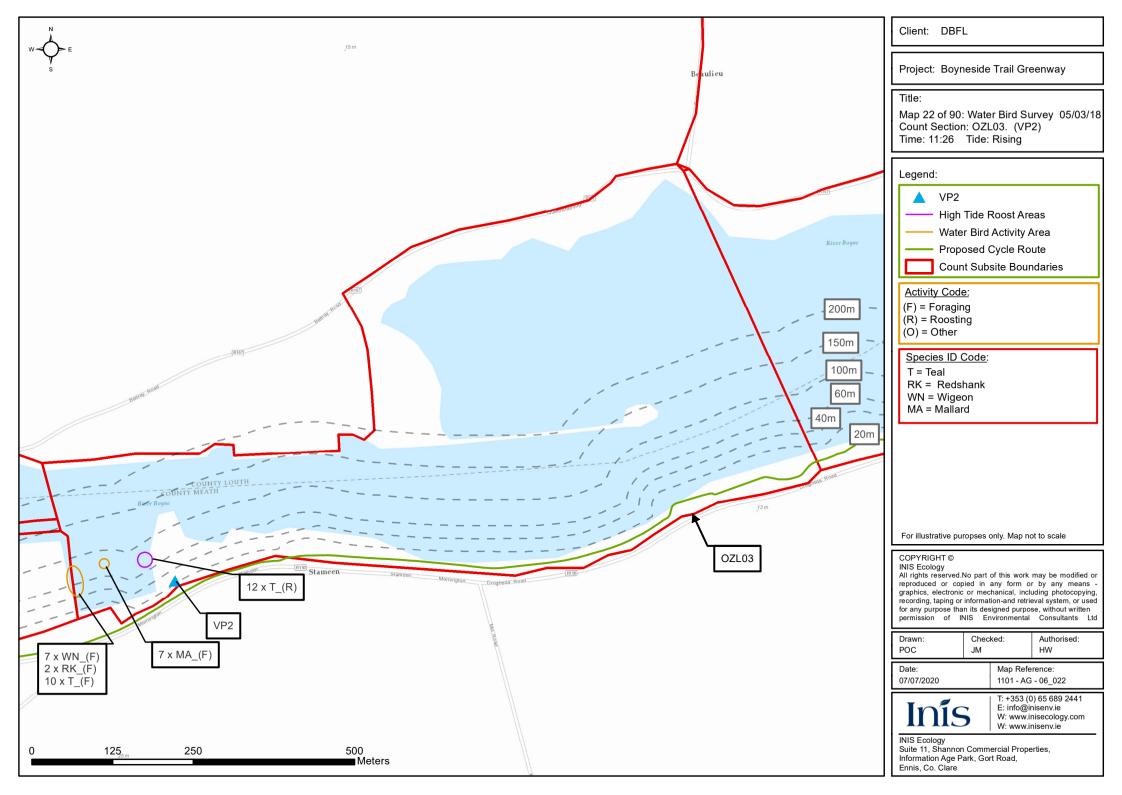


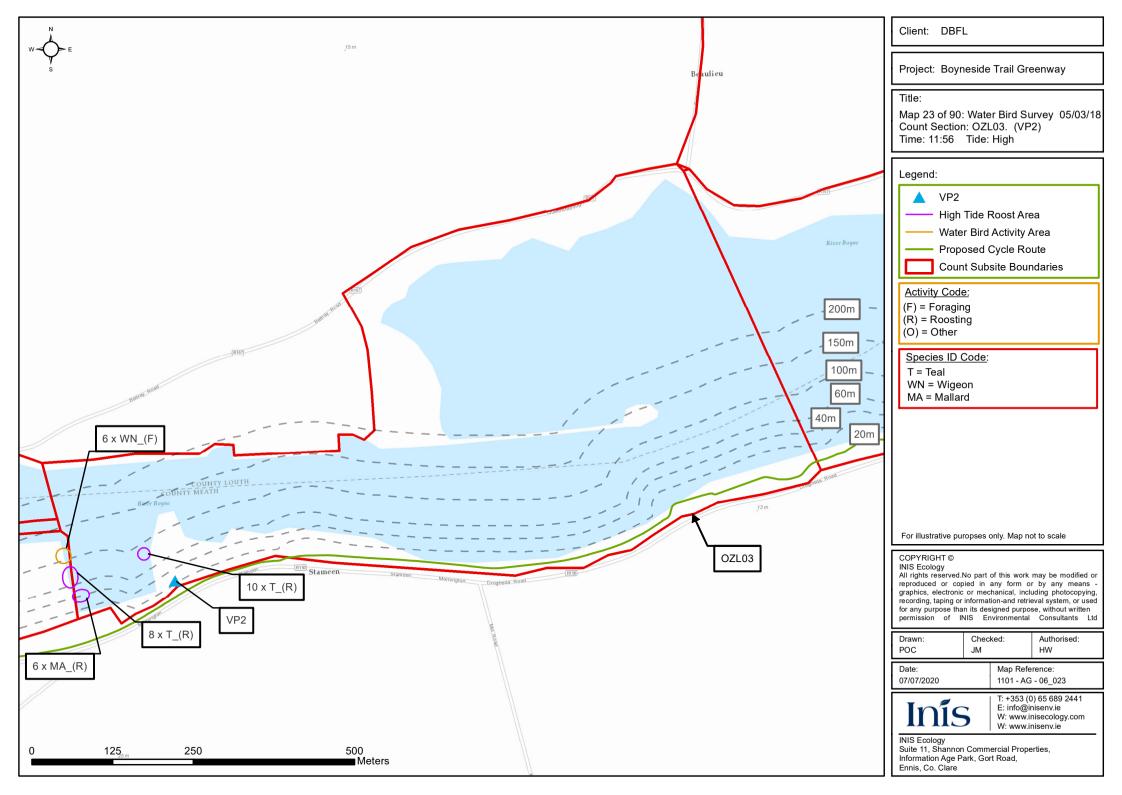


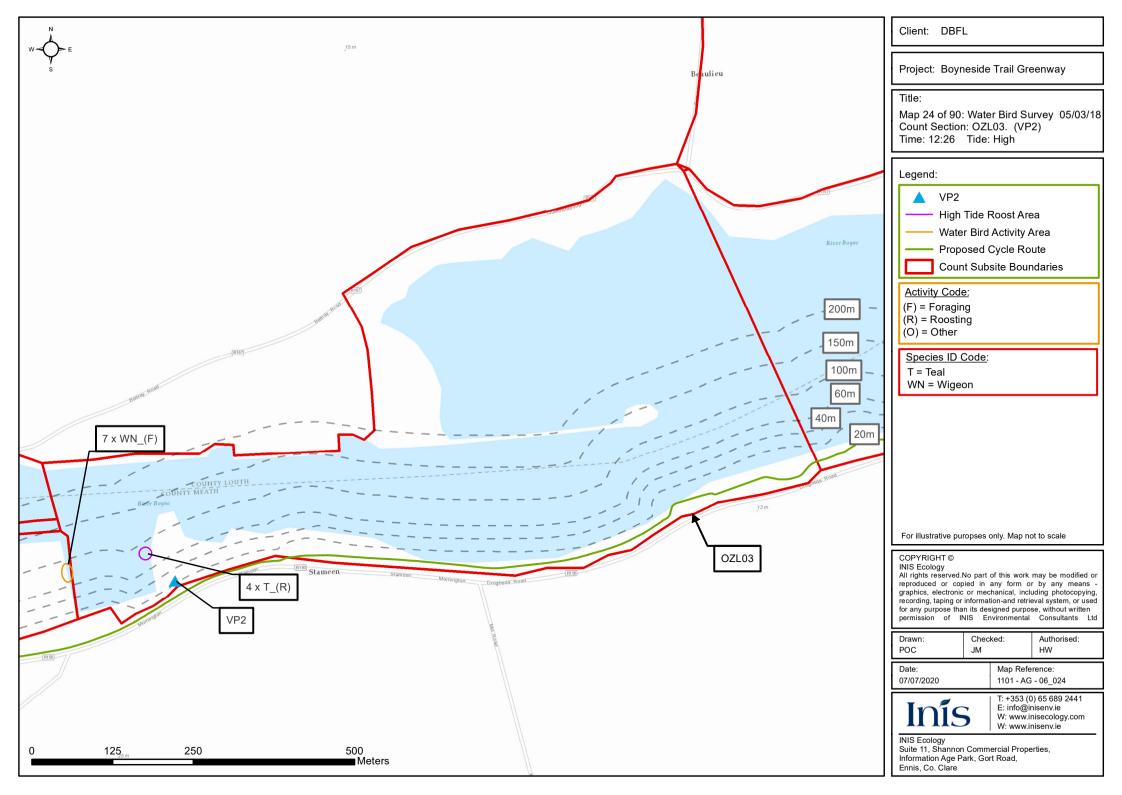


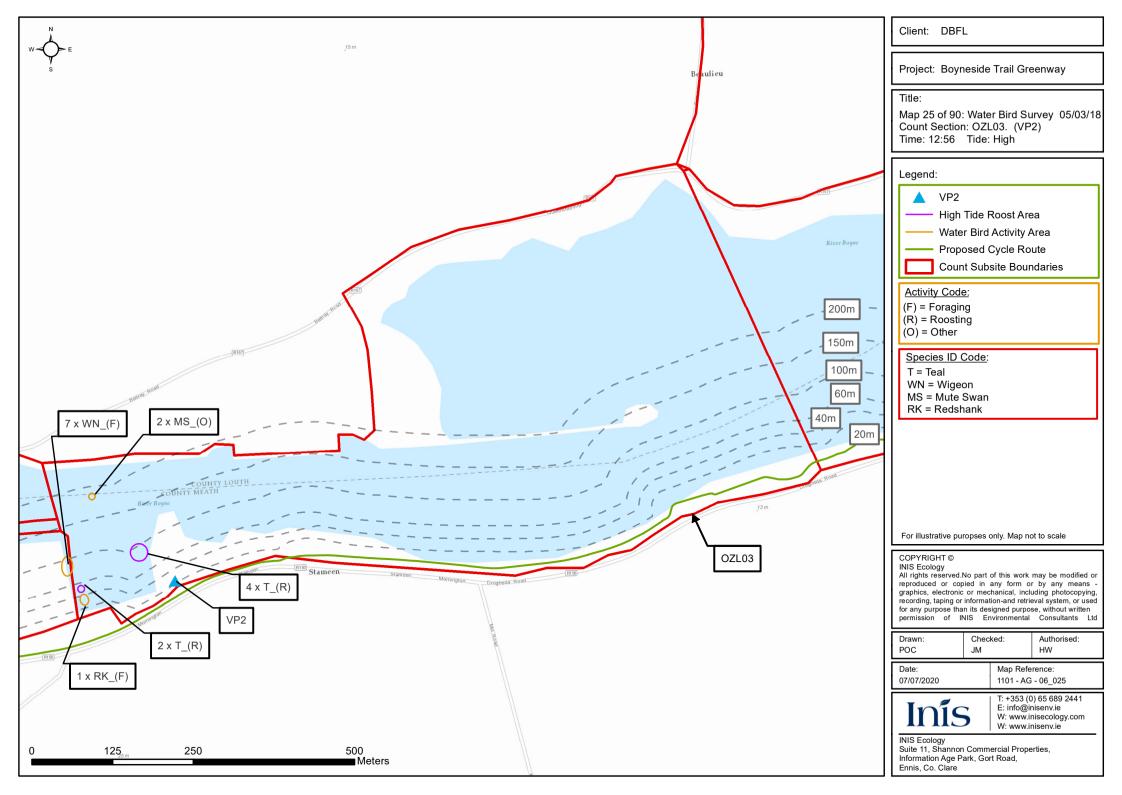


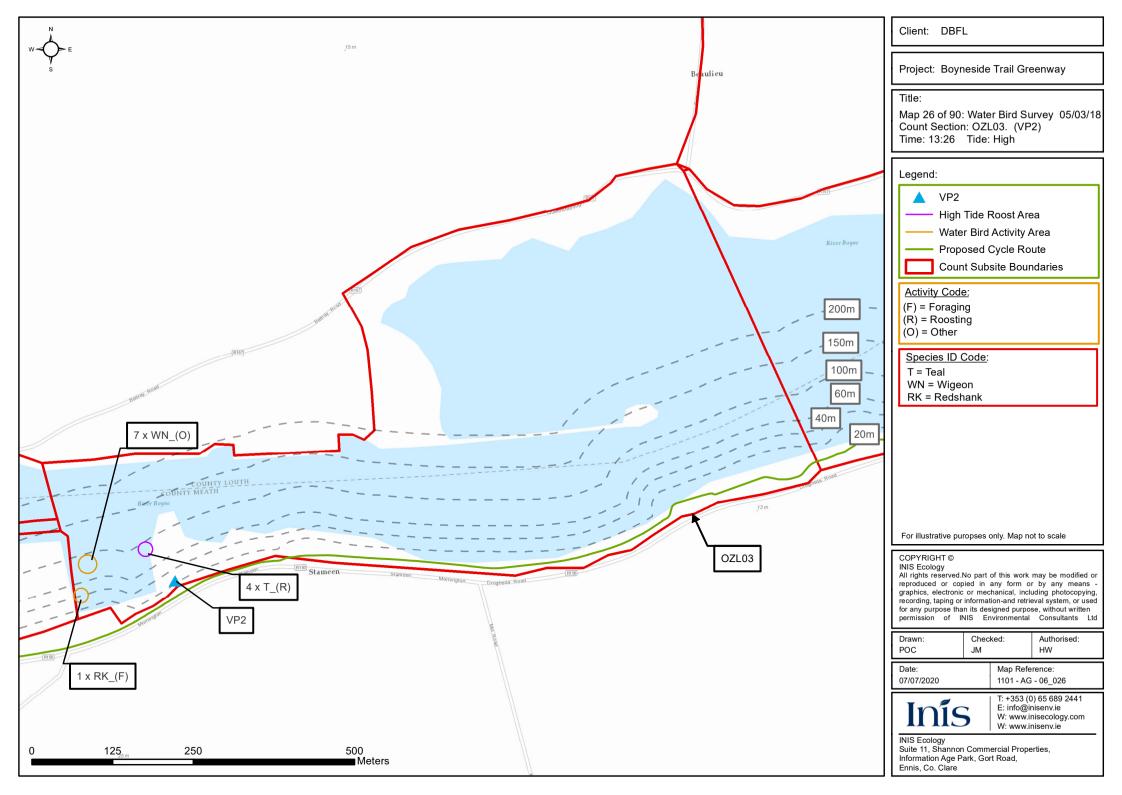


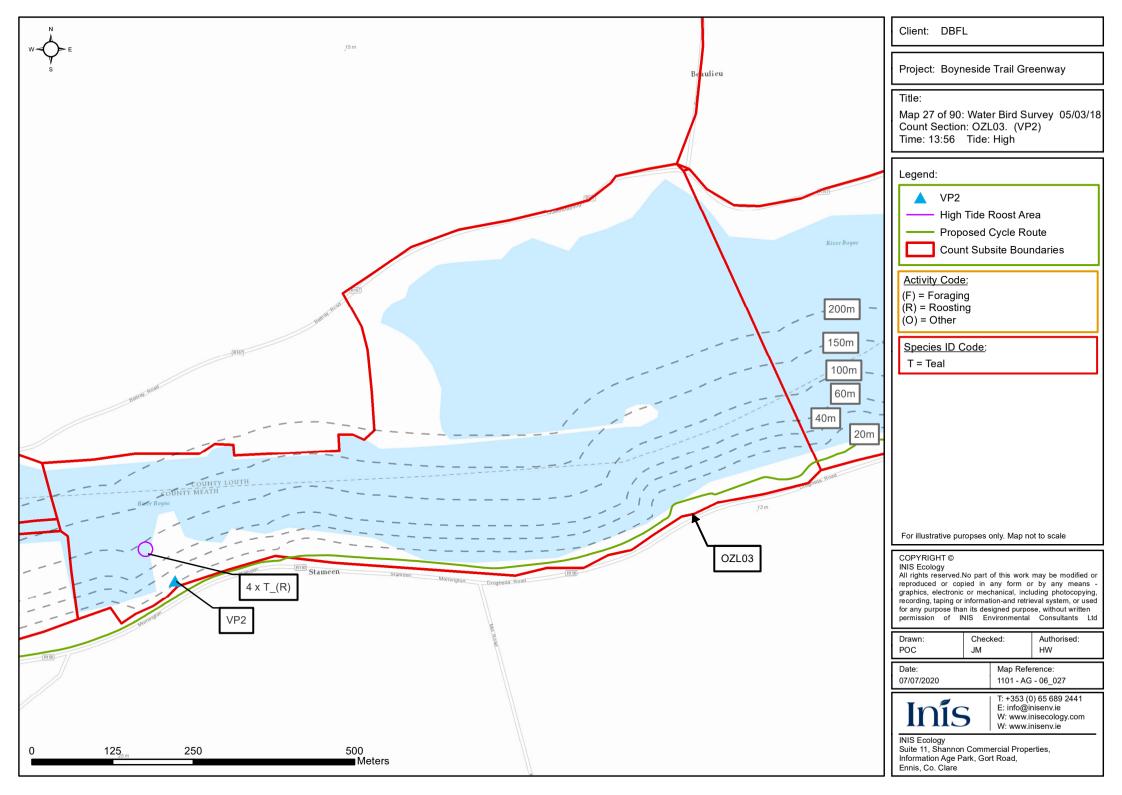


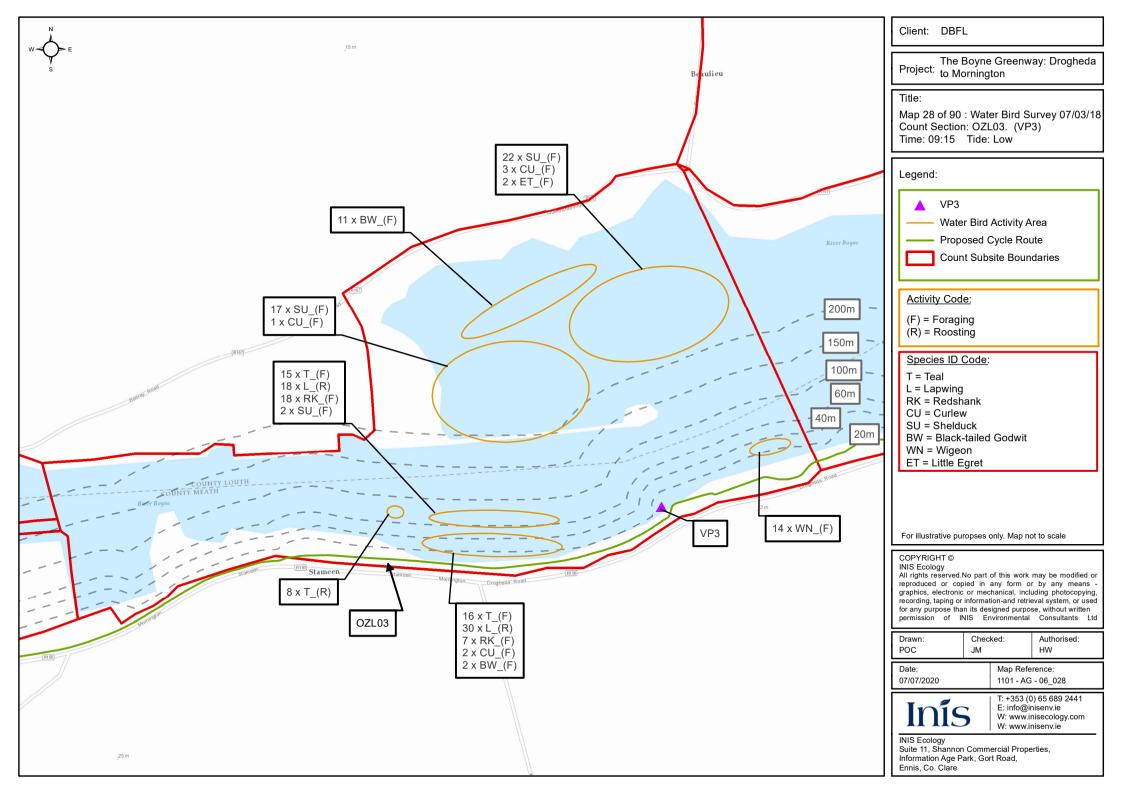


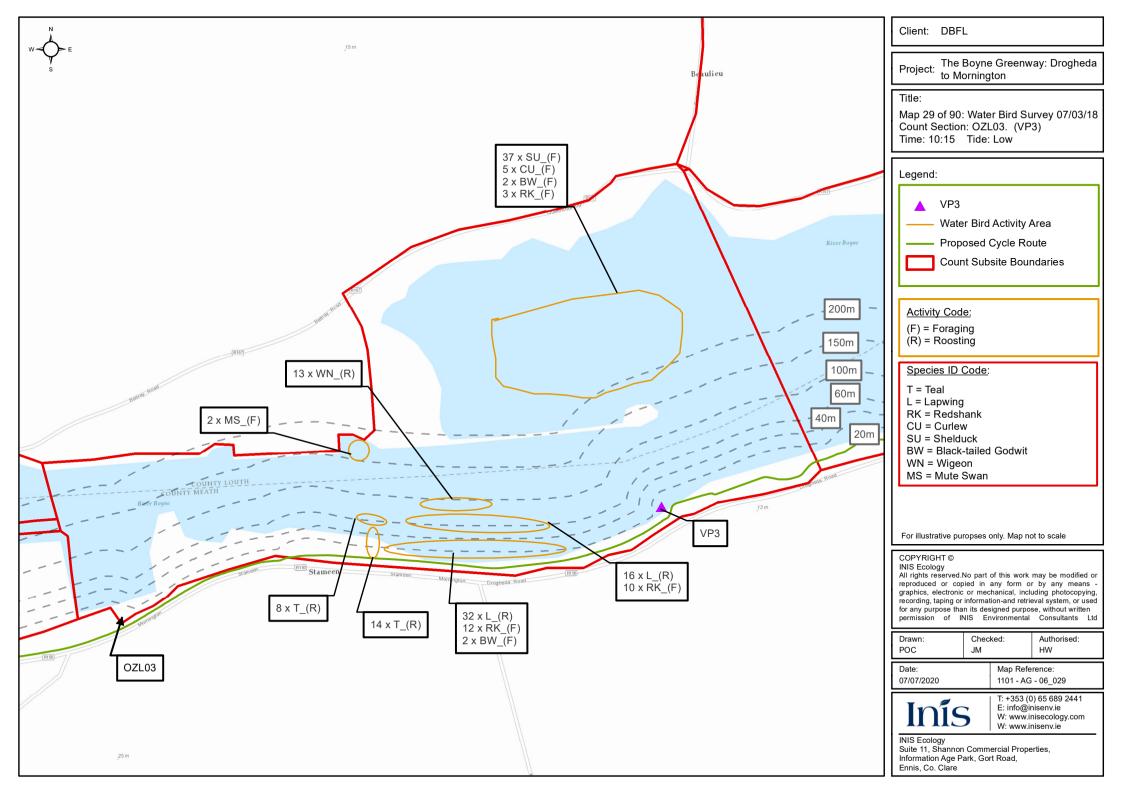


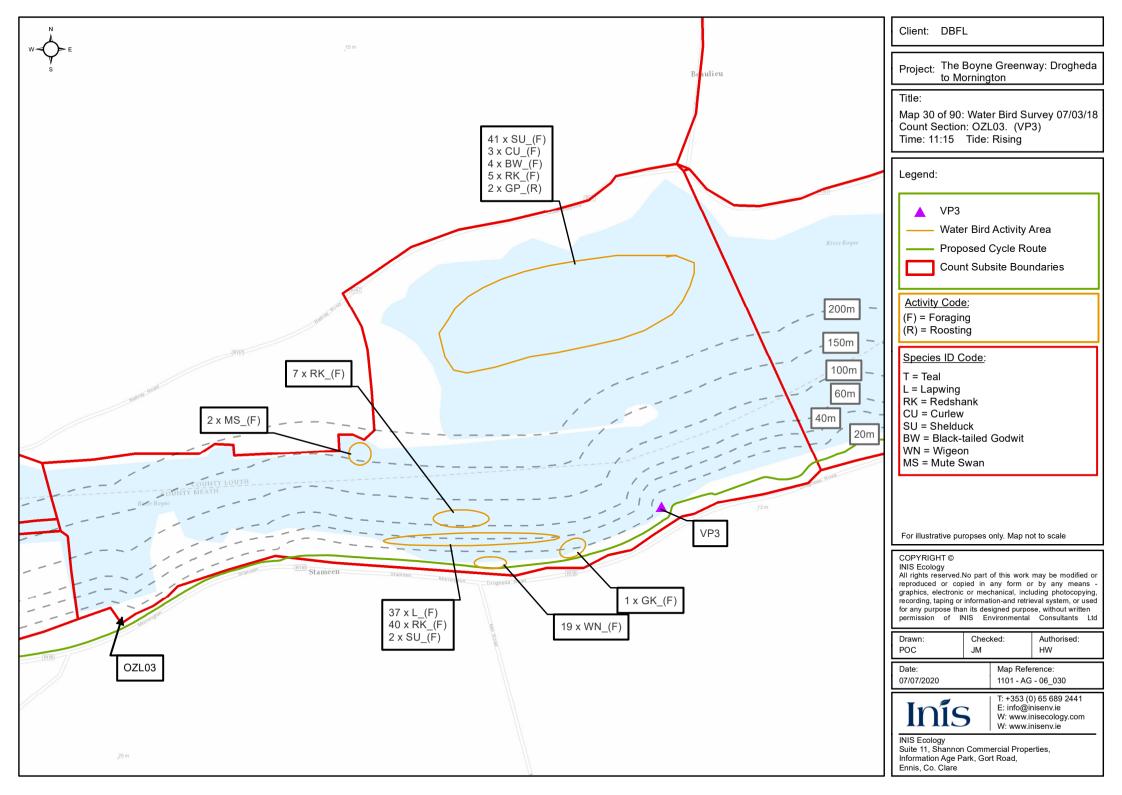


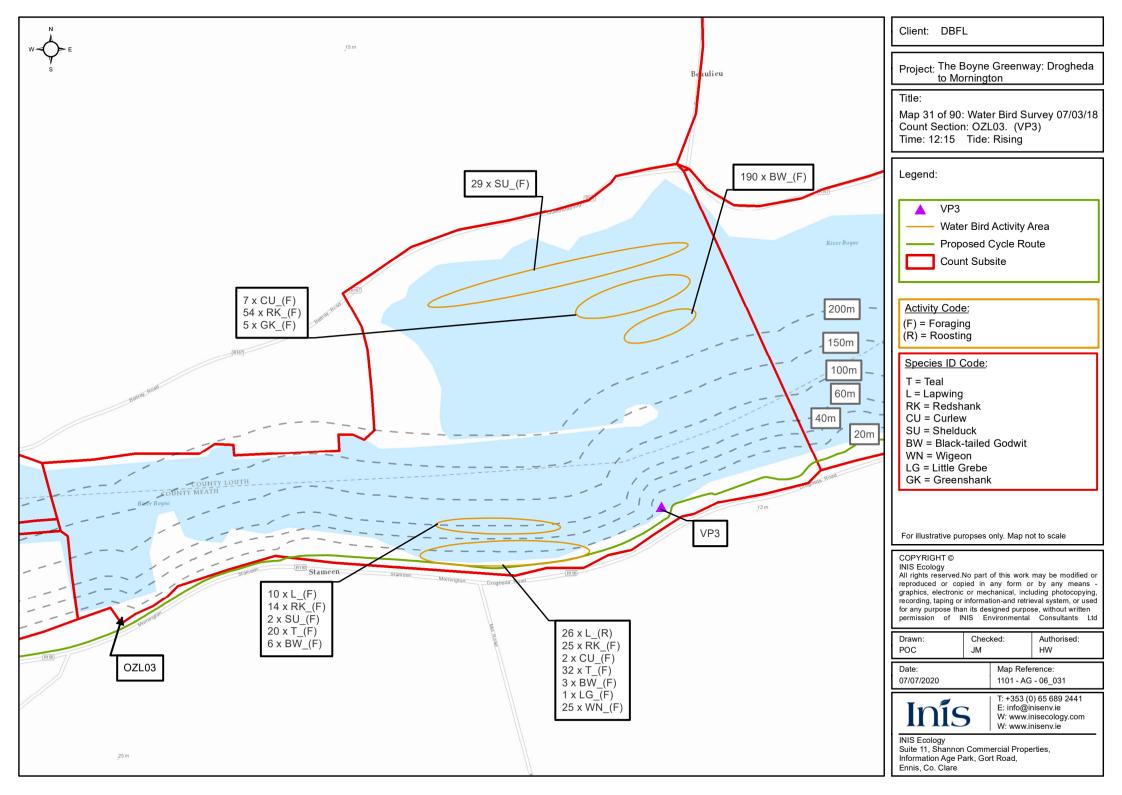


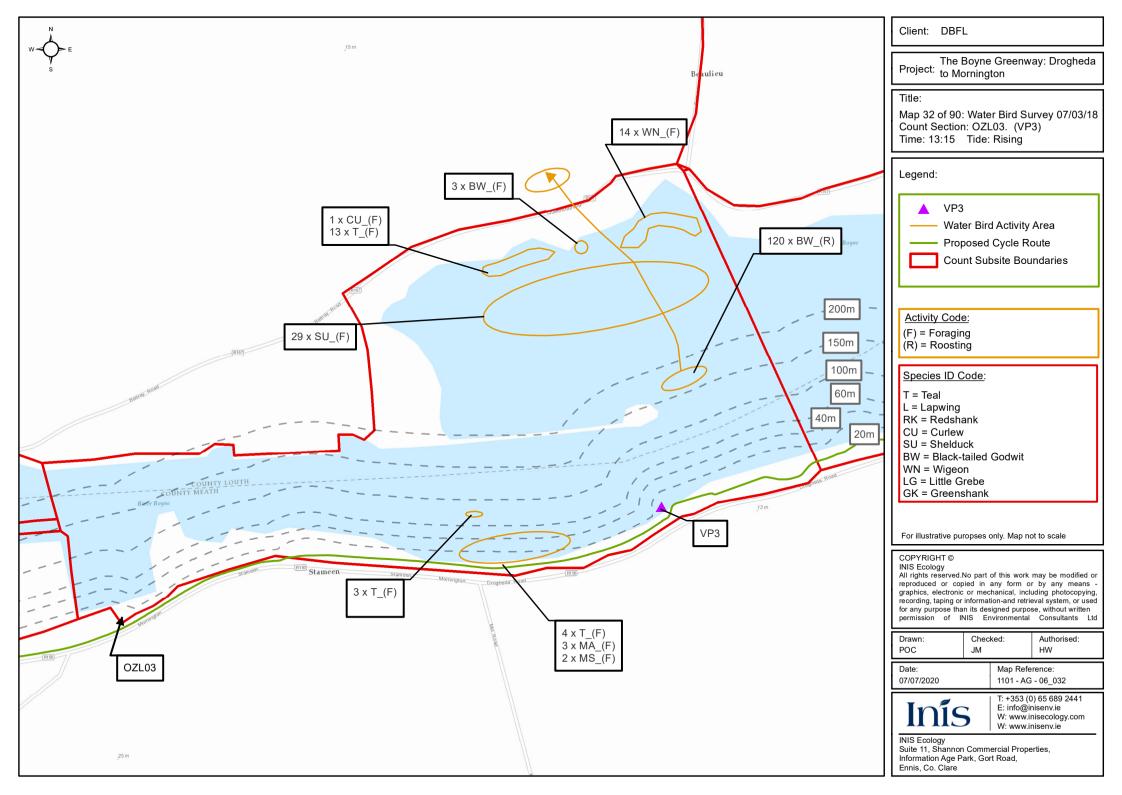


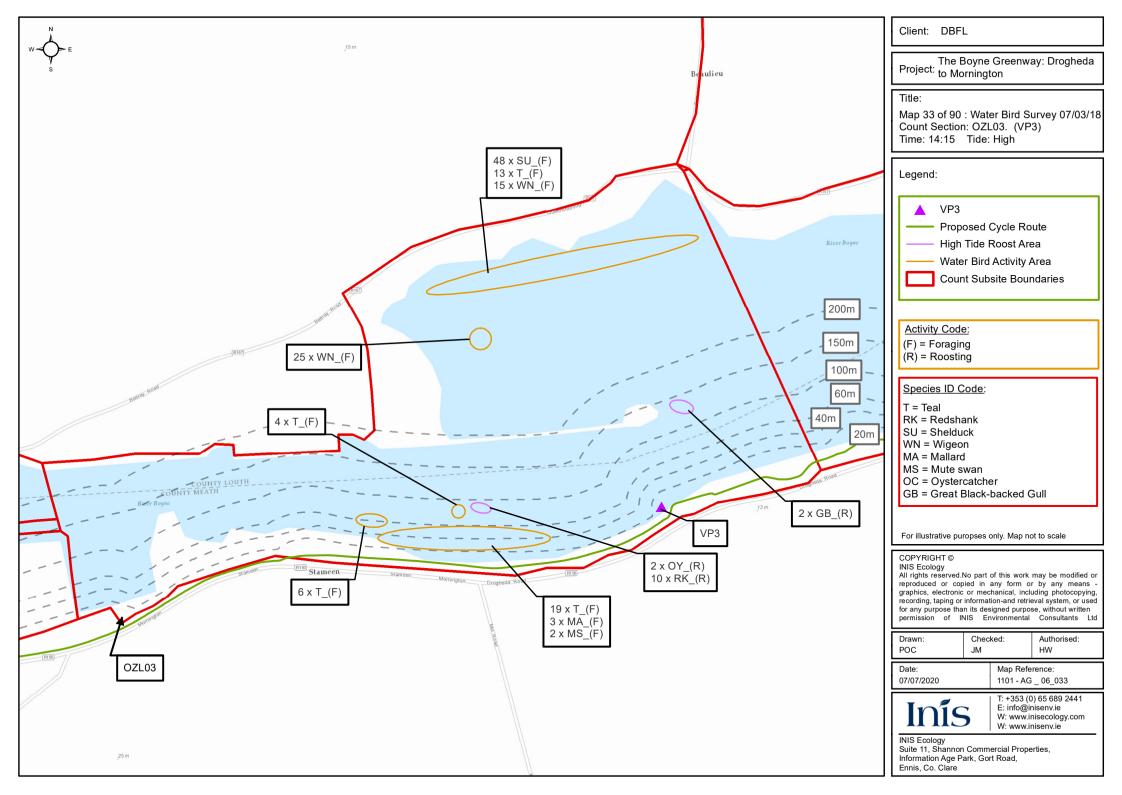


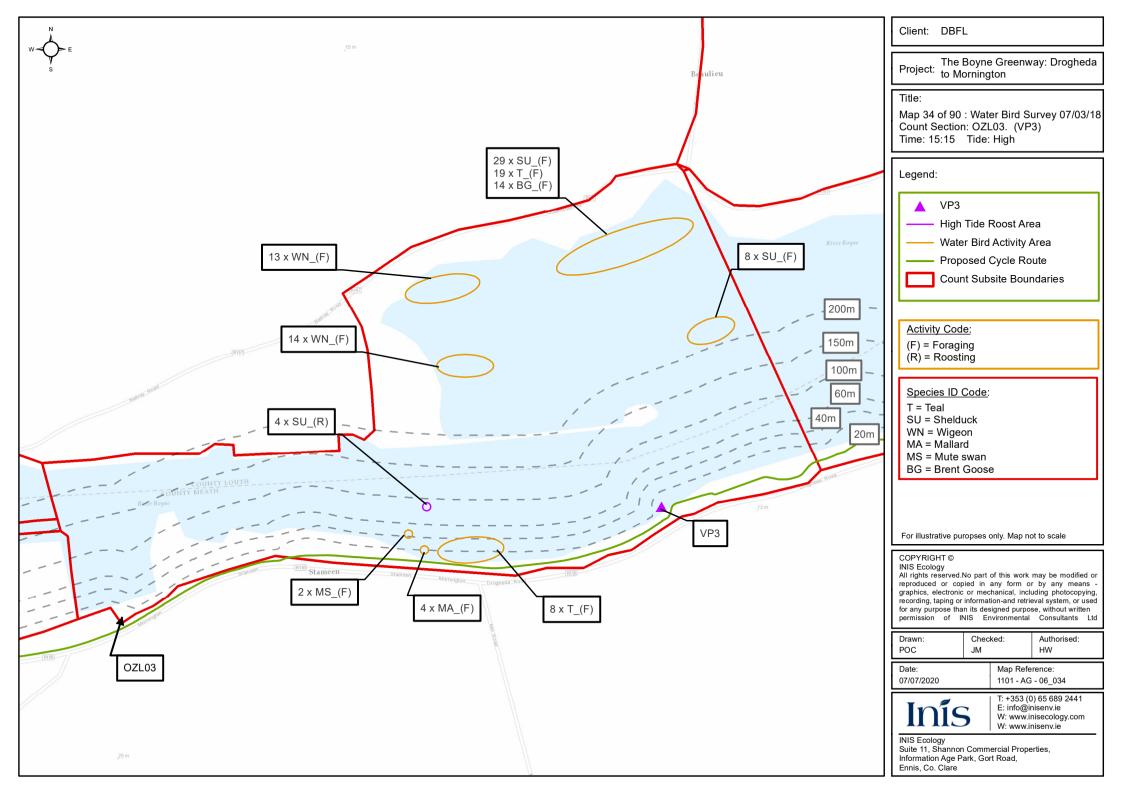


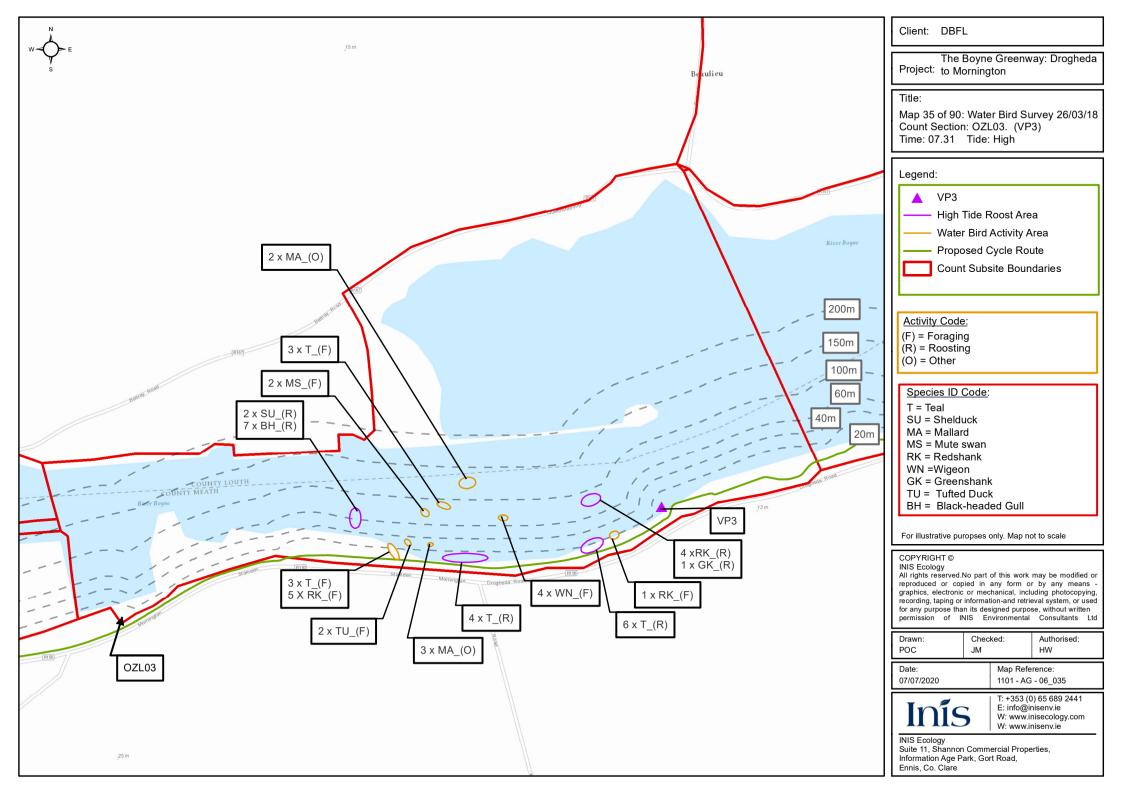


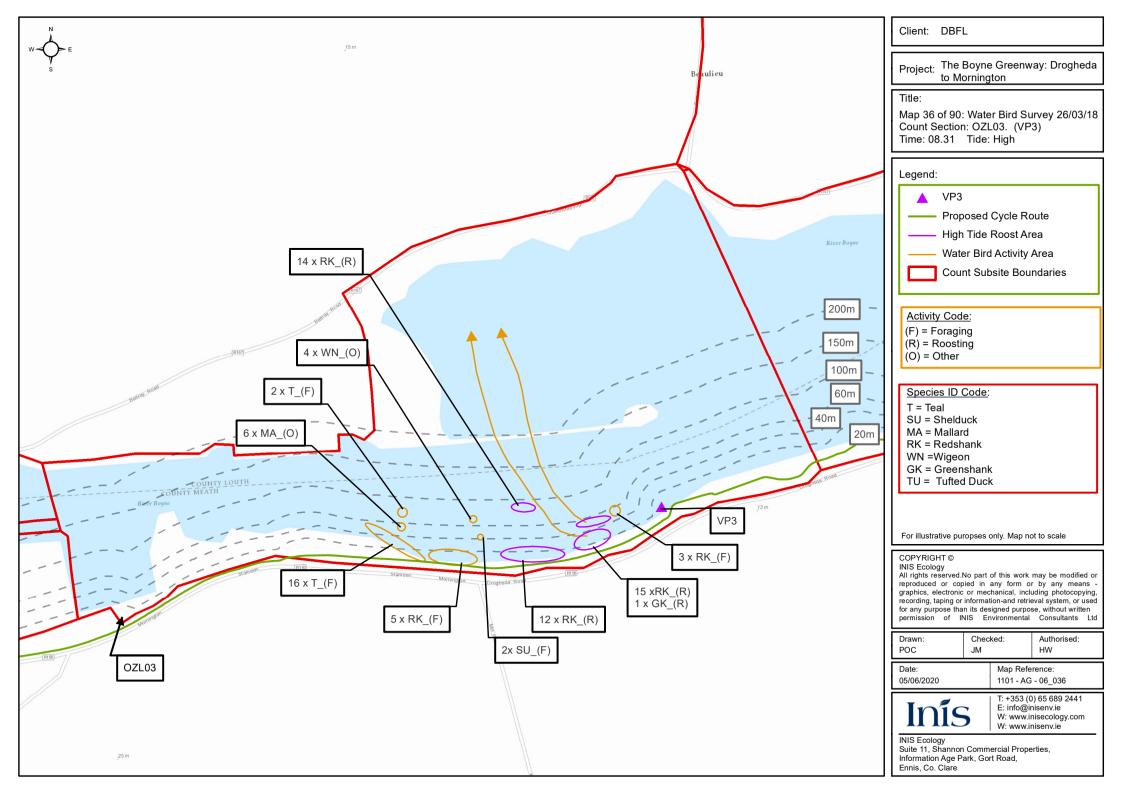


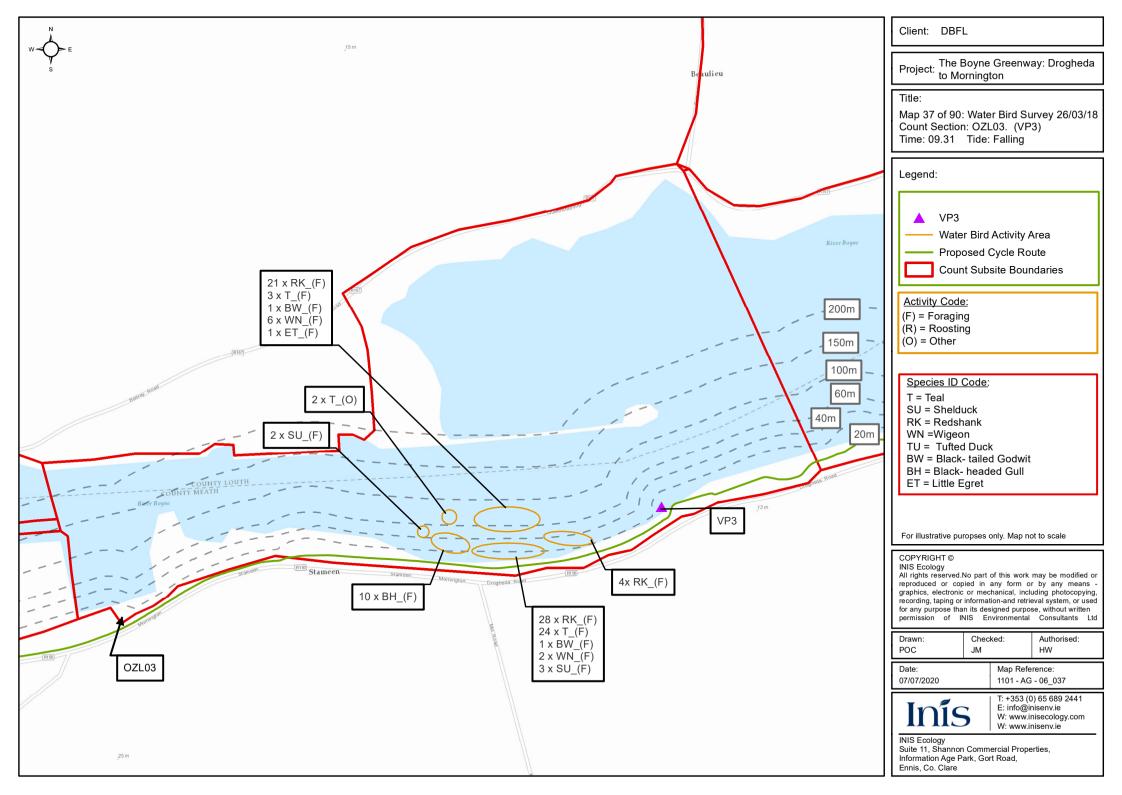


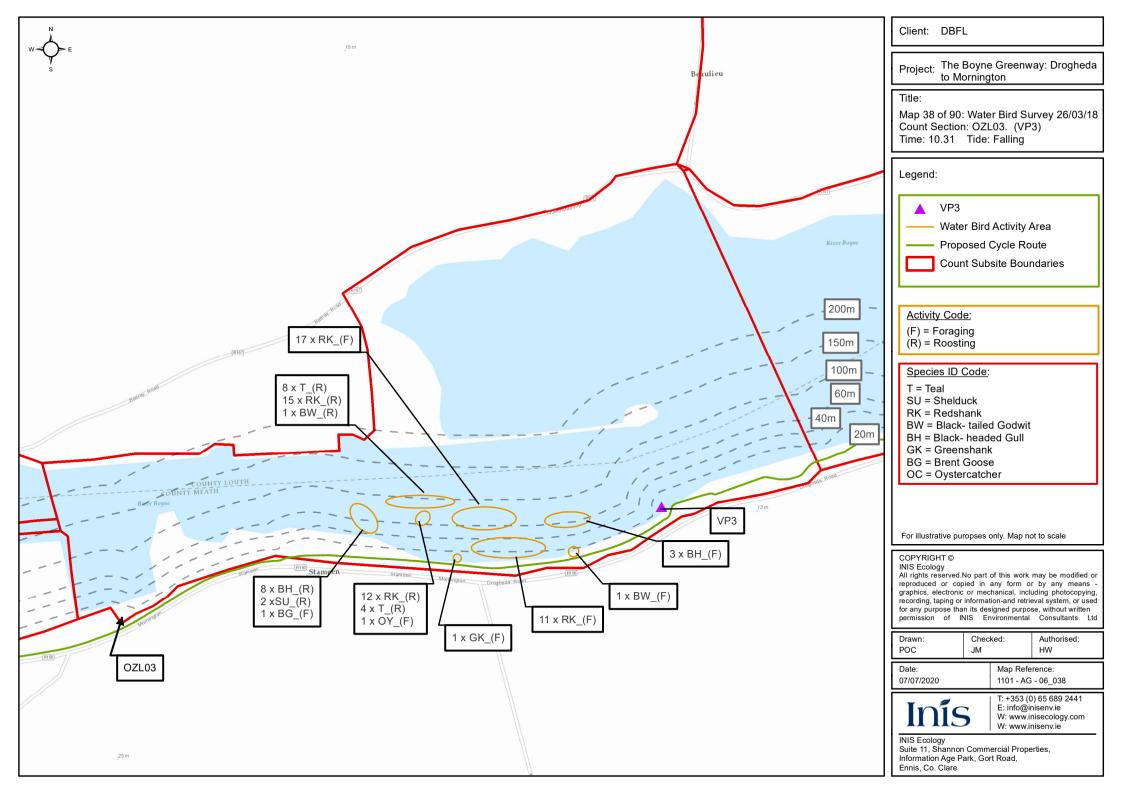


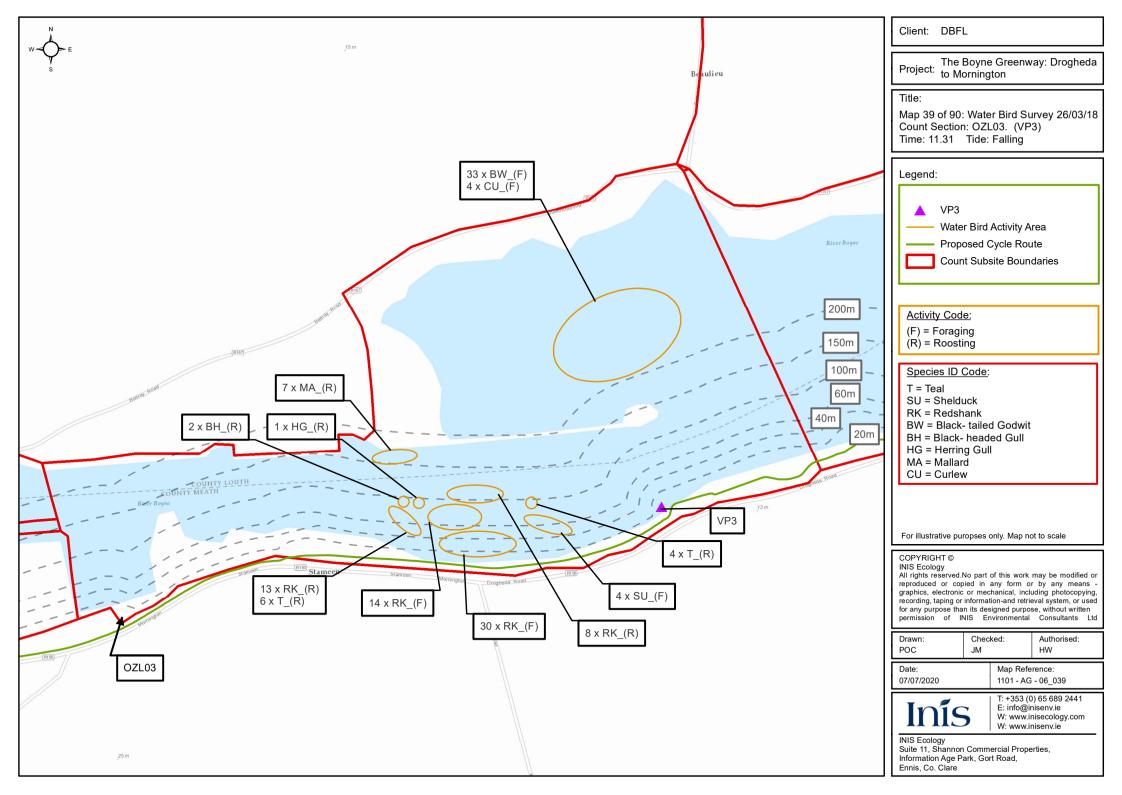


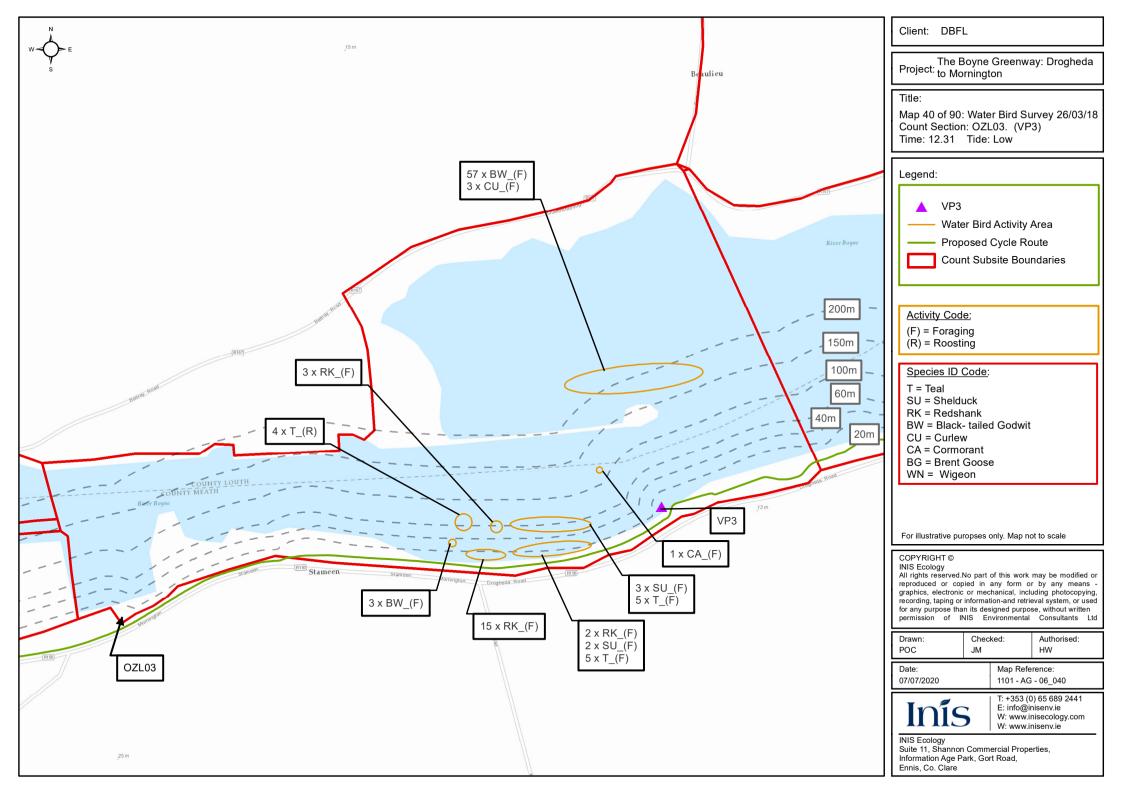


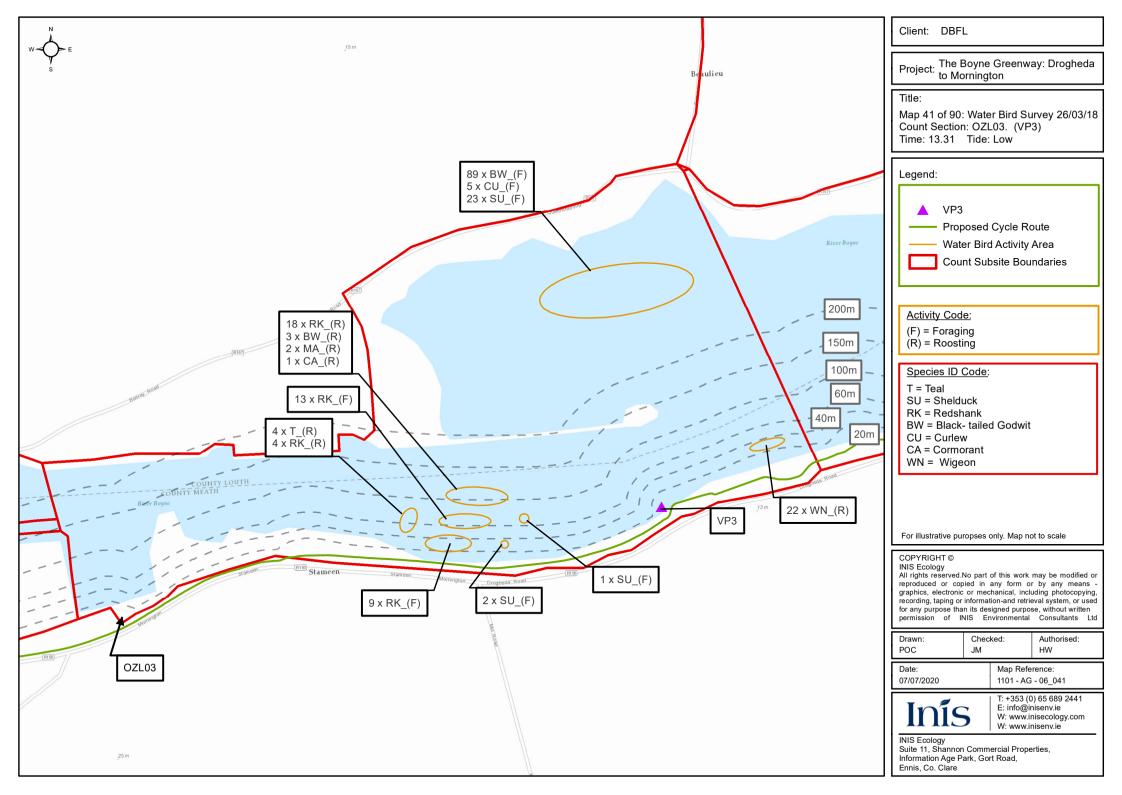


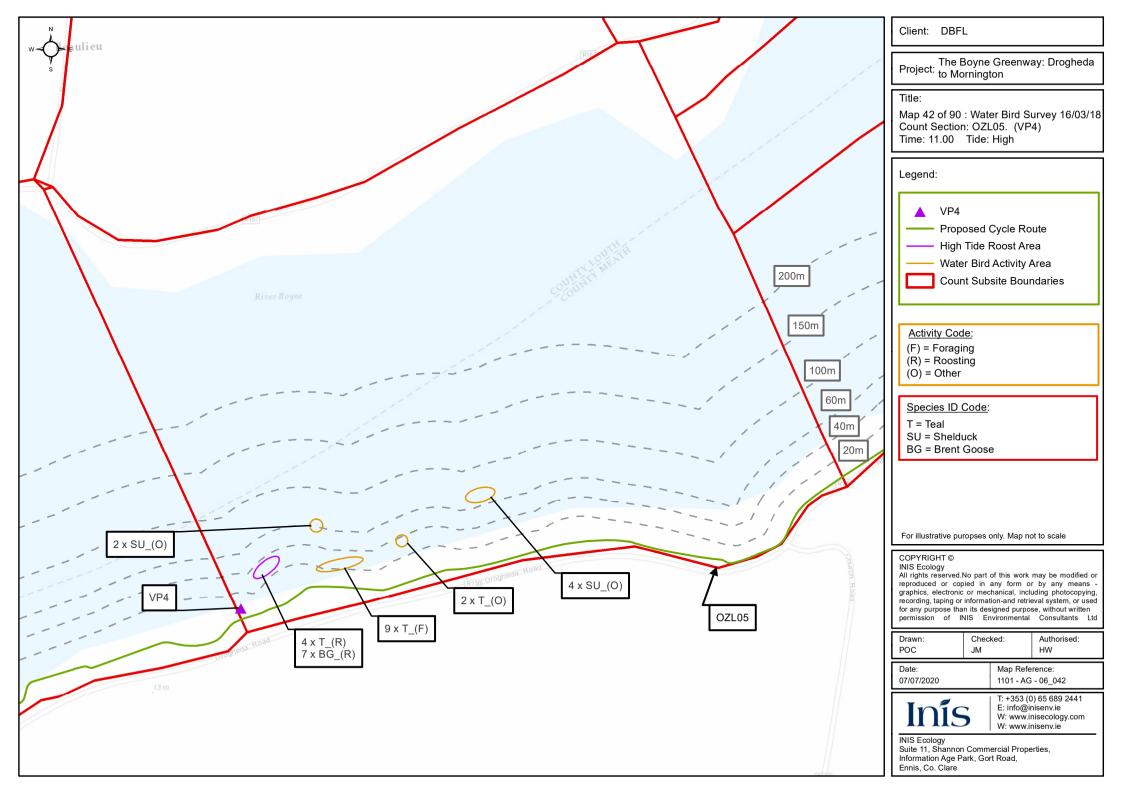


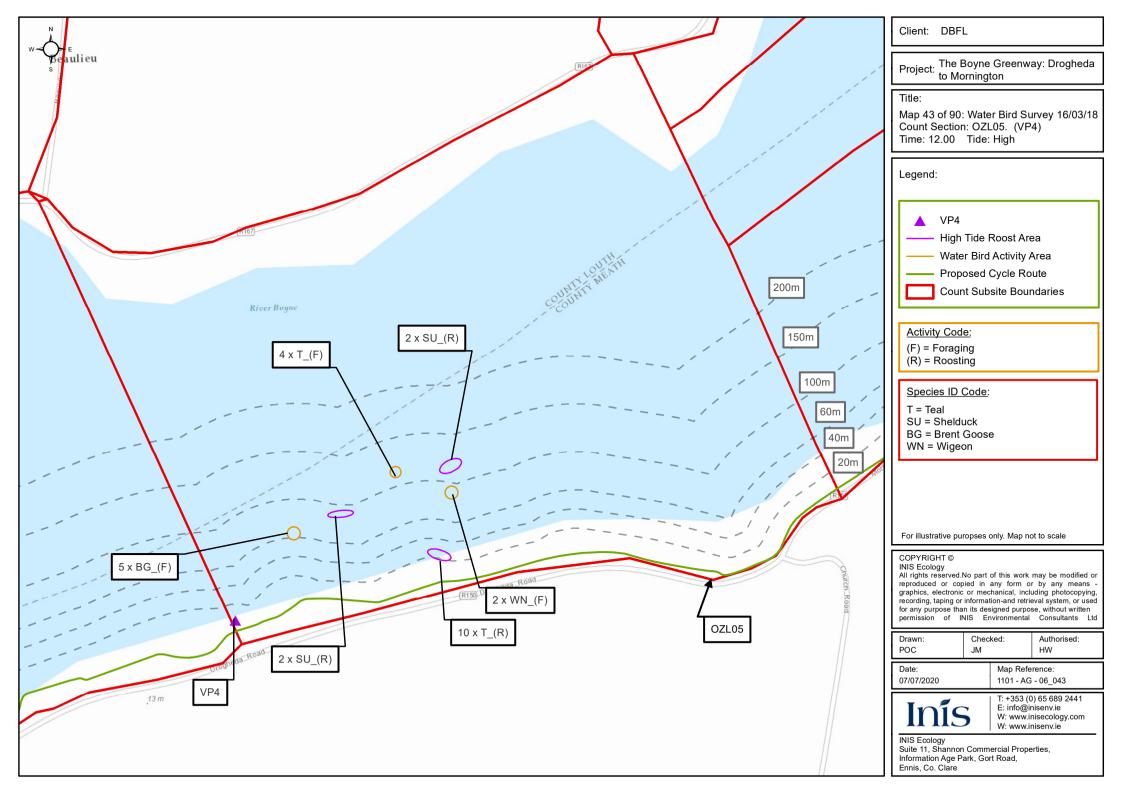


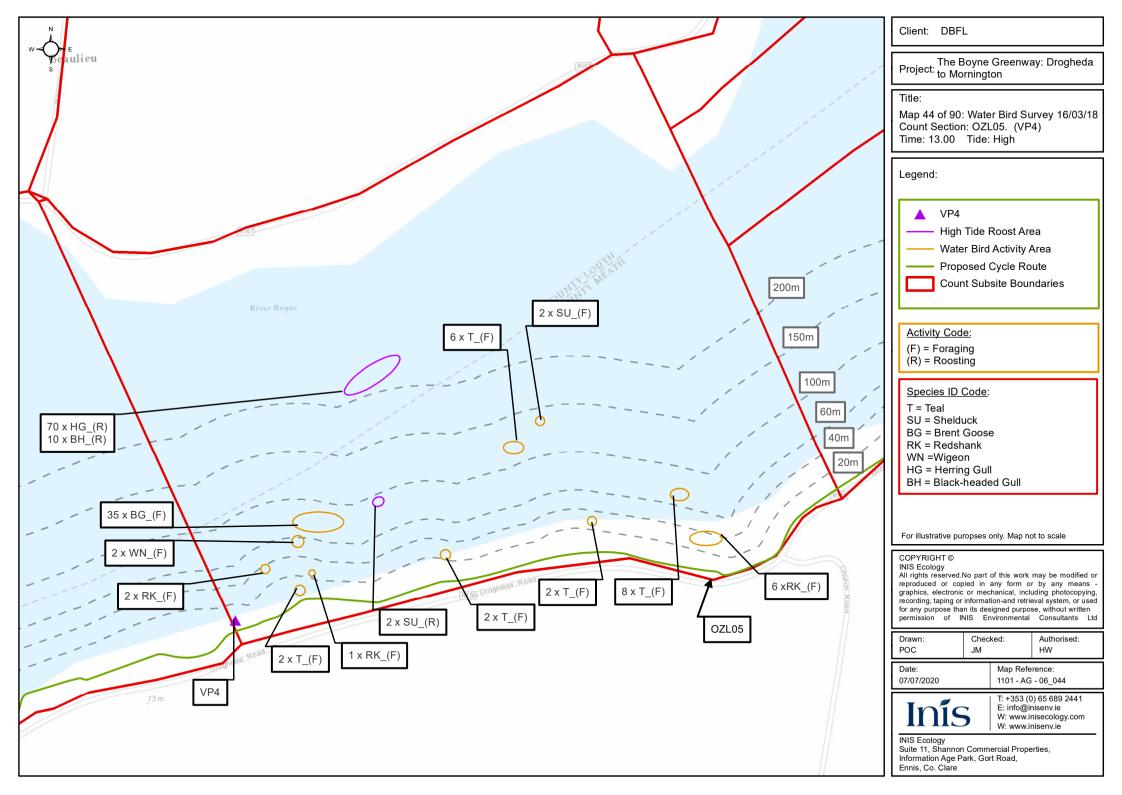


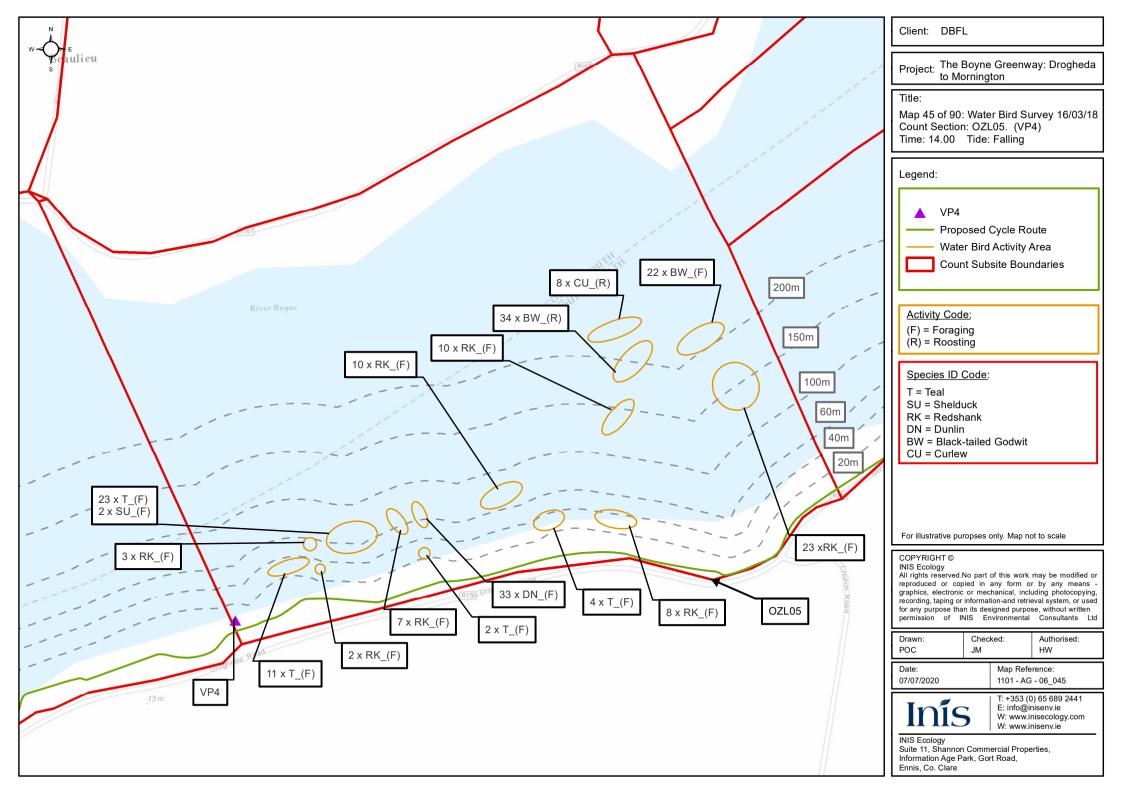


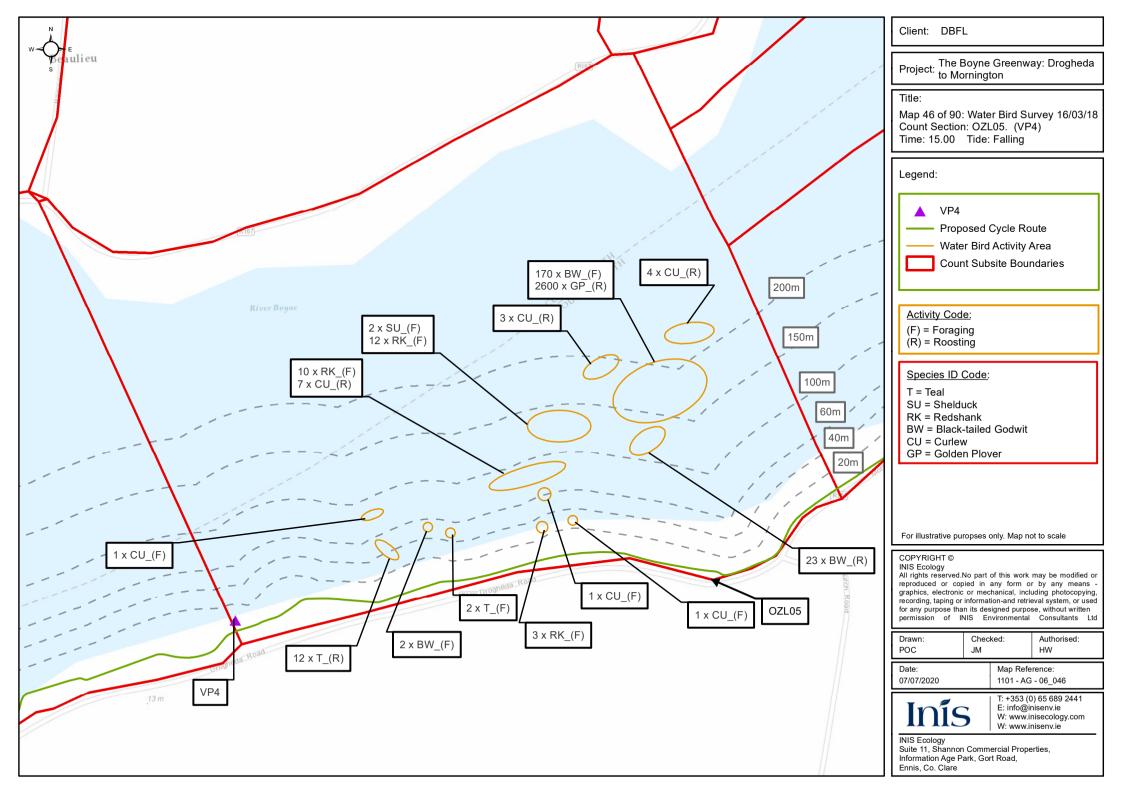


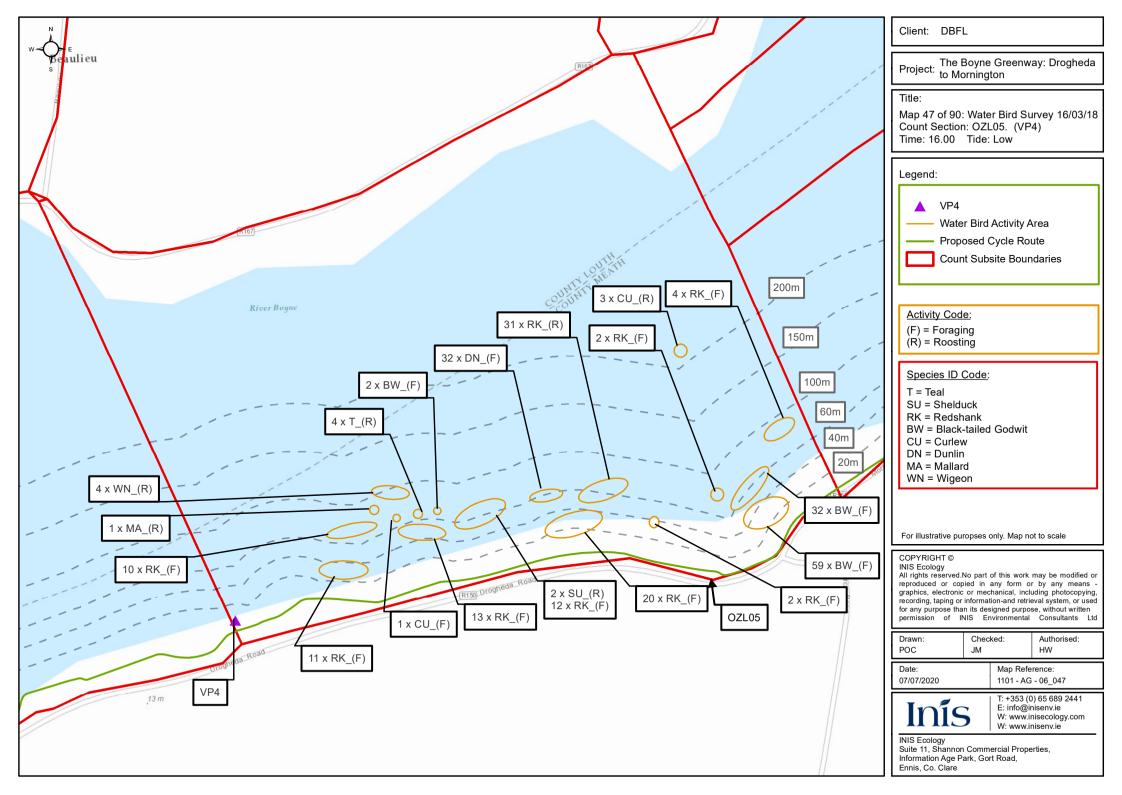


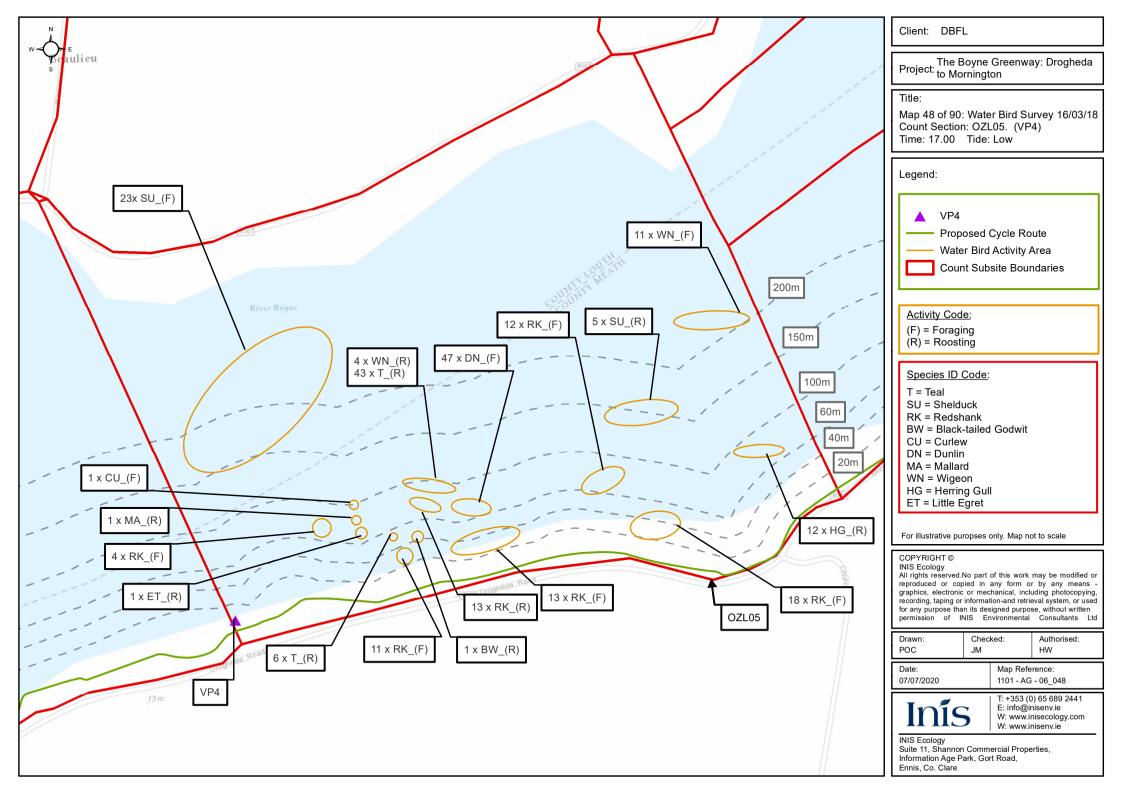


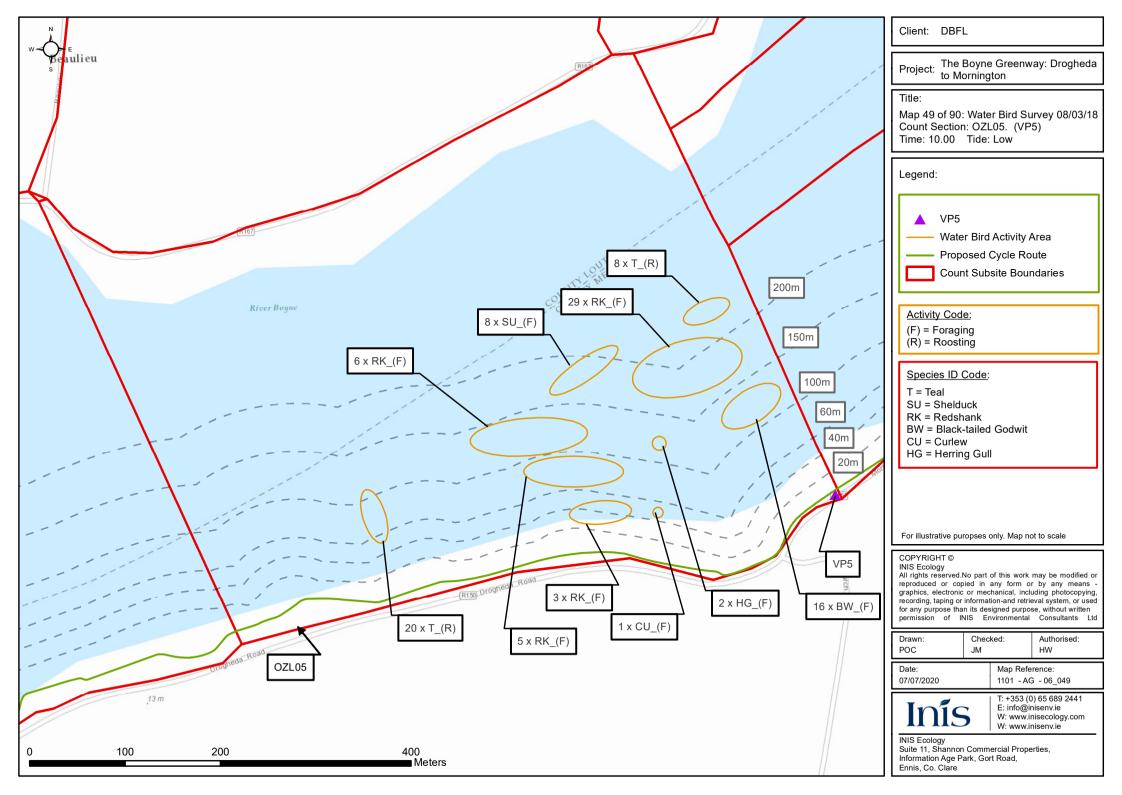


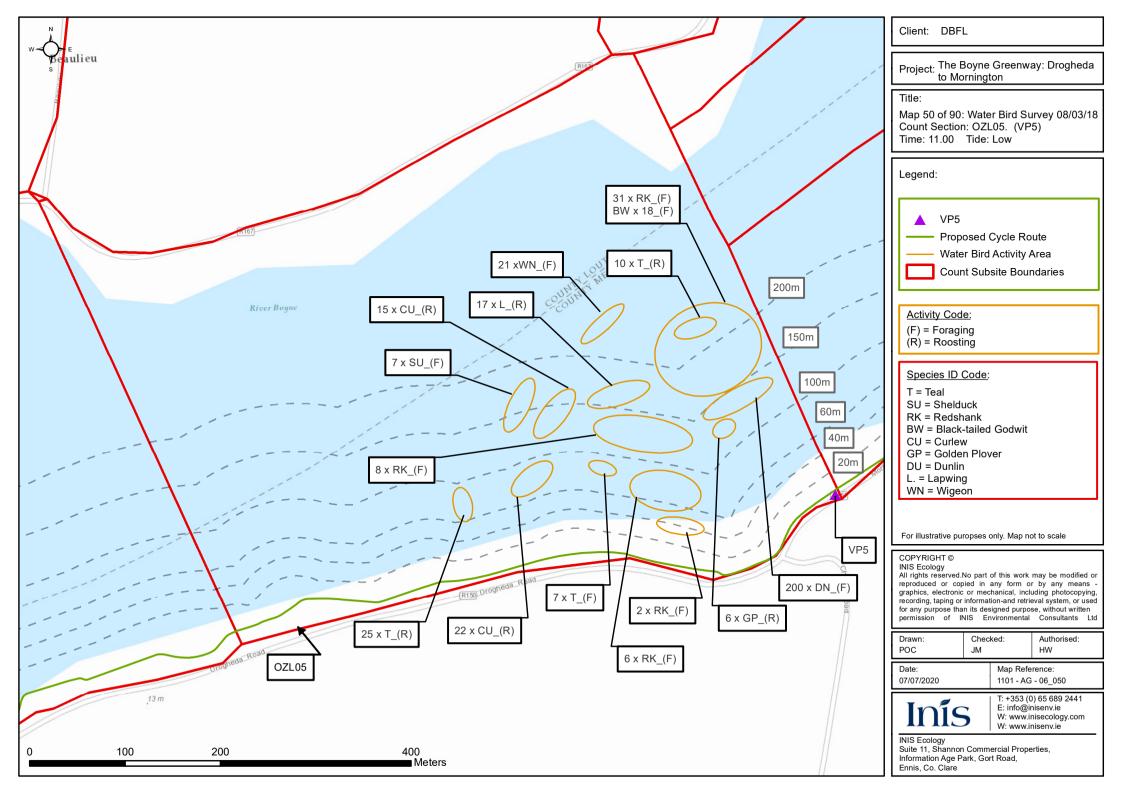


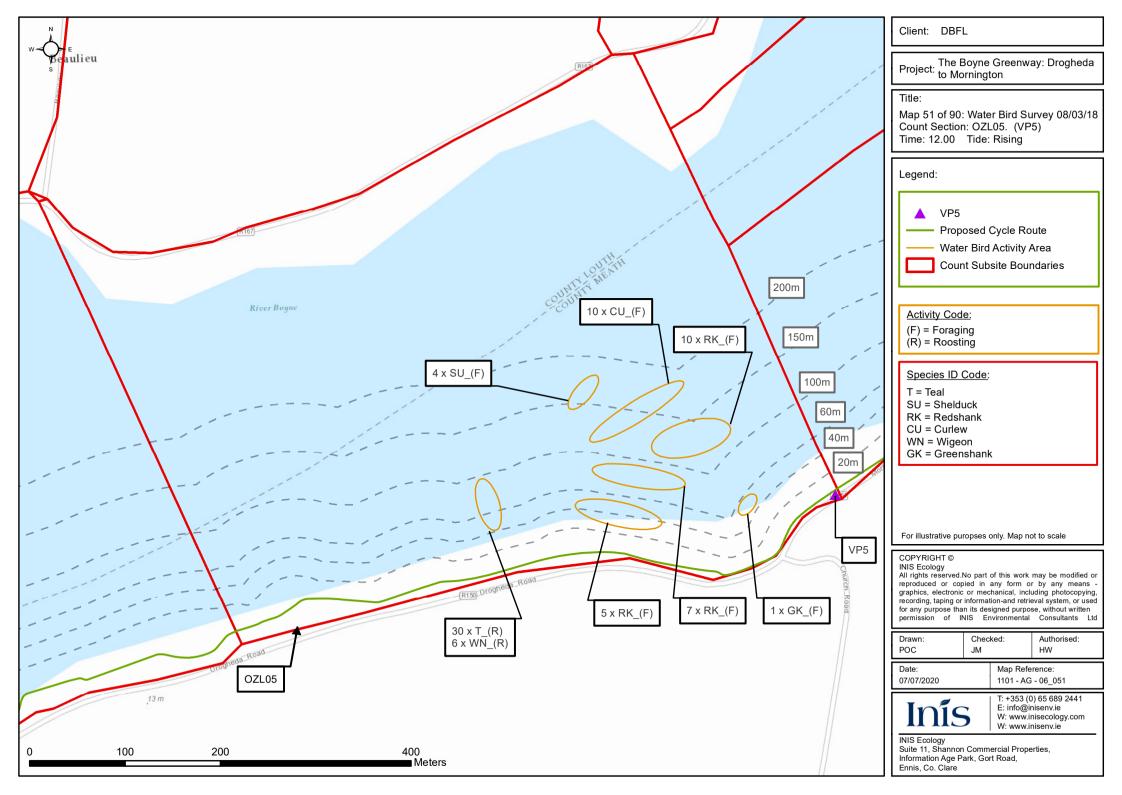


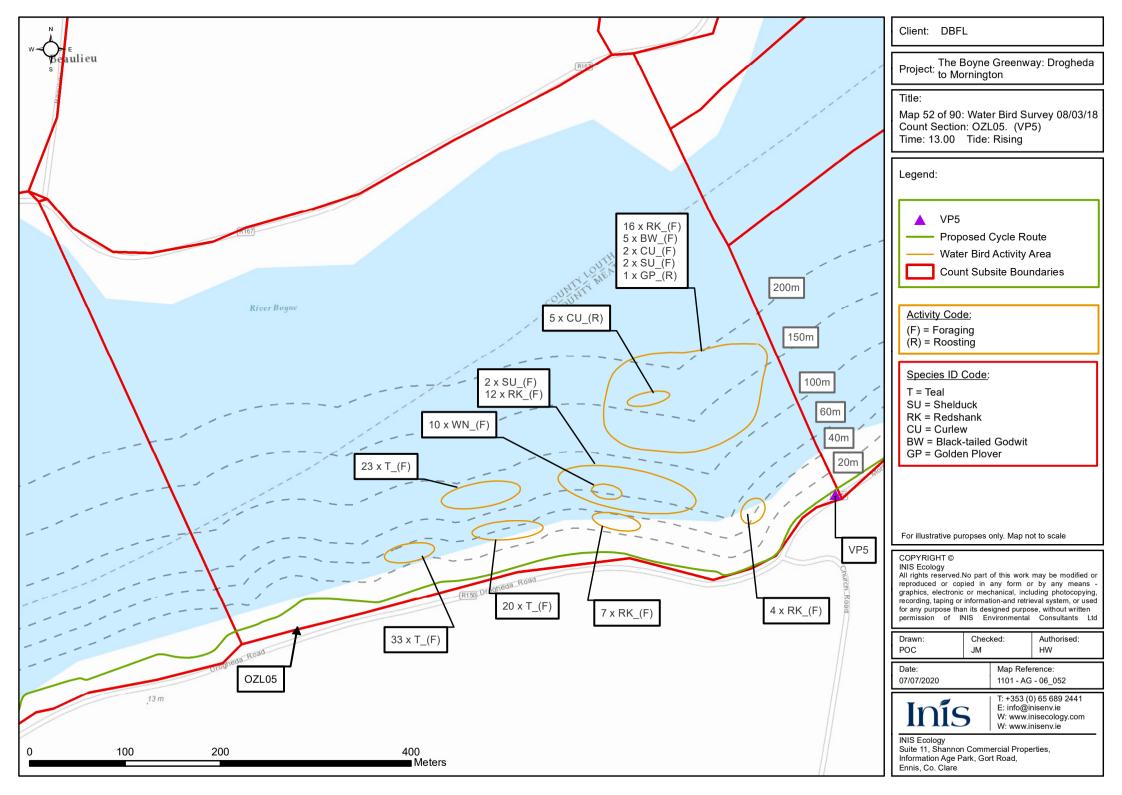


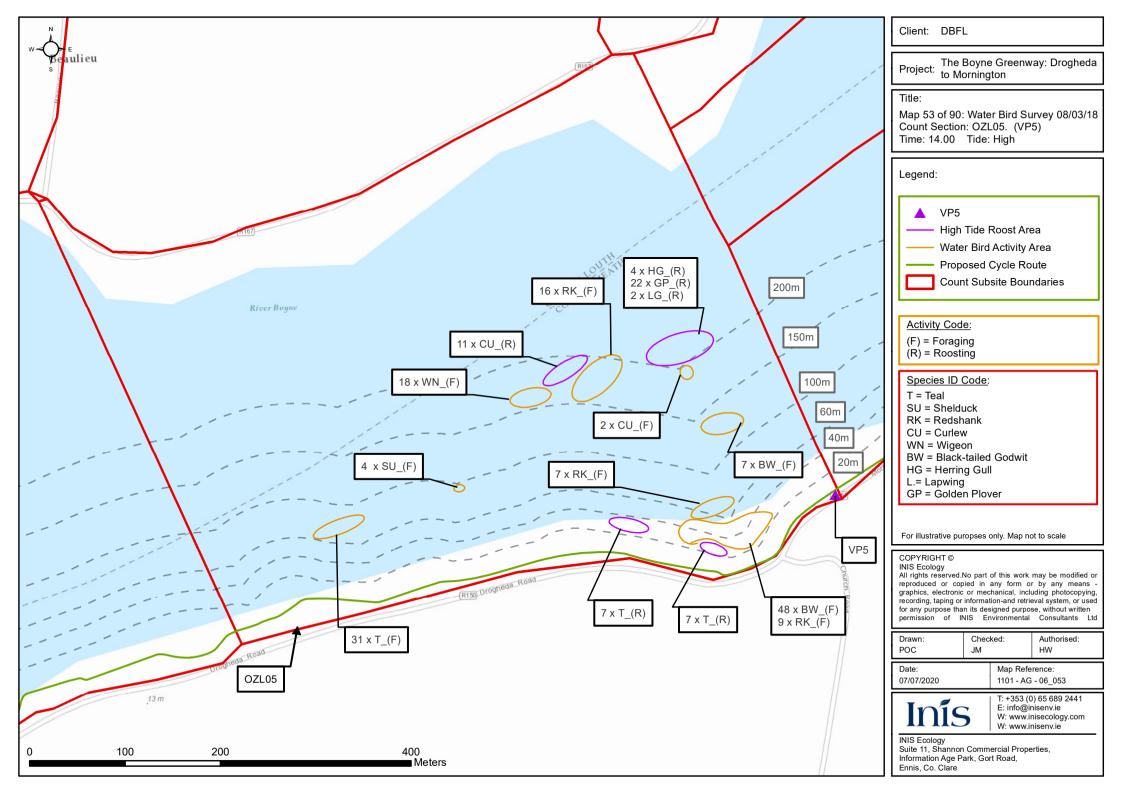


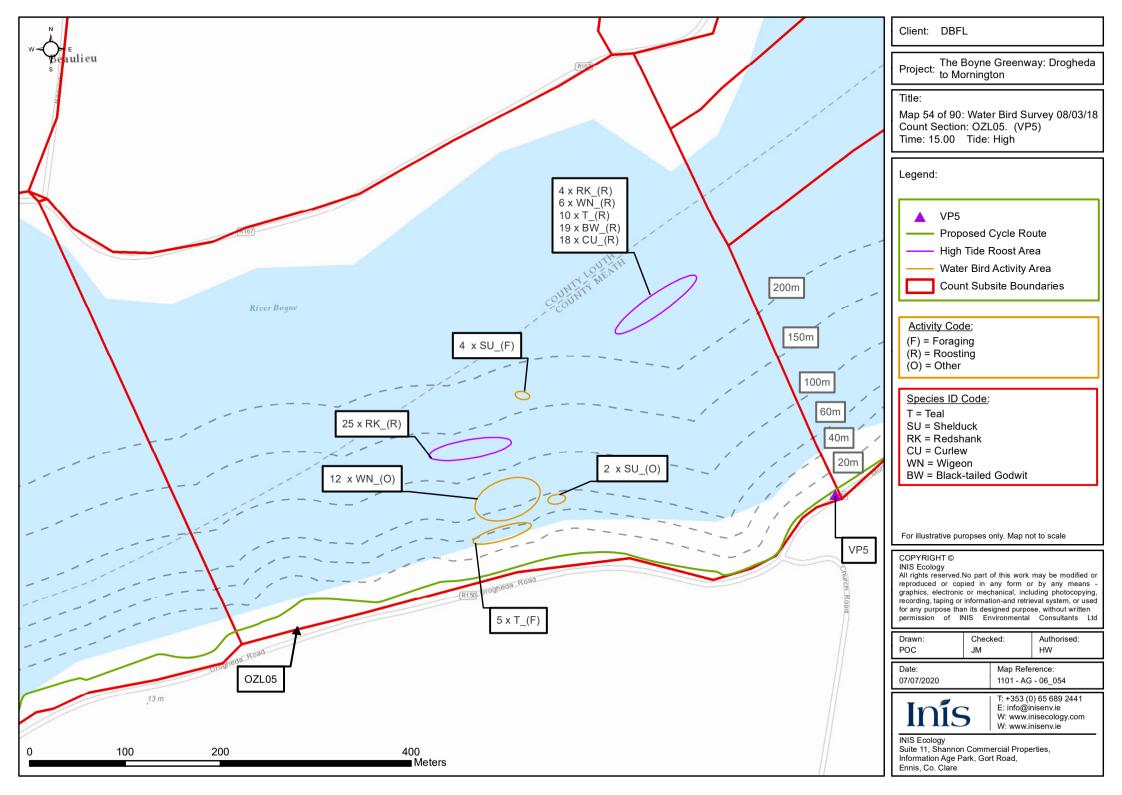


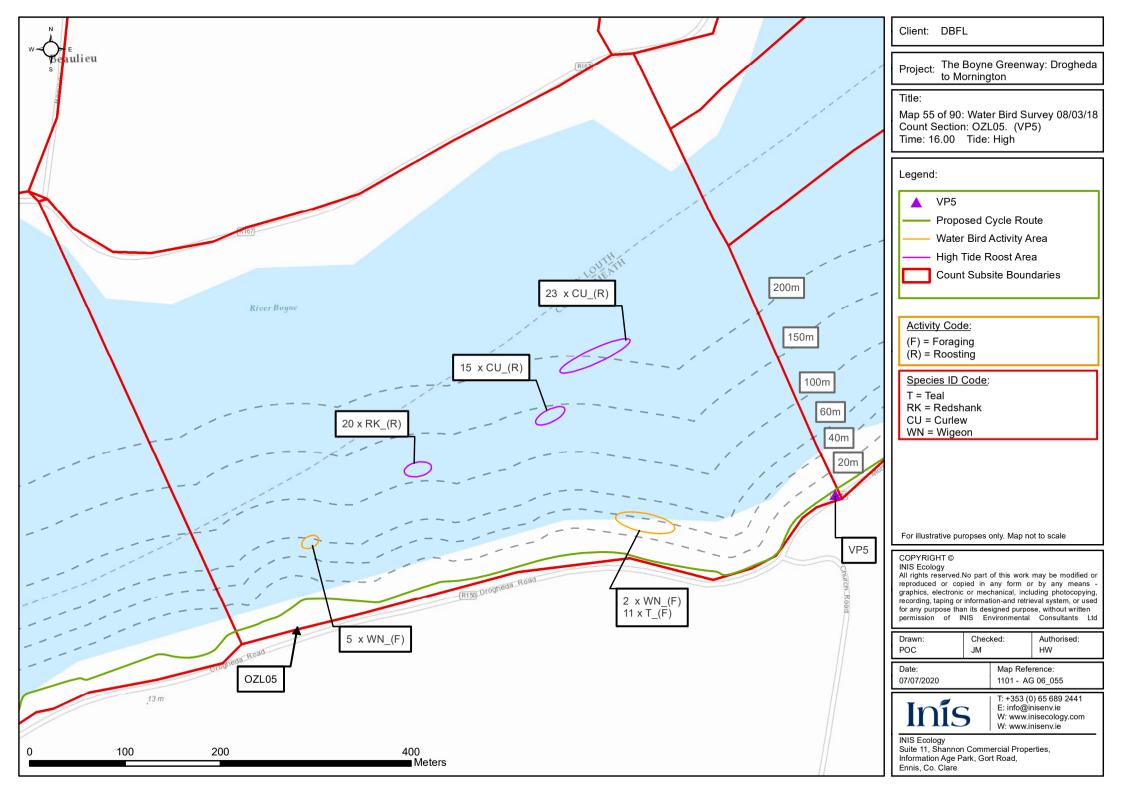


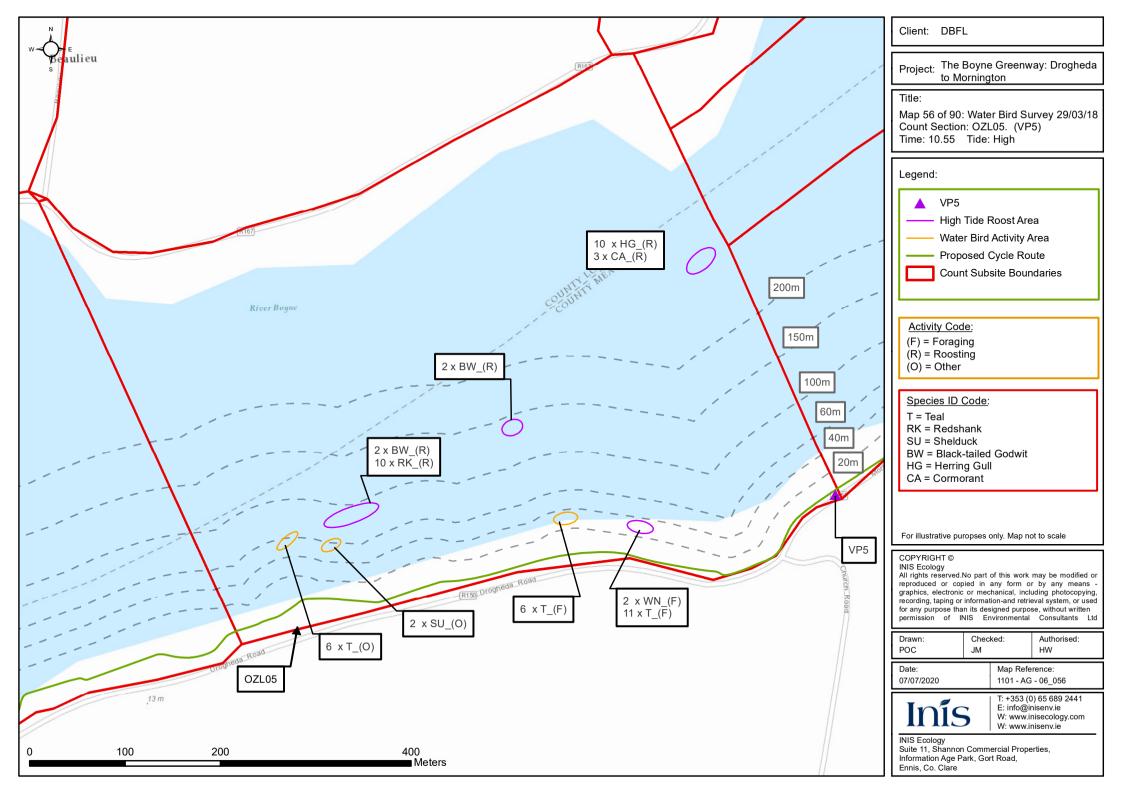


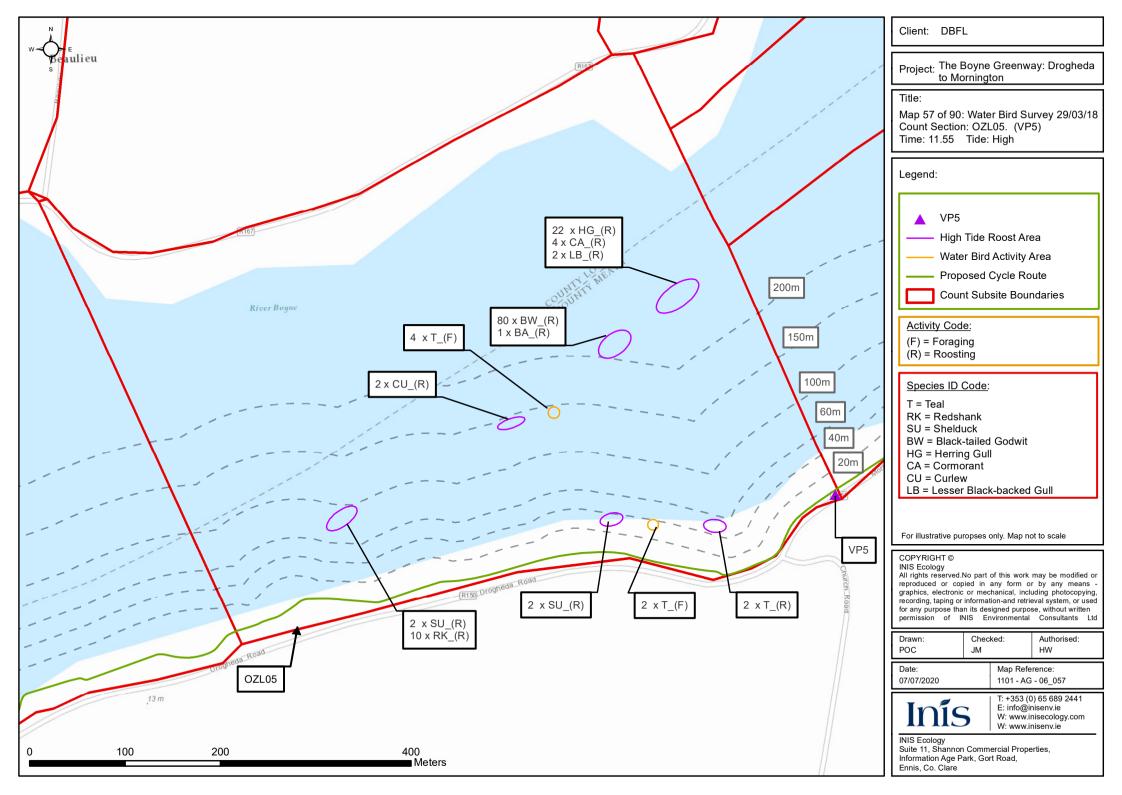


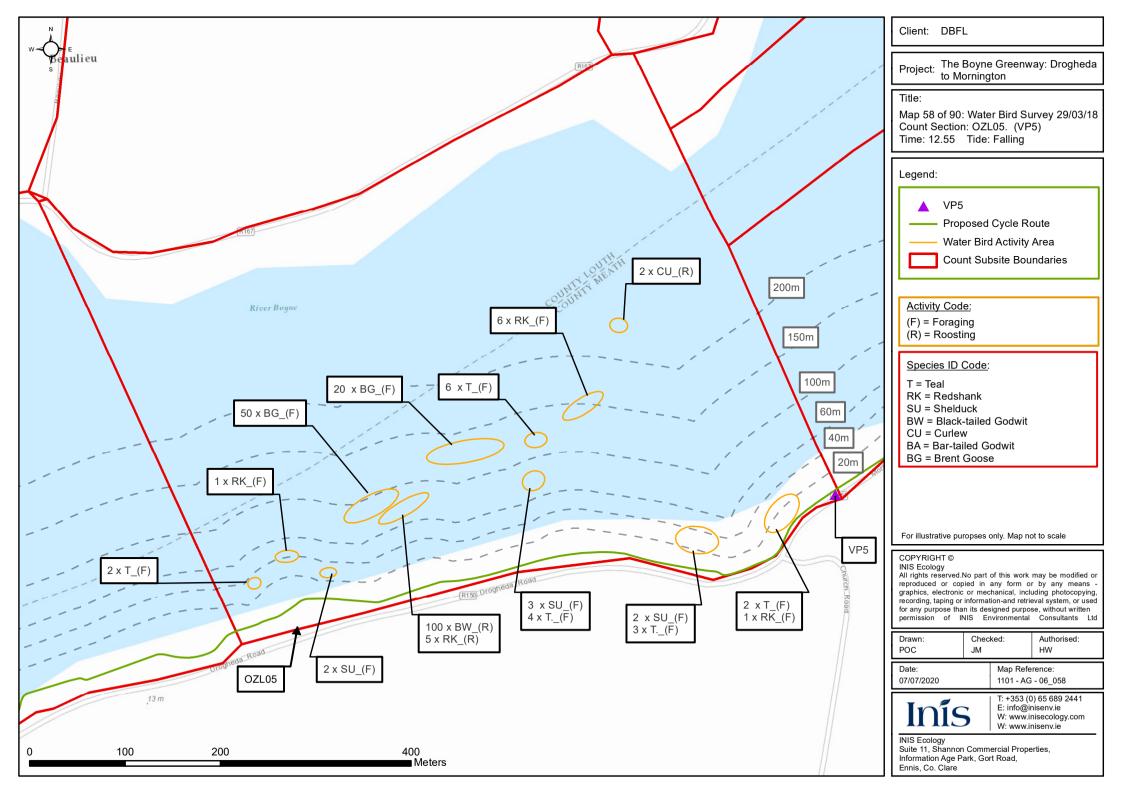


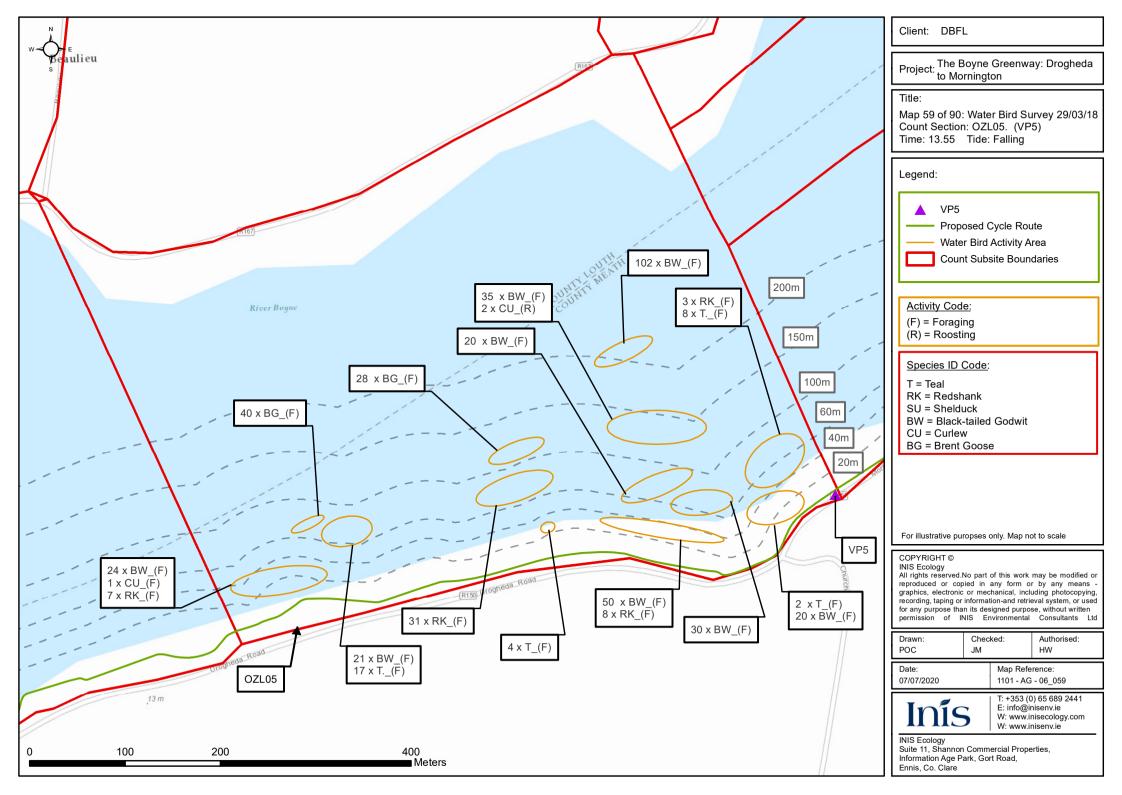


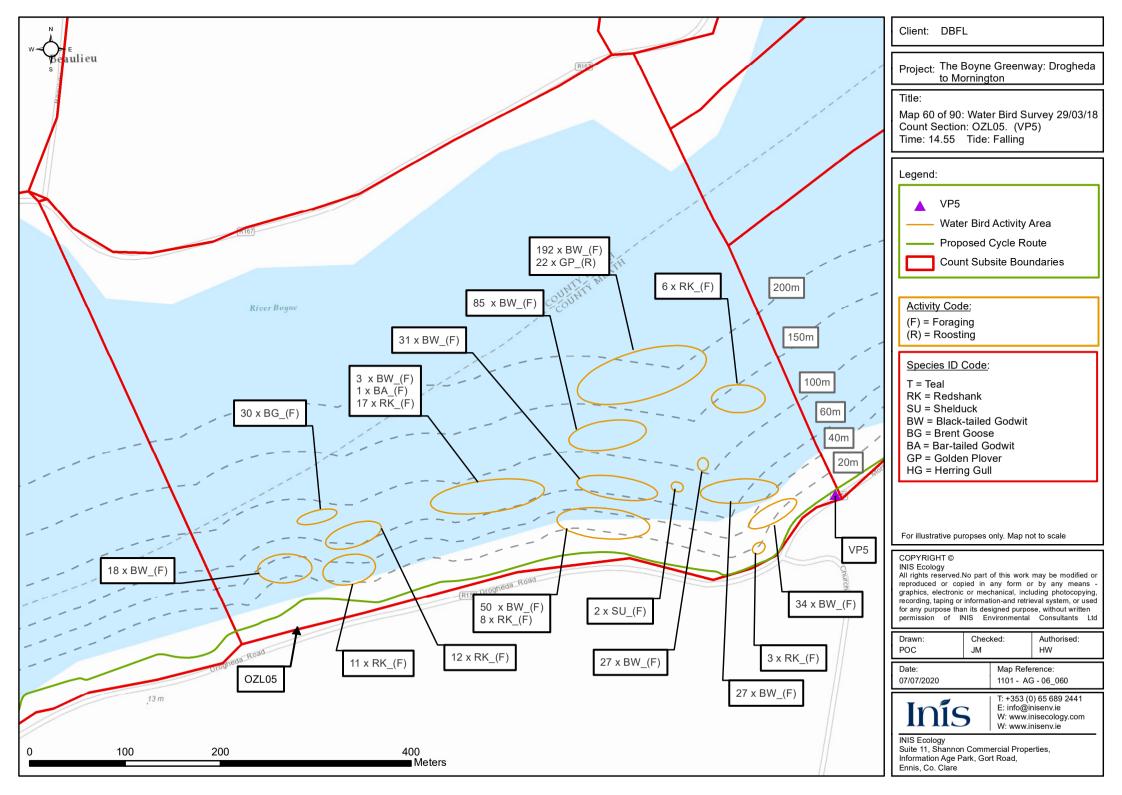


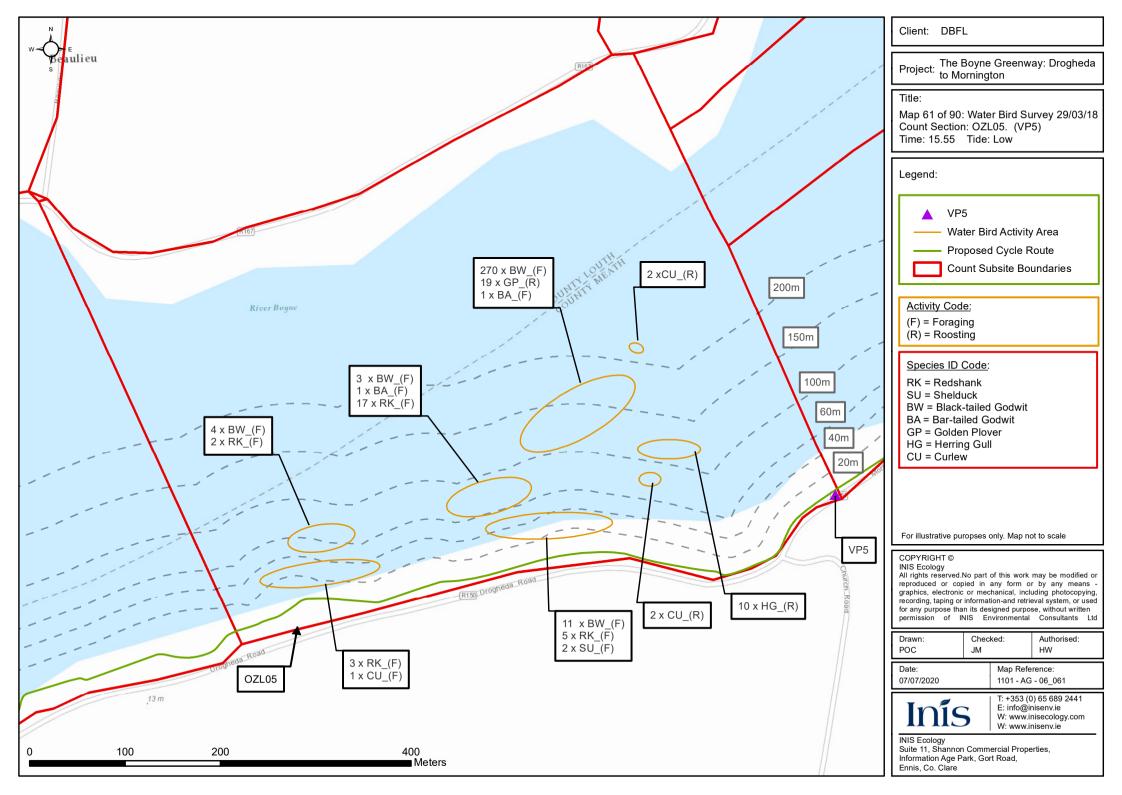


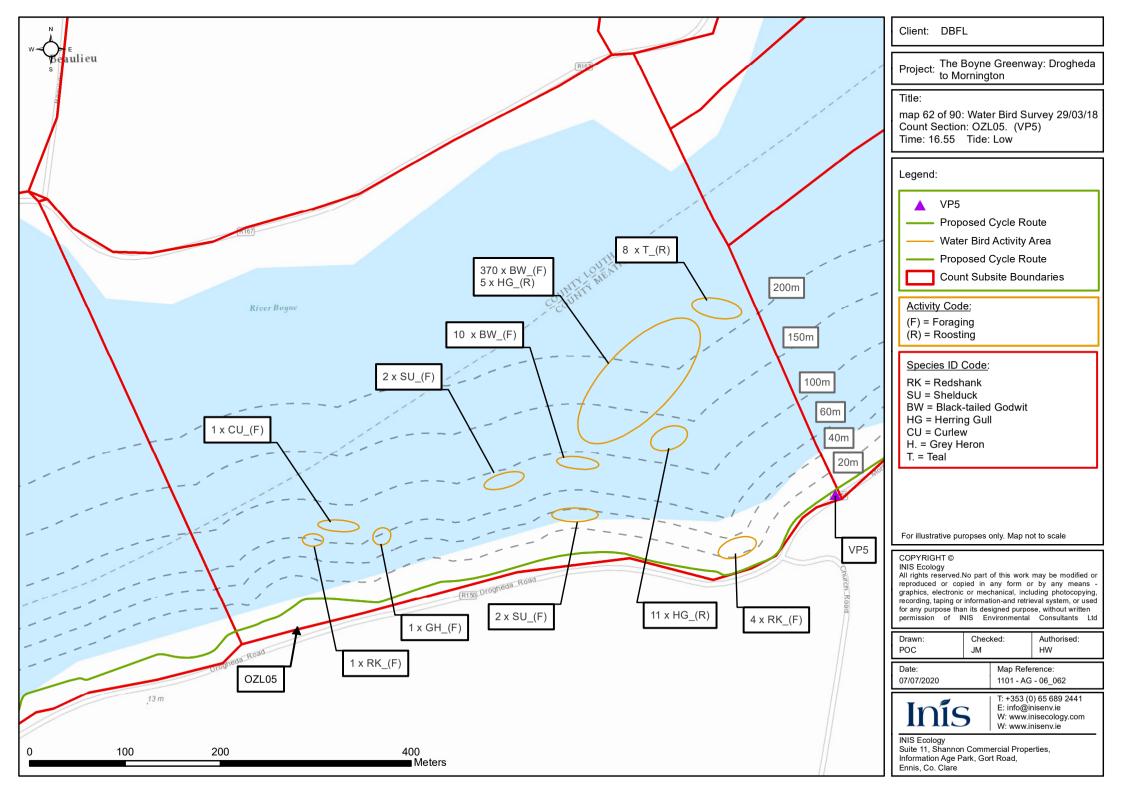


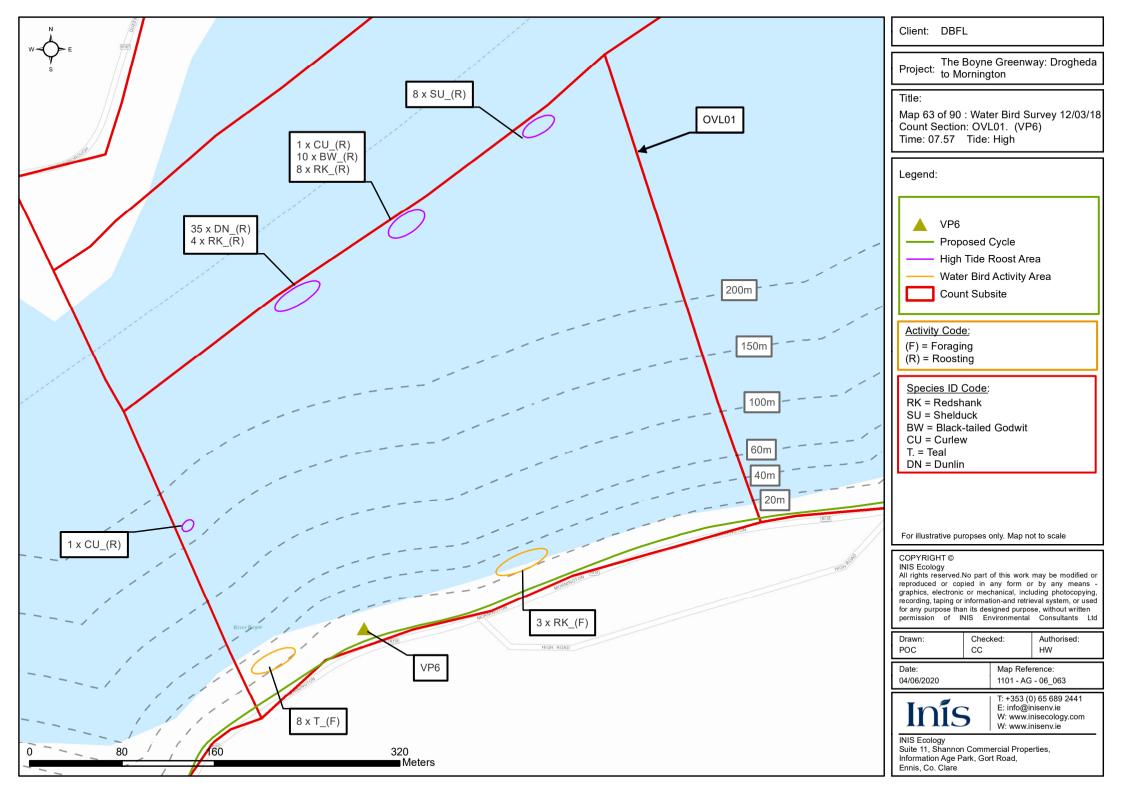


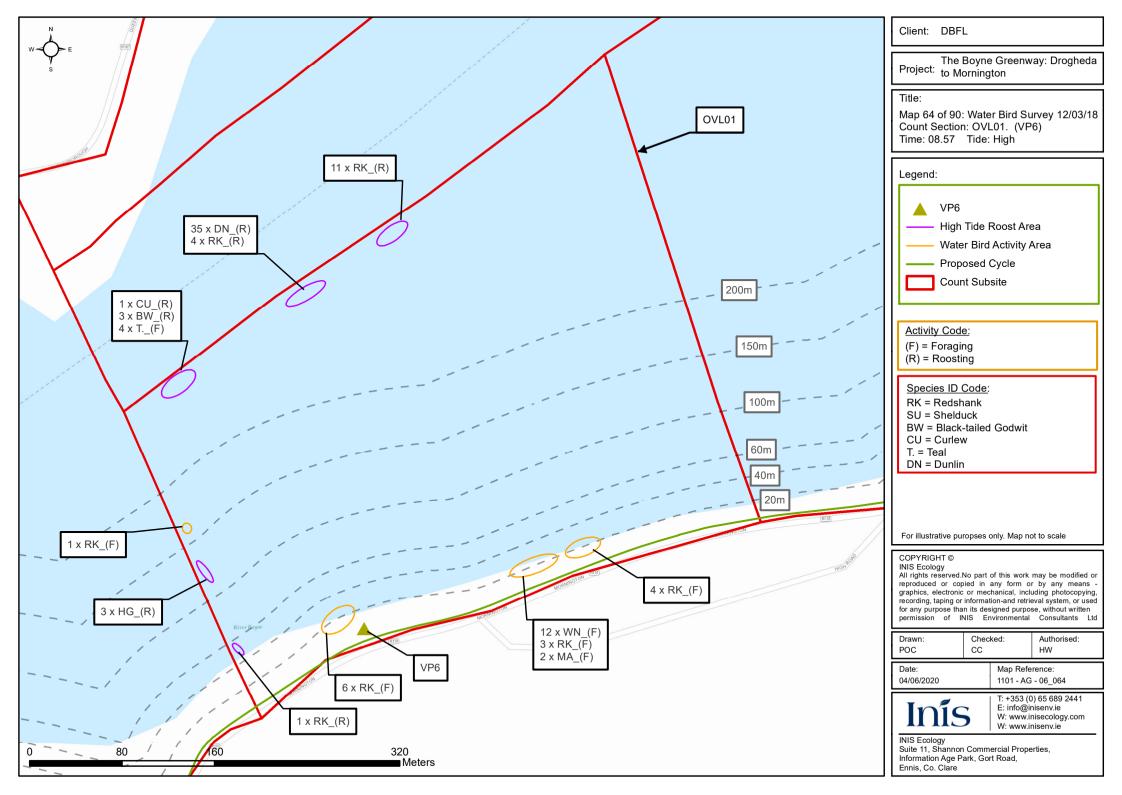


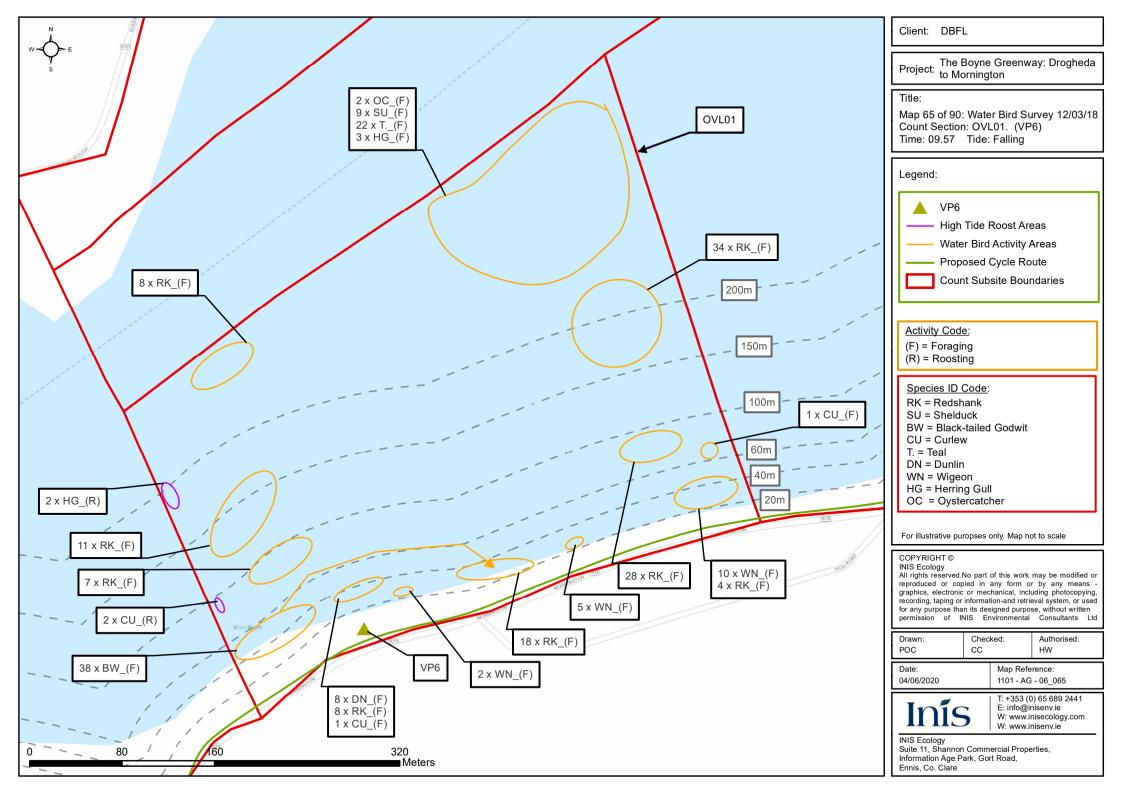


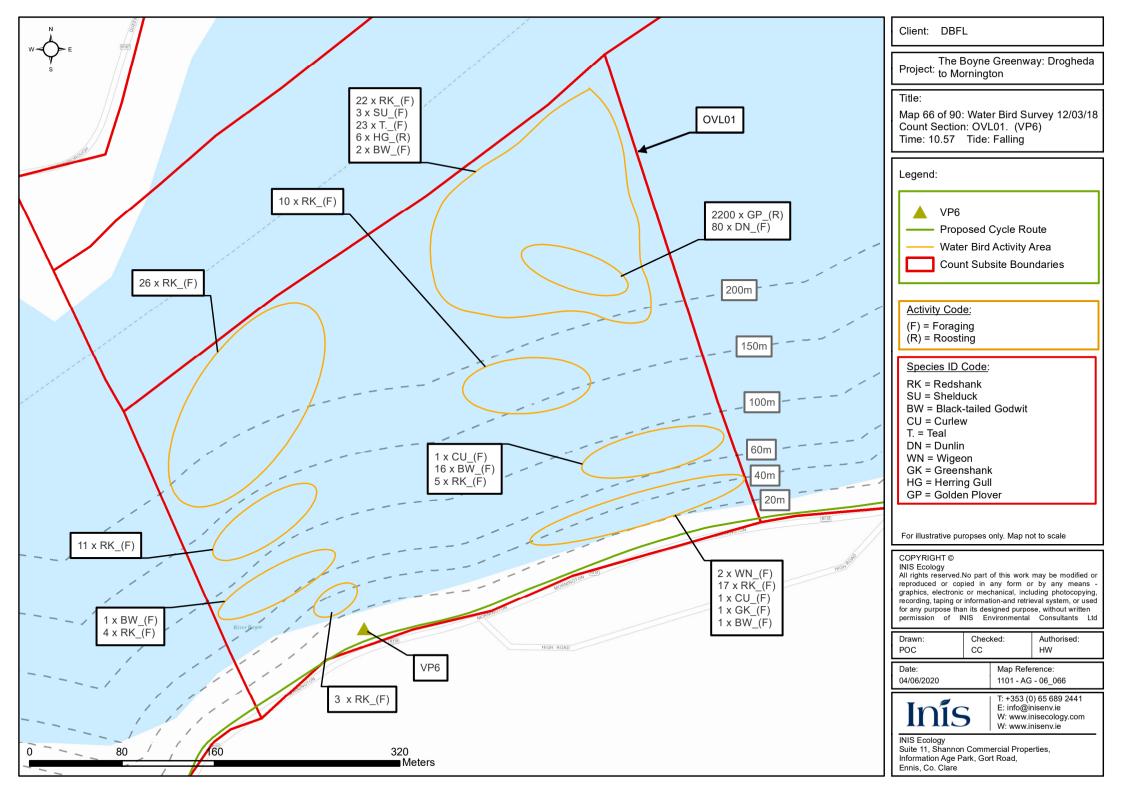


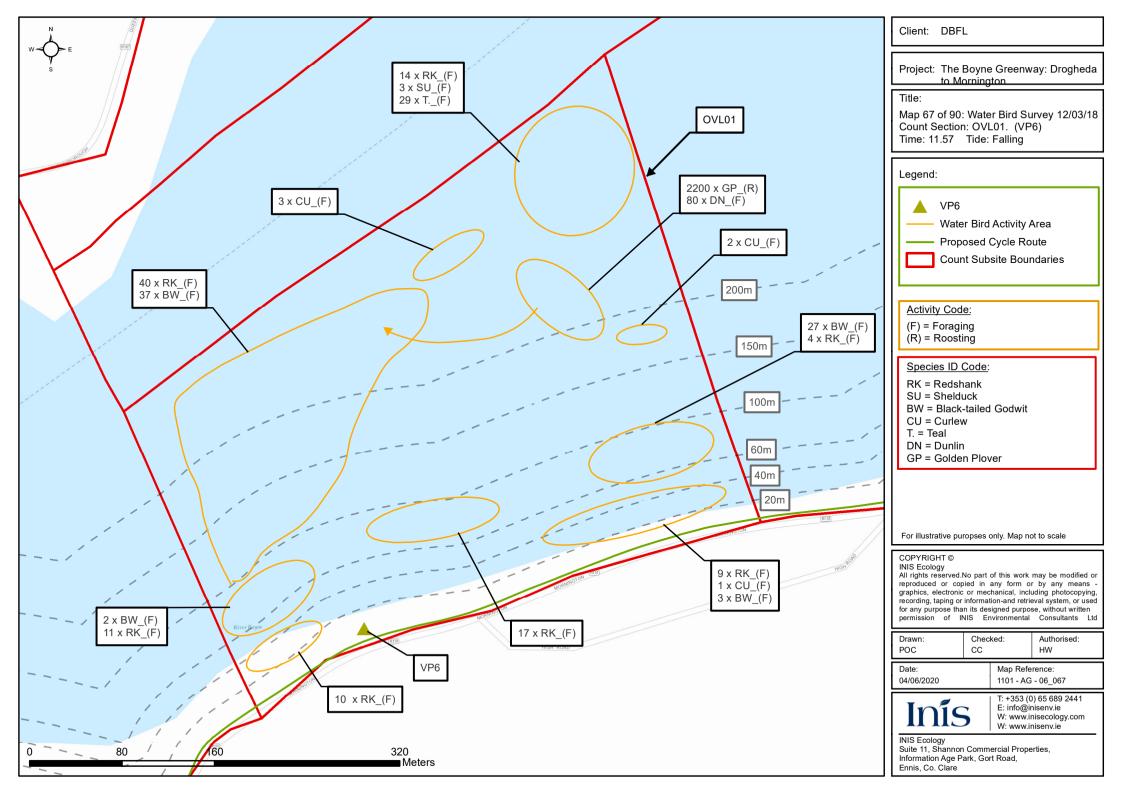


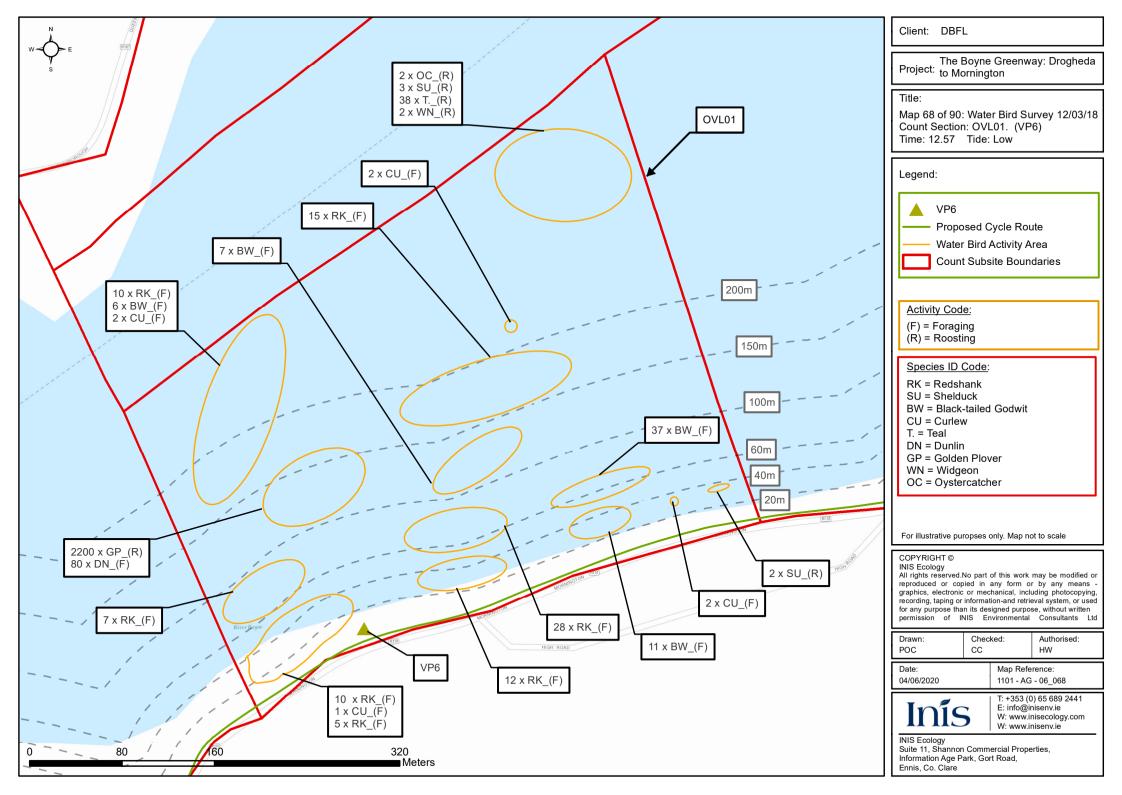


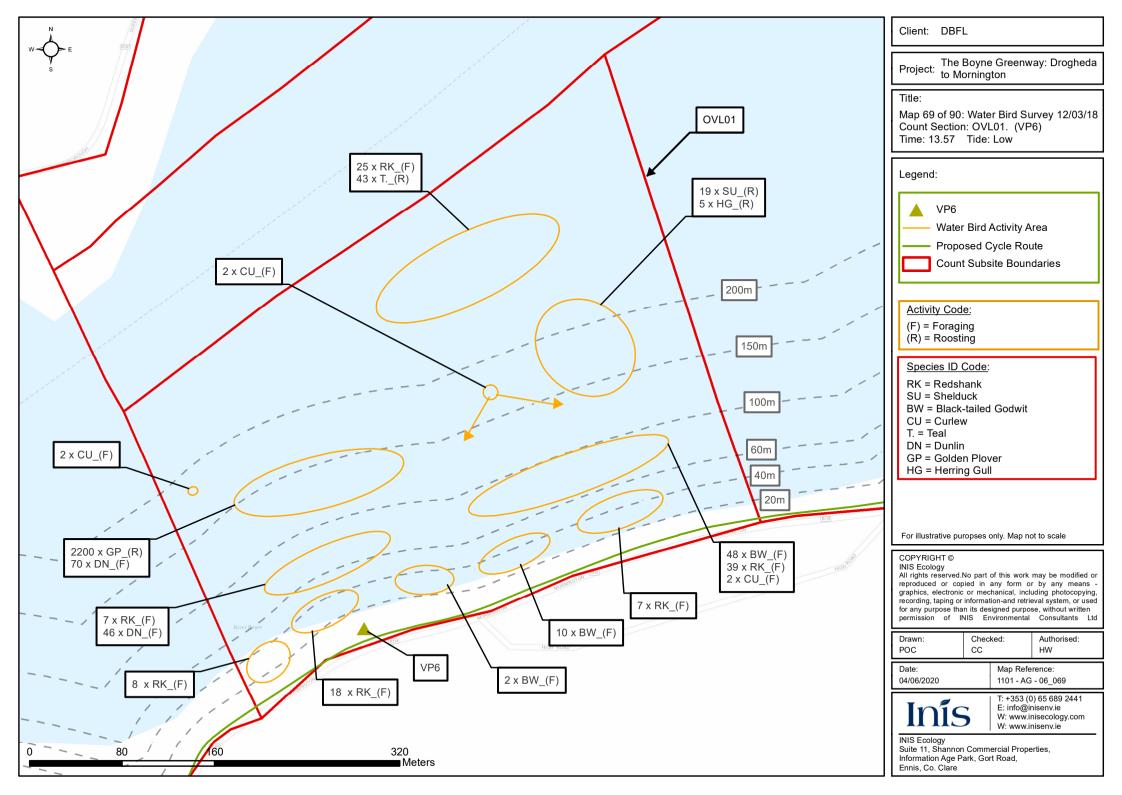


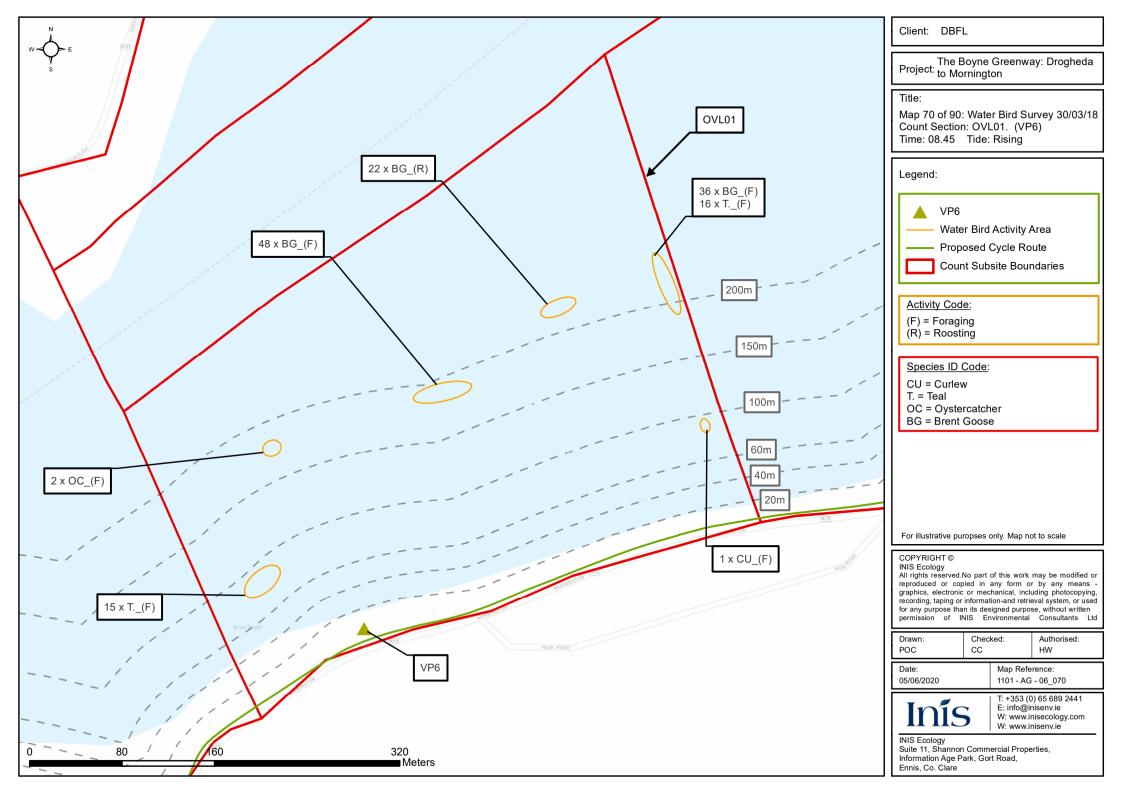


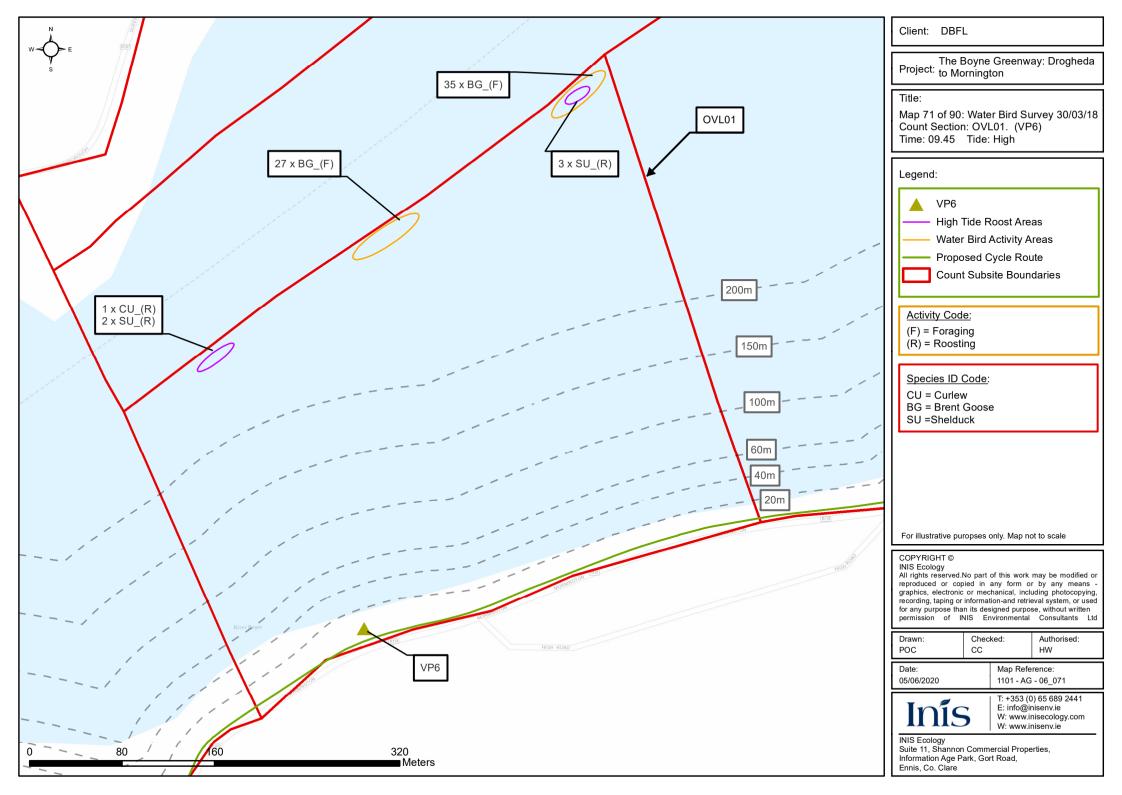


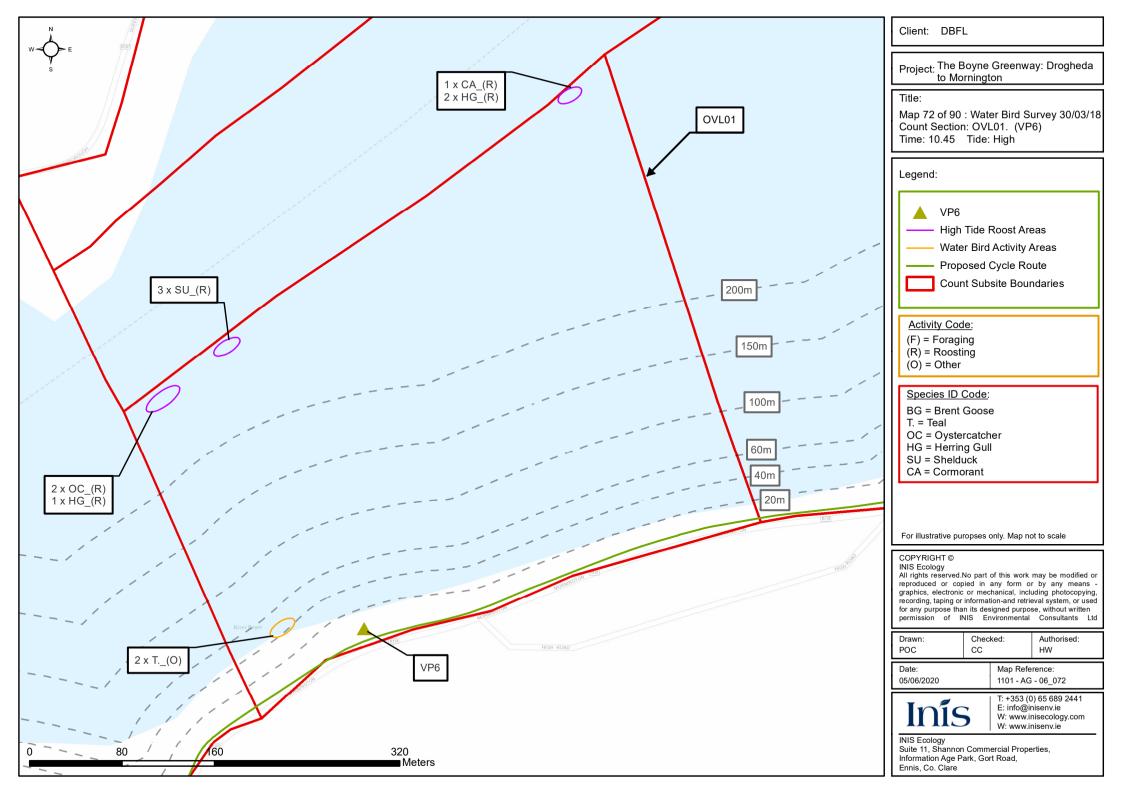


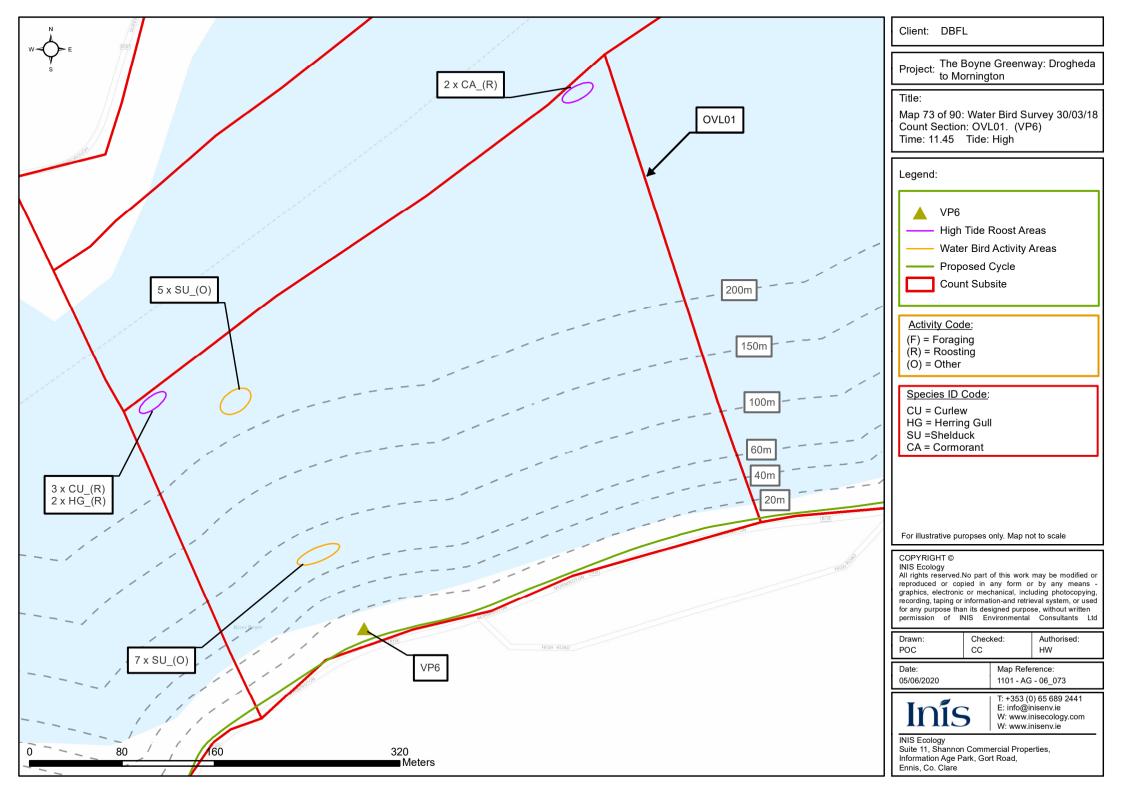


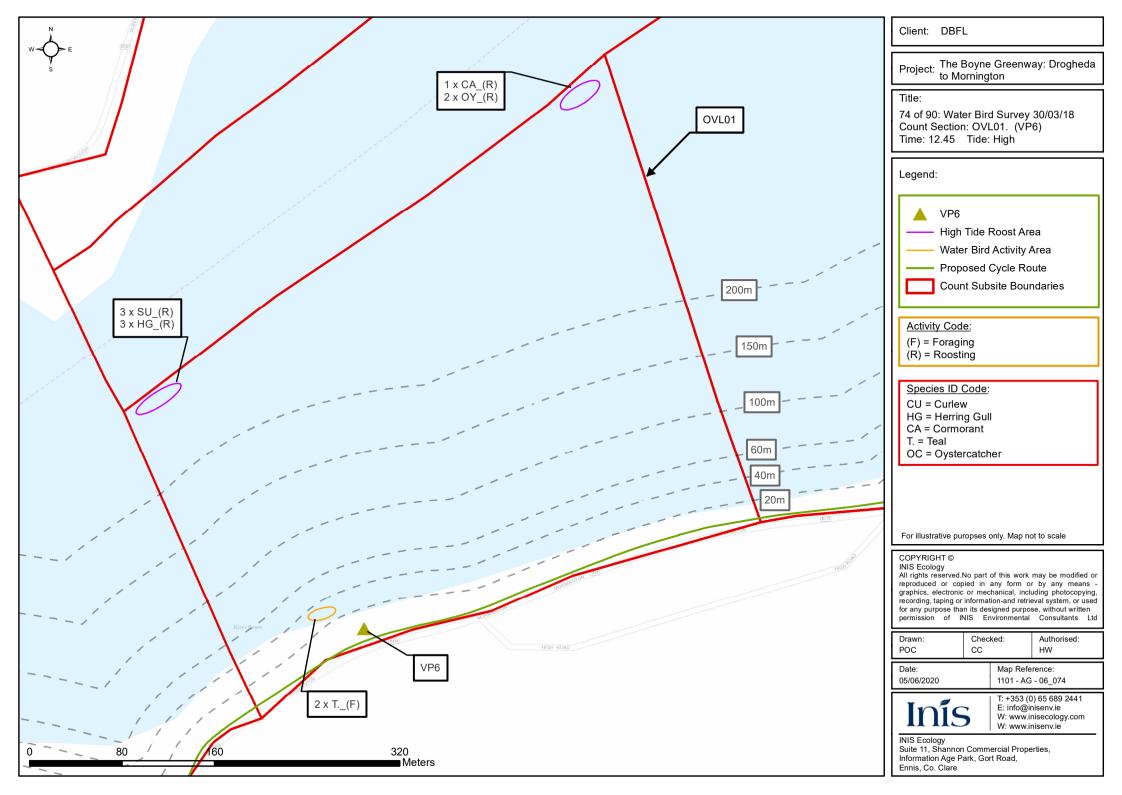


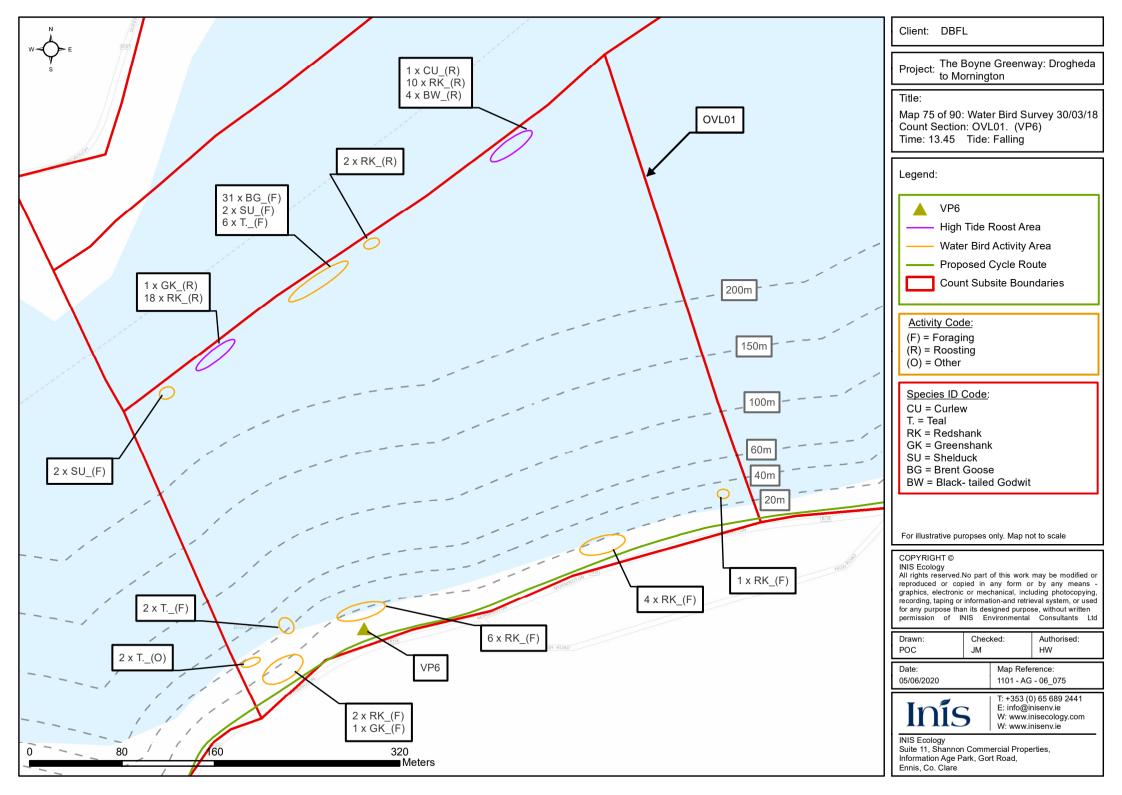


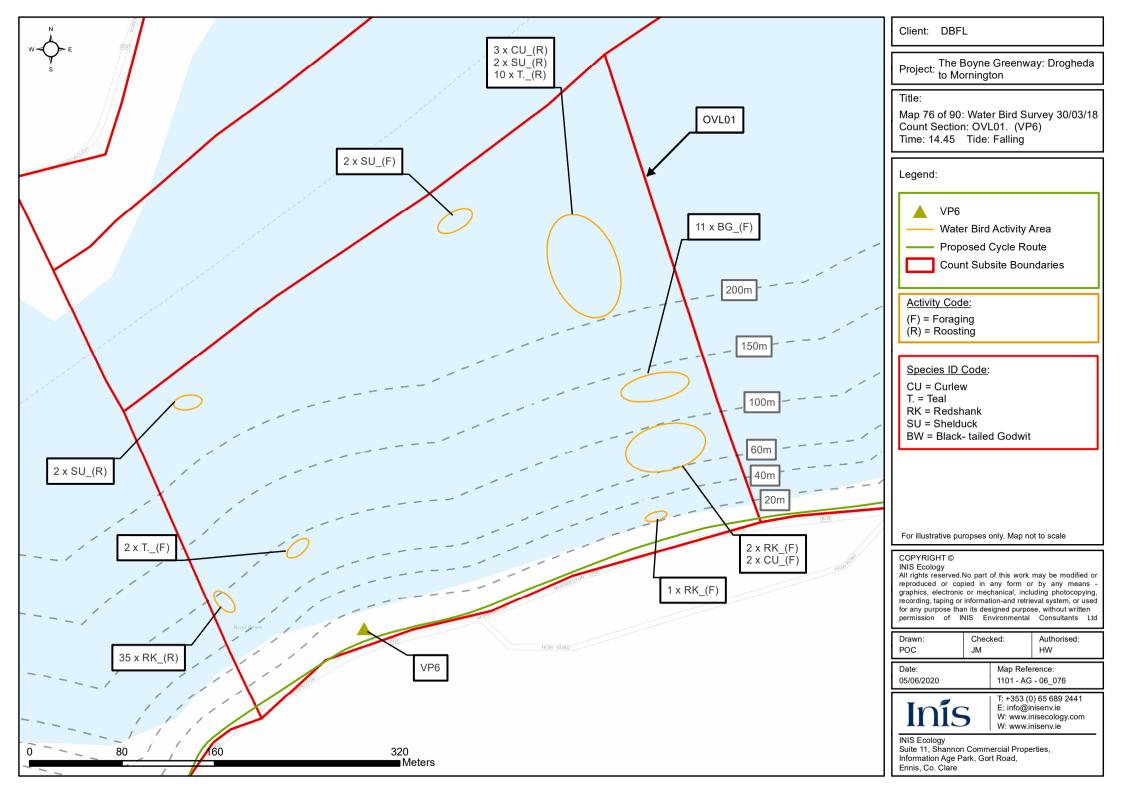


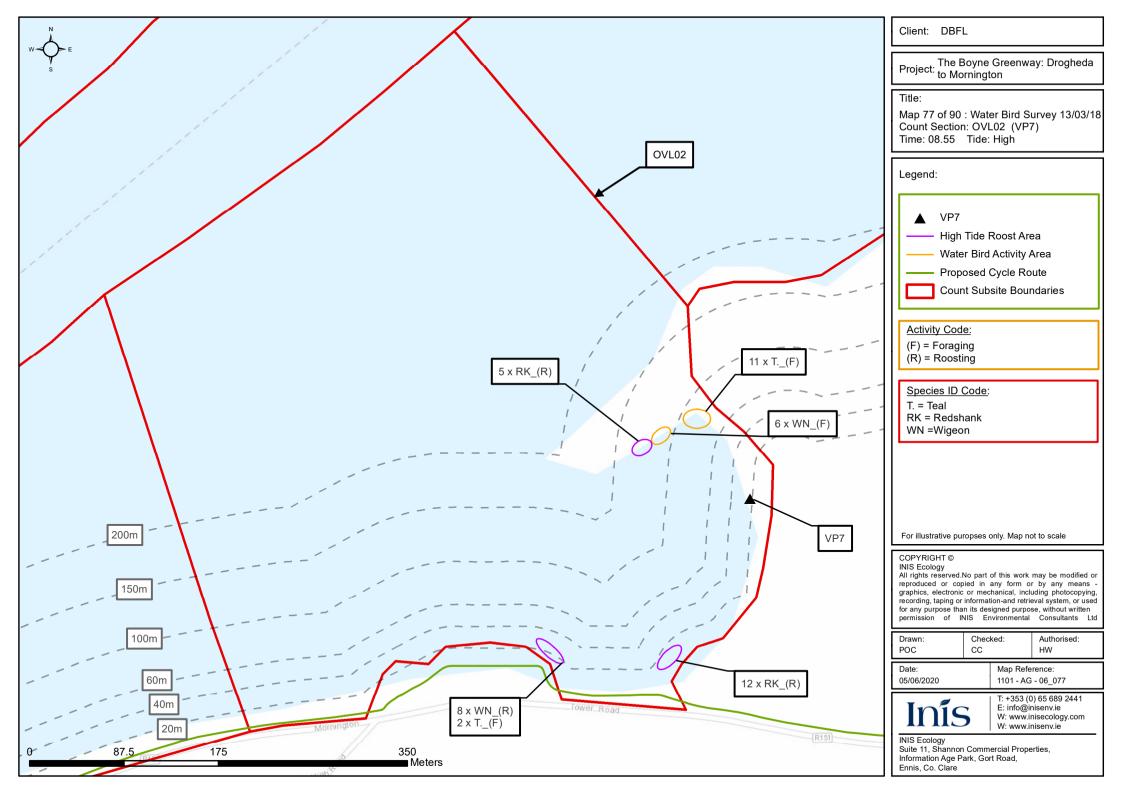


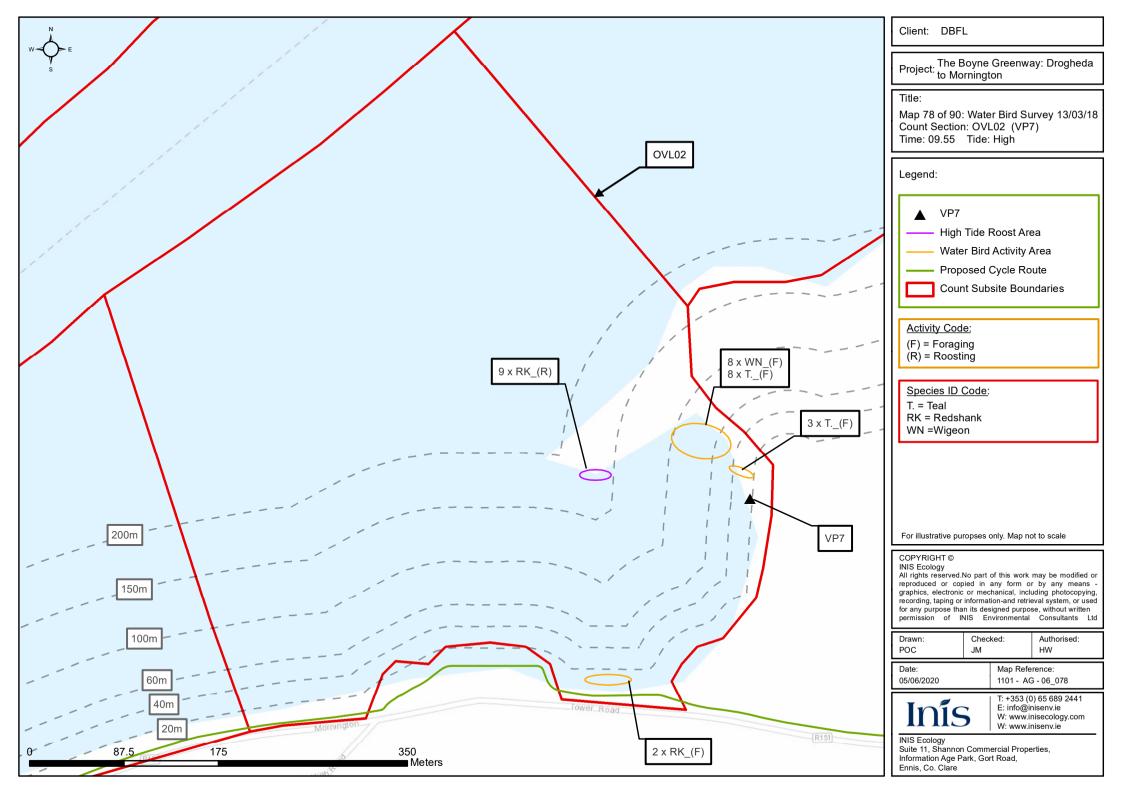


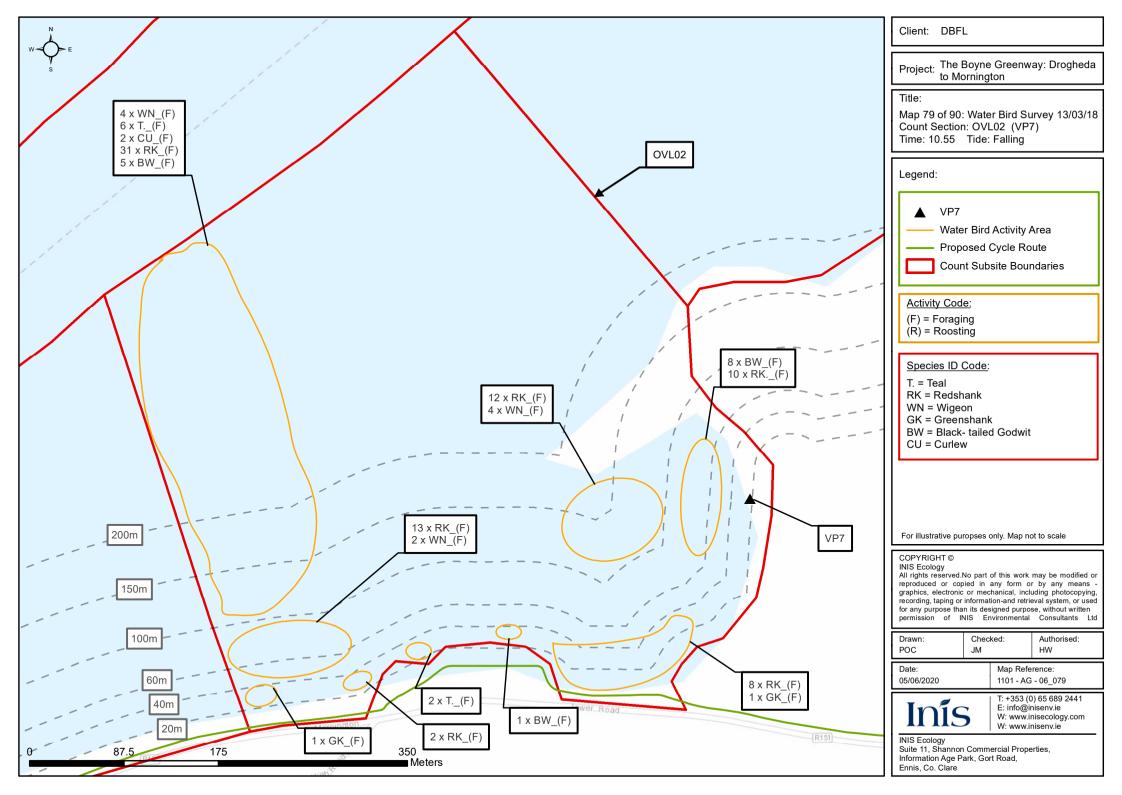


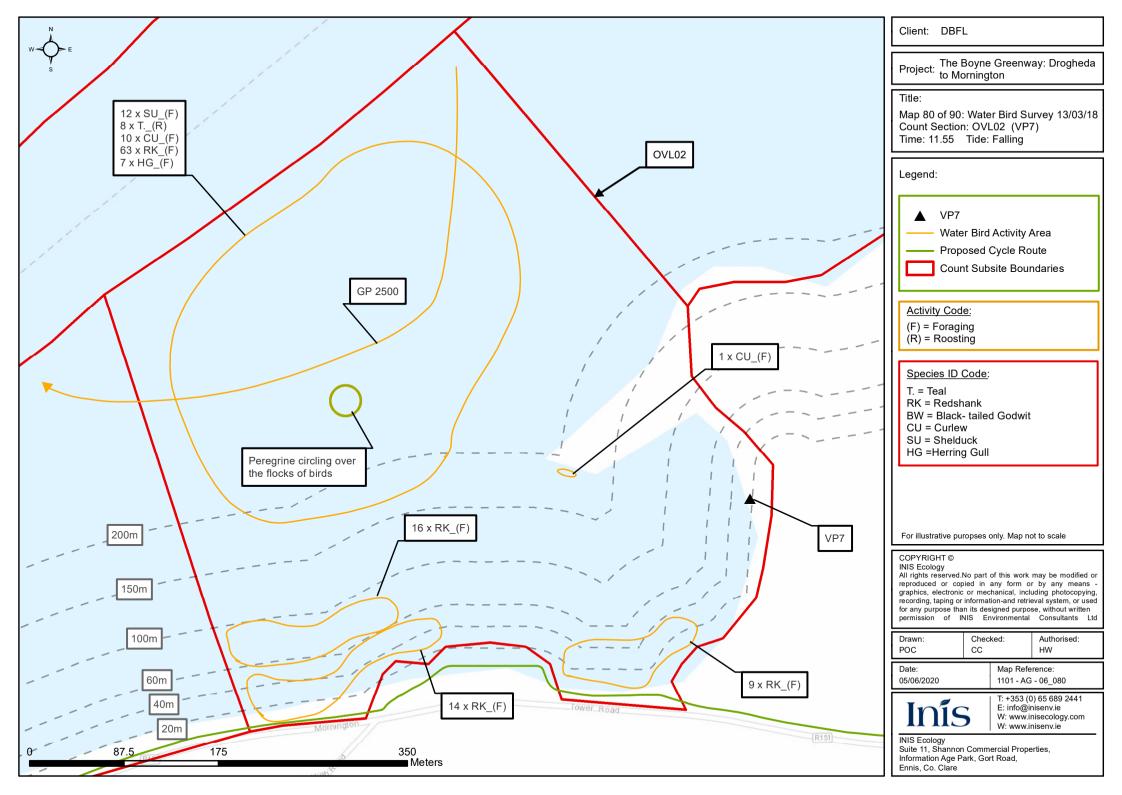


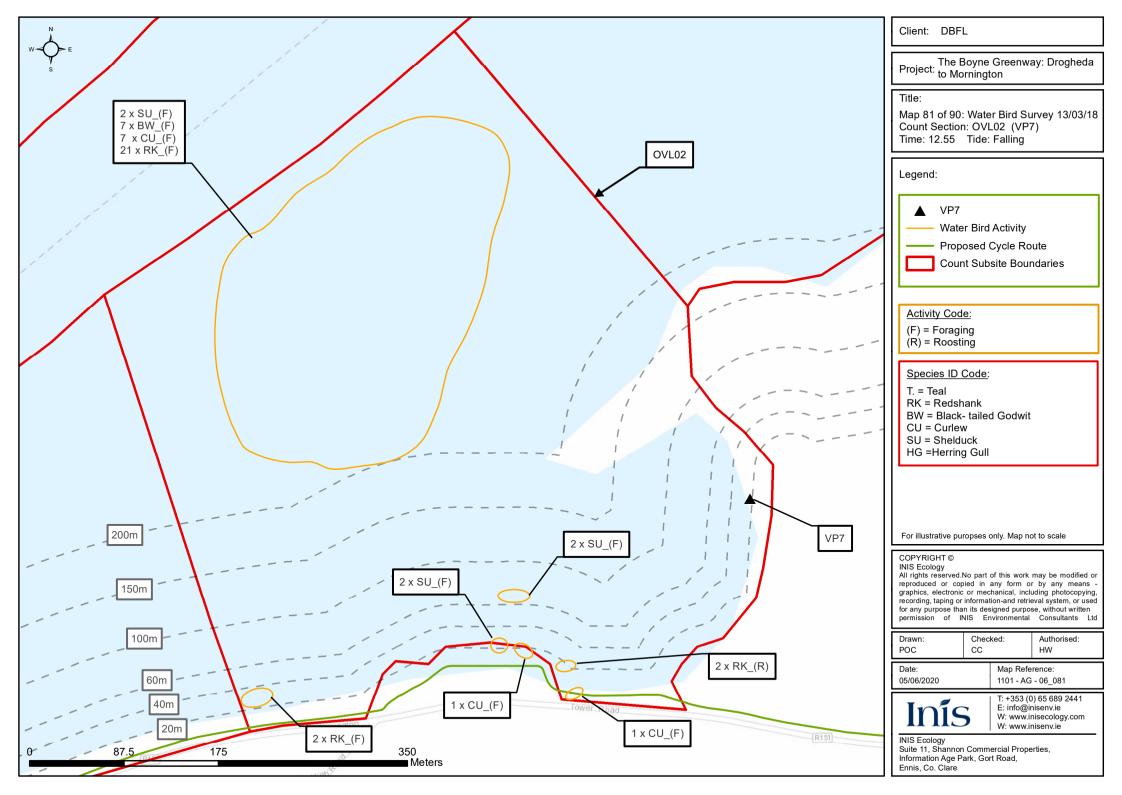


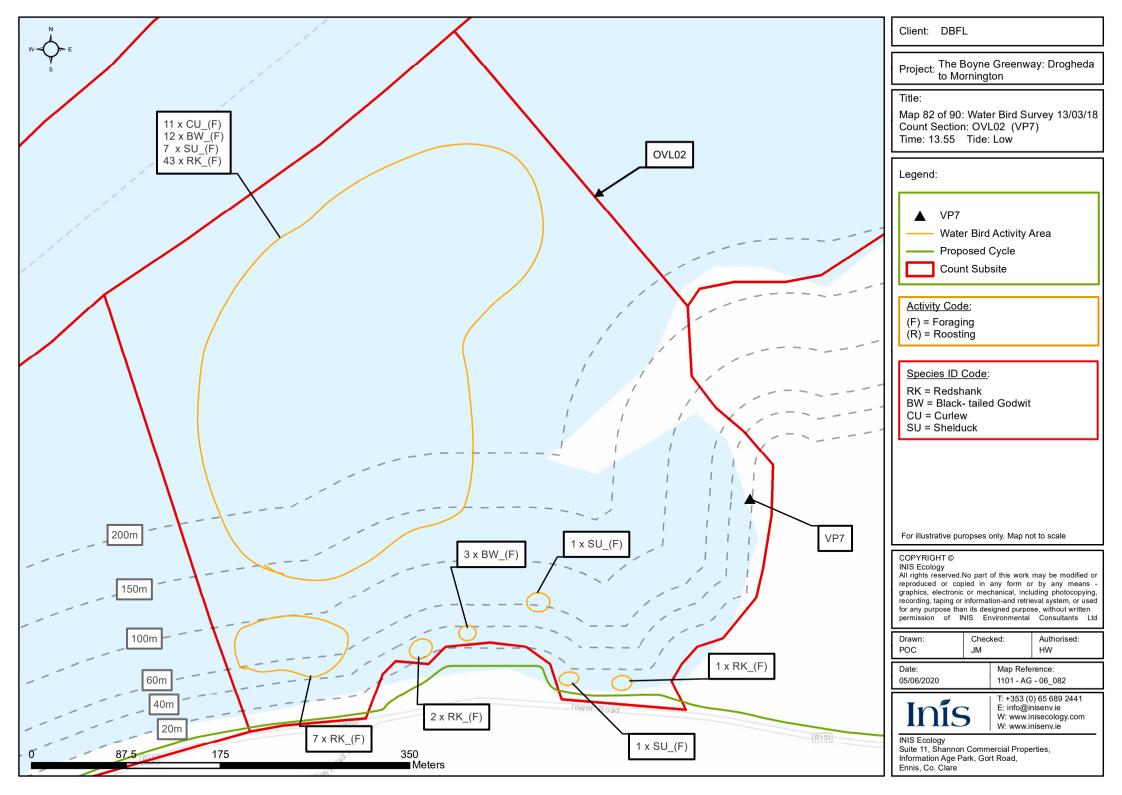


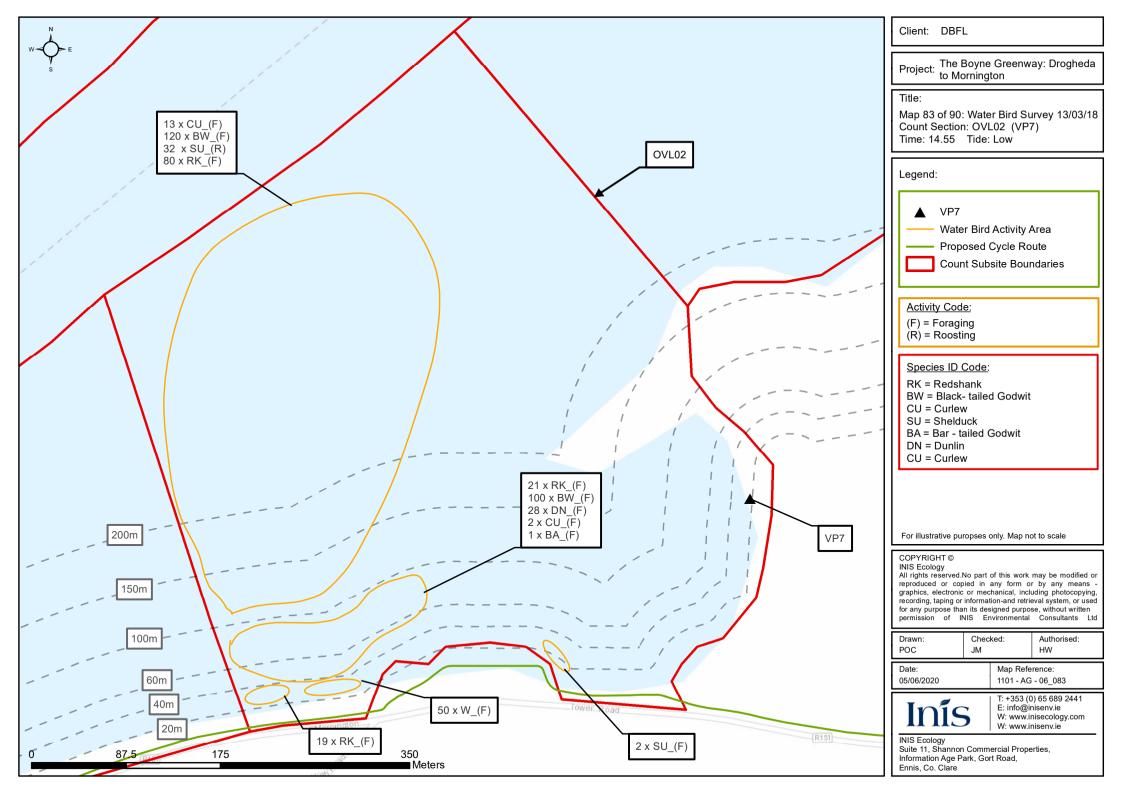


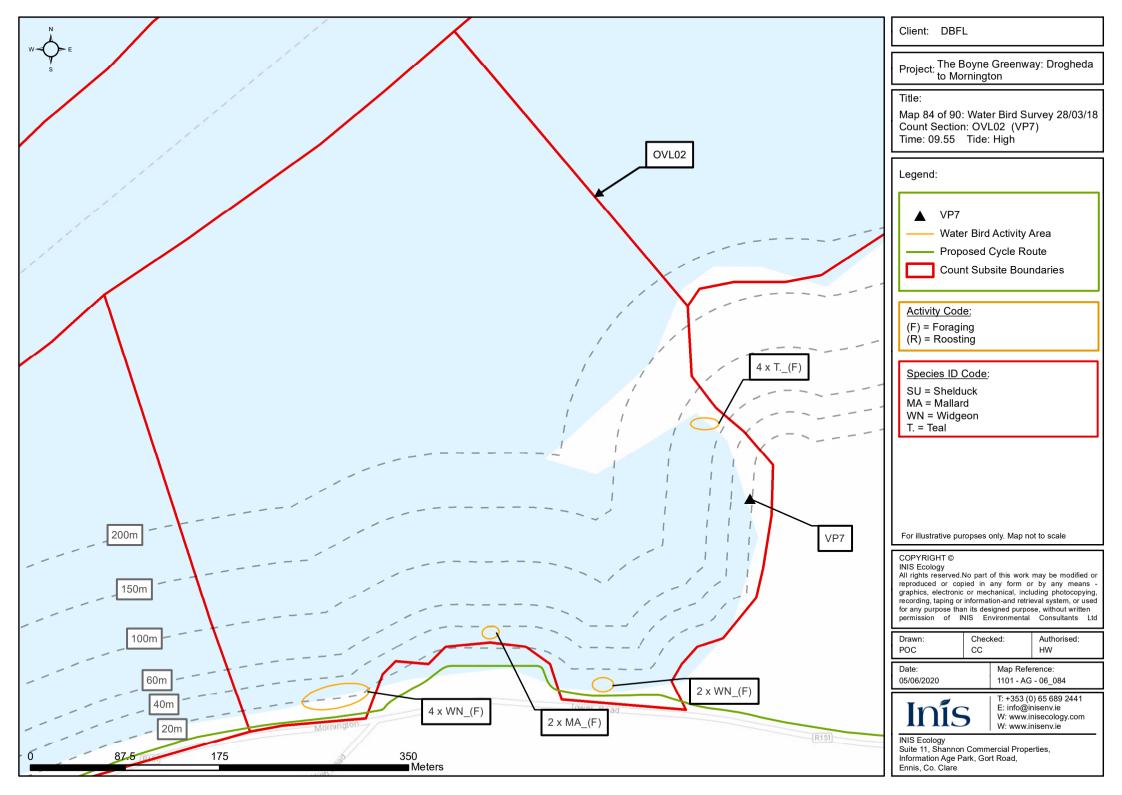


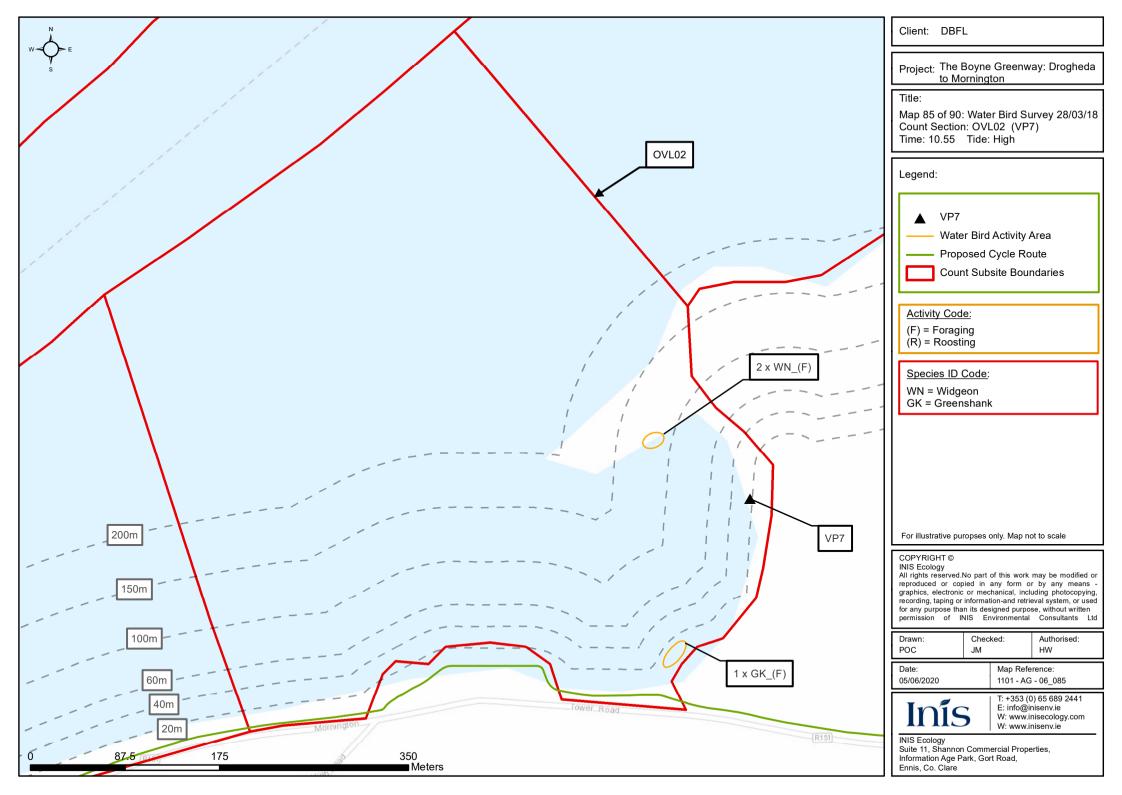


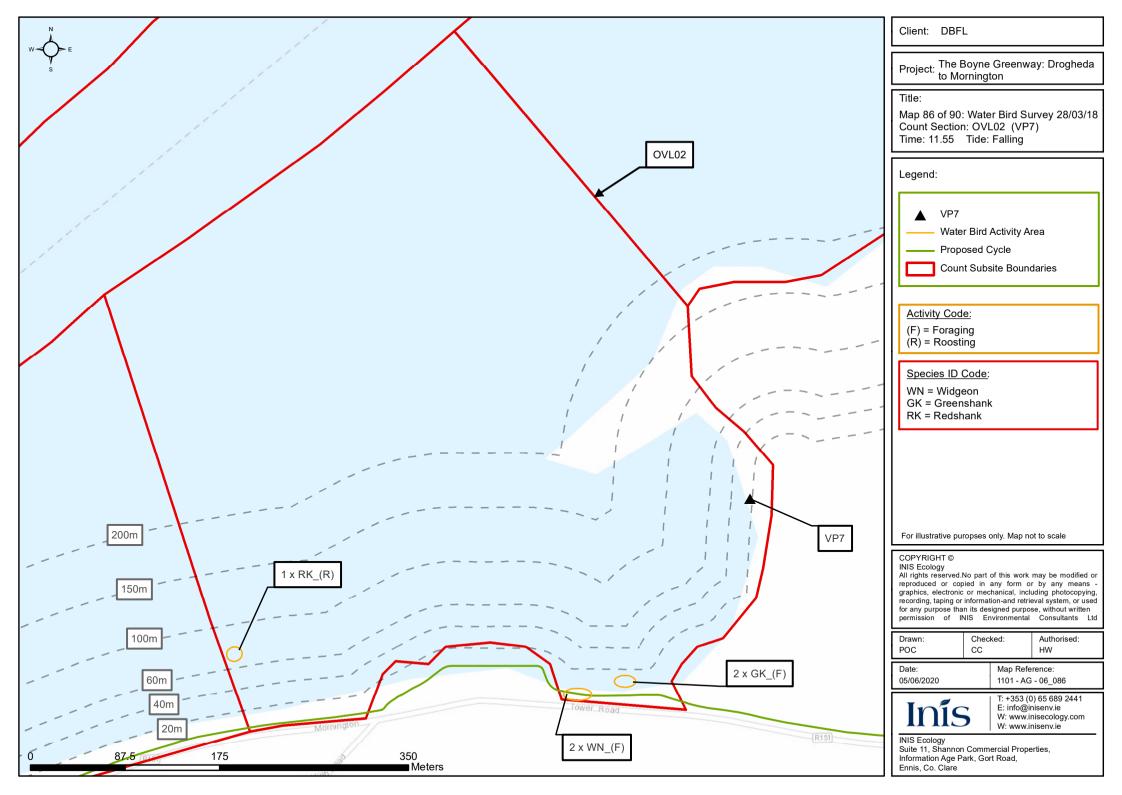


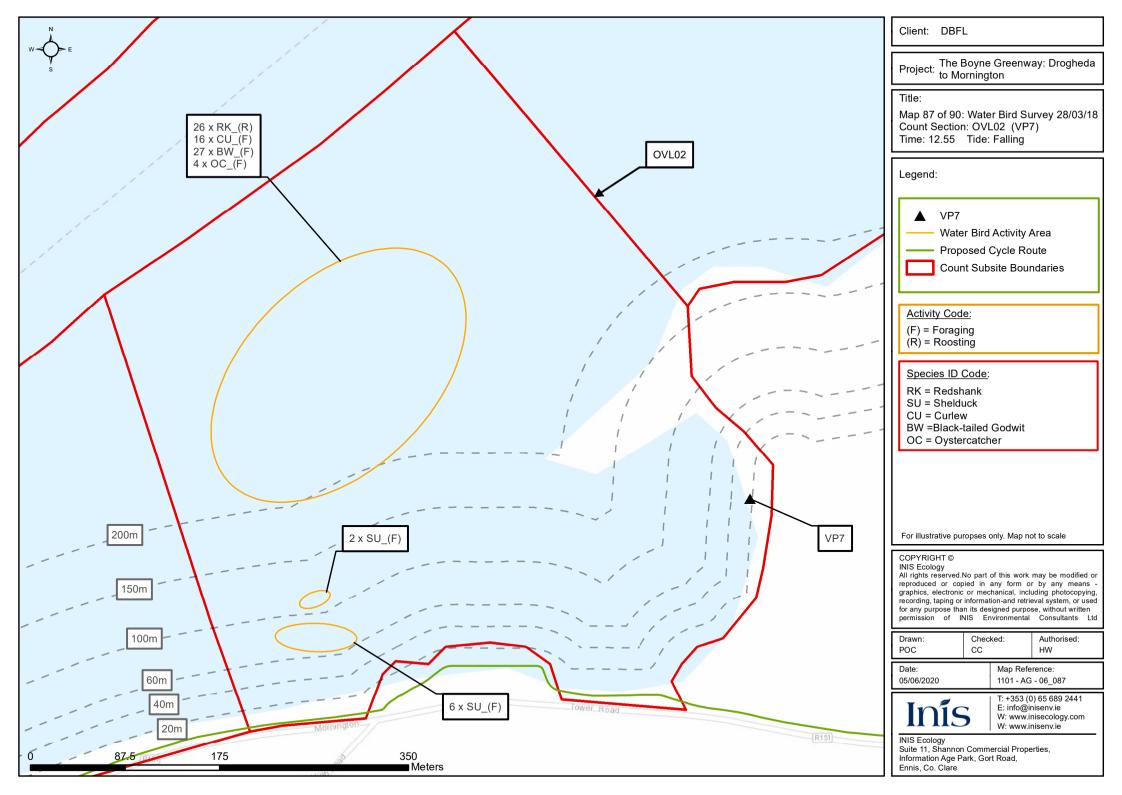


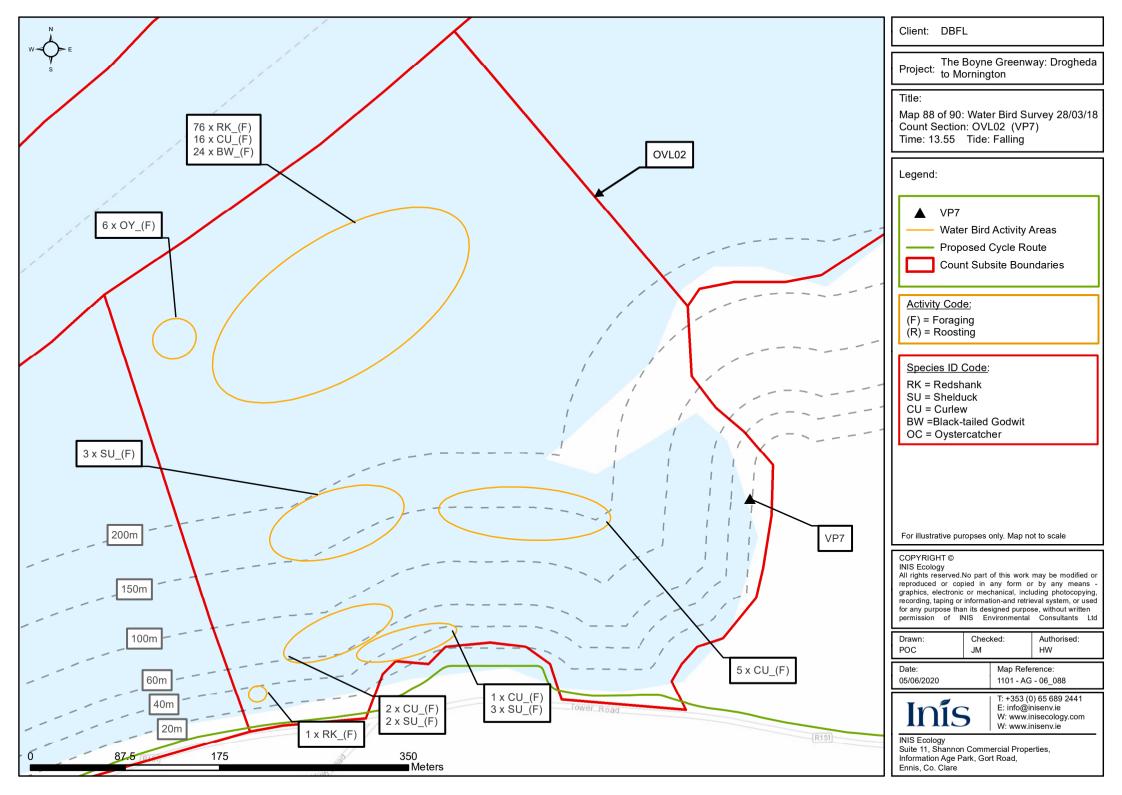


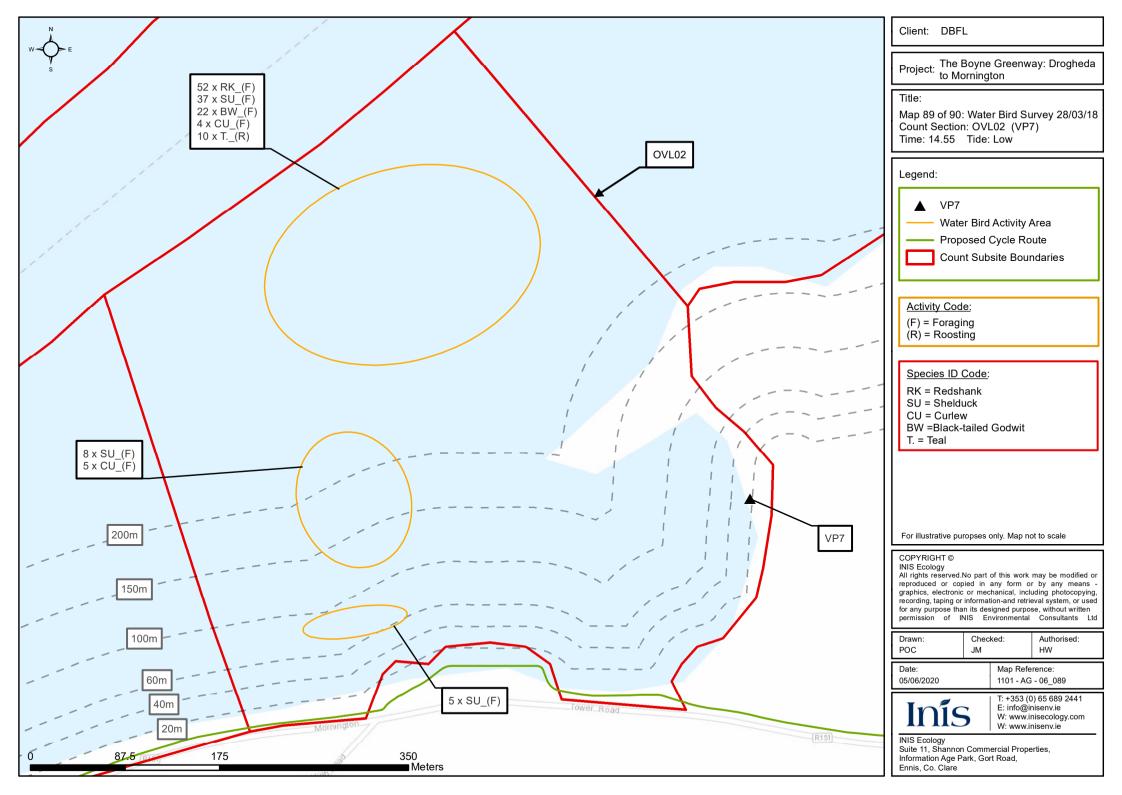












	Дp	pendix	B: 0	Consultation	Chronolog	gv and	Meeting	Minutes
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# Minutes of Meeting in Knocksink Wood Education Centre 27/9/18 between Inís Consultants, Meath County Council and NPWS to discuss the Boyne Greenway

Attendees: Cormac Ross (CR), Meath County Council (MCC)

Howard Williams (HW) and Chris Cullen (CC), Inís Environmental Consultants Linda Patton (LP), NPWS, Dept. Culture, Heritage and the Gaeltacht

## Background to project

The background to the project was discussed by Howard Williams, Chris Cullen and Cormac Ross. CR outlined the current project being put forward by MCC as comprising the Boyne Greenway from just before the viaduct in Drogheda out to Mornington. The very first section of the route is in Co. Louth, however CR outlined that an agreement will be in place between Louth Co. and MCC to allow MCC to progress the project through the planning process and construction phase.

The Boyneside Trails Group/MCC had previously commenced work on a route but this was designed with no cognisance of the special conservation interests or qualifying features of Natura sites.

Meath County Council, as advised by Inís Consultants following their appointment, have modified the original route extensively following scoping and a comprehensive constraints evaluation by Inis based on Best Practice surveys to be ecologically 'fit for purpose'. CC also noted a review had been undertaken of the precedent set in other European Sites on similar projects and referred to providing examples later.

By way of background CR/CC outlined some data from a greenway/cycleway in Co. Waterford, where a peak daily figure of 5000 cyclists/pedestrians was recorded (2017), with a daily average of approximately 1100.

### **Ecologists input – intrinsic design**

This was presented by Chris Cullen and Howard Williams.

CC/HW outlined the iterative approach undertaken from the initial scoping visit carried out by Inis in February 2018 through to the present date.

Key knowledge gaps identified in informing the optimum route iteration from an Ecological perspective were bird distribution during the winter months within adjacent estuarine areas, and the scale and nature of sensitive habitats along the route corridor.

The requirement to apply intrinsic design was also identified at an early stage in the project as the most robust approach in ensuring the avoidance of effects on Biodiversity.

As a route had already been chosen, ecological constraints were examined and the route was amended where necessary through multiple iterations in conjunction with MCC's appointed Engineering Design company (DBFL). The original route impacted on bird roosts and saltmarsh and proposed a bridge across the area known as 'the gut'. This was deemed unacceptable by Inis Environmental Consultants at an early stage and these locations are now wholly avoided.

Bird surveys to inform route selection followed the survey areas as per the conservation objectives sections for compatibility of data. Count sectors referred to were those available

from NPWS low tide counts previously conducted and which form part of the online supporting documentation to Conservation Objectives (Tierney et al. 2012), CC provided a map illustrating the count sectors.

CC noted this approach was intentional to allow for robust side by side comparison upon which to inform route selection options. CC explained that the methodology was the same in principle as the Low Tide survey programme however rather than single counts within a 2-hour window either side of the LT point, hourly counts across a 6-hour period of the tidal cycle (HT to LT, LT to HT, mid-ebb to mid-flood etc) were completed from fixed vantage points (VP's). All locations and activities of feeding roosting birds etc. was recorded in line with the Low Tide methodology. All roosts were identified and mapped on the hourly count coinciding with High Tide. Bird flocks/activity and roosts were georeferenced at 50 metre intervals extending from the Greenway. Bird surveys comprised 12 days in total.

CC provided some information on survey results such as a total of 28 species being recorded, with maximum densities of species such as Golden Plover (max 2600). Roosts were recorded intertidally, supra-tidally and terrestrially- many of these were ephemeral roosts of e.g. single birds. CC provided a sample map of results from one survey.

No significant bird populations are using the area adjacent to the greenway route however there are roosts within the distance bands out to 200m from it. CC noted that whilst obviously the more expansive count sectors where the estuary widens hold higher numbers of birds, the size of the uncovered intertidal areas at these points means birds may be at distances of >200m from the Greenway.

Mammals were surveyed using NRA and Highways Agency Best Practice methodology within a 50m buffer of the proposed greenway.

Trees were examined for bat suitability in line with Best Practice. Some trees are suitable at Drogheda Grammar School however these will be unaffected. CC noted the adherence to Best Practice in lighting etc to fully avoid effects on Bats and referred to later to be discussed intrinsic design.

No otter holts were found although otters are present throughout the estuary. CC pointed out on the map a location where some runs were found (near Flogas Ireland).

Vegetation was mapped using Fossitt classification and indicating annexed habitats. Invasive species included one plant of knotweed which was not on the route and there is sea buckthorn in the dunes. HW indicated that MCC have agreed that an Invasives Species Management Plan will be completed for the submission.

#### **Route design and final layout**

CC and HW then proceeded to run through an A1 map overview of the proposed route which outlined by colour, the differing construction methods proposed and the inherent design elements applicable to Biodiversity.

There will be no lighting during operation of sensitive sections adjacent to intertidal birds. Away from sensitive intertidal areas, lighting if required during operation will be motion sensor activated, and LED in nature (to avoid effects on Bats and Birds). Increased reflective barriers at entry and egress points will be a matter of course.

No compounds are required; only existing municipal compounds will be used during construction.

There will be an ECoW with the power to stop the works employed for the full duration of the construction period. The ECoW will be experienced in assessing bird behaviour and will monitor the construction to ensure that all intrinsic design features are applied correctly.

Construction will be during daylight hours only and will have camouflage hoarding during the wintering bird season where necessary. No works will be carried out at the inlet or any sensitive intertidal areas during the wintering bird season (October to March inclusive).

Educational information will also be part of the project to tell of the importance of the site.

Most of the route will be beside the road and will be a tarmac surface and will be screened by a waist high hedge of native species to enhance Biodiversity.

In Mornington Dunes the route will be on the existing track and will have wooden boardwalk maps. Signage will indicate restricted access. The boardwalk here will be cut to match the exact size of the existing track.

Other off-road parts will have a recycled plastic boardwalk. Boardwalk will have a waist high screening board made of the same material (minimum height 600mm) to avoid noise transfer from e.g. dogs and disturbance pathways to birds.

Some research was also done of greenways in similar locations, within Natura sites in other countries. CC ran through some examples such as on Schierlonnikoog Island within the Waddenzee SPA, Terschelling Island within the Waddenzee SPA, Het Zwin SPA in the Netherlands and the River Po delta SPA where in all instance's greenways run through or immediately adjacent to designated areas for wildfowl. LP commented on the availability of data on the effects, if any, of these greenways. CC noted this.

In one part, where there is proximity to an inlet, there is no room to have the route beside the road so it will go the other side of the wall. It will be a boardwalk on stilts within the mudflats (this will also apply to any other similar location where the adjacent grass verge is non-existent and/or the boardwalk is required to go on the outer side of the roadside wall). Linda Patton was of the view this was the part most likely to result in the project screening in for AA, it will result in a potential impact on a small part of the wetlands habitat used by birds however it was explained that large aggregations of birds do not use this part of the estuary, in close proximity. She advised looking at the issue of a boardwalk, shading and birds in the S 2 S EIS and accompanying documents that was submitted to ABP. The possibility of removing infill to allow for the creation of more wetlands was also discussed as an intrinsic design measure to offset any potential loss of mudflat habitat. This offset should be greater than the potential habitat loss to affect a net gain on the SPA. HW acknowledged this, as did CR.

There was a discussion about court judgements and mitigation (i.e. Recent case law such as *People over Wind*) and whether effective loss of habitat was deemed significant. Habituation was brought up by HW and discussed briefly.

CC noted that the rationale for stilts was to allow light penetration thus not excluding birds from potential foraging areas. Disturbance effects are considered to be brief if at all given the existing source of disturbance from on-road traffic. CC also noted some of the existing disturbance sources recorded during surveys such as water vessels on the river.

There was also a discussion about a proposal to have some marram planting at habitat damaged areas at Mornington beach which Meath County Council are happy to progress as part of the project. This is an added measure to provide habitat over and above any effects from the development.

The need for an outline construction management plan to allow for a complete assessment was also discussed. This was acknowledged by CR/CC as a matter of course.

It was agreed that Linda Patton would send a standard scoping response to EcIA following the meeting.

## 'During' and 'Post Construction' monitoring

There will be three years post construction monitoring to ensure measure the efficacy of all measures employed. A report of the findings will be submitted to NPWS at the end of this term.

CC outlined that there is a precedent for this project in the Irish context from e.g. a Greenway/Cycleway project in Wexford. This will be an important element in supporting the efficacy of the intrinsic design of the project in avoiding effects on any European Sites.

## **Proposed reporting**

Reporting was discussed during the early portion of the meeting when the likely Part 8 application was brought up. In response to CC outlining the consideration of the iterative process that had gone into a final intrinsic design, LP queried whether Appropriate Assessment Screening would be the level of Appropriate Assessment reporting undertaken. CC acknowledged that this was currently under consideration given the intrinsic design.

During the discussion on case law CC outlined a recent case in the UK (R (Langton) v Secretary of State for Environment) wherein the judge found that integral features within a scheme can be considered at Screening (i.e. Stage 1) of the Appropriate Assessment process.

# Final Minutes: Meeting on the Proposed Boyne Greenway

<u>Location:</u> Department of Culture, Heritage and the Gaeltacht (DCHG), 90 North King Street, Smithfield, Dublin 7, D07 N7CV. Room 2.26

**Date and Time:** 18 December 2019, 2.00pm – 3.30pm

#### Attendees:

Name:	Initials:	Role/Organisation:	
Gerry Clabby	GC	Head of Ecological Assessment – NPWS	
Annette Lynch	AL	Divisional Ecologist – NPWS	
Kelly Muldoon	KM	Ecological Assessment Unit – NPWS	
Nicholas Whyatt	NW	Senior Engineer – Meath County Council	
Cormac Ross	CR	Resident Engineer – Meath County Council	
Howard Williams	HW	Ecologist – Inis Environmental Consultants	
Chris Cullen	CC	Ecologist – Inis Environmental Consultants	
Frank Magee	FM	Senior Executive Engineer – Louth County Council	
Brendan McSherry	BMcS	Heritage Officer – Louth County Council	
Bill Bates	ВВ	Director – DBFL Consulting Engineers	

#### Minutes:

- 1. Welcome and Introductions: GC welcomed all attending and introductions followed.
- 2. Project Overview: Inis Environmental Consultants briefly outlined the proposed scheme. Meath County Council has recently conducted a non-statutory consultation on the proposed route to invite comments from the public prior to submitting a planning application to An Bord Pleanála (ABP). GC explained that NPWS had requested an opportunity to review the scheme as part of this consultation process as representations had been made to the Department concerning the scheme. GC thanked Meath County Council for their cooperation in this matter and for attending the meeting on foot of the concerns highlighted in the Department's observations dated 13 December 2019. NPWS highlighted its support for the provision of greenways but pointed out that the Department has a duty, as a statutory consultee in the planning code and the lead Department with regard to nature conservation, to highlight nature conservation concerns when they arise. In addition, all public authorities have a duty to ensure in carrying out their functions that the objectives of the Habitats and Birds Directives are met as set out in Regulation 27 of the EC (Birds and Natural Habitats) Regulations, 2011.
- 3. **DCHG observations in relation to the proposal:** GC highlighted that the Department is solely concerned with nature conservation issues which may arise from the proposed greenway, in

the context of its role as a statutory consultee in the planning code. The Department's observations are aimed at ensuring that the project is delivered in a way which minimises impacts to nature conservation interests. GC mentioned potential impacts at construction and operational phases, including the potential impacts of bringing more people to habitats of conservation concern which are already under pressure. In addition the potential for further future development through expansion of the route, with consequent potential for impacts to designated sites needed to be considered. The consent authority for the proposed greenway is An Bord Pleanála.

On this basis GC and AL highlighted a number of issues:

a. The Route Options Assessment Main Report provides a detailed appraisal of Section 2 of the route including Multi-Criteria Analysis (MCA), which is required under the Public Spending Code for projects between €5 million and €20 million. Sections 1 and 3 have been omitted from MCA in the detailed appraisal stage. The Department recommends that these sections are included in the MCA as set out in the observations issued by the Department because of their potential to impact European sites.

It was queried if alternative routes outside of European sites had been considered for Sections 1 and 3 of the proposed route. In preparing an EIAR reasonable alternatives need to be considered and it was suggested that the applicants should consider looking at alternative routes which avoid potential impacts to European sites as part of the EIA alternatives process. GC noted that whilst European Sites are not excluded from development, there is a need in any appropriate assessment to demonstrate that the proposal will not adversely affect the integrity of a European site or sites. This is so when there is no reasonable scientific doubt as to the absence of such effects.

There was a general discussion in relation to Section 1 of the proposed route and the proposed boardwalk structure. AL clarified a number of points of detail. GC queried if the posts for raised boardwalks would be inserted into the mudflats. CC clarified that they would be placed in the grass verge where possible but some would need to be placed in the mudflats. The structure would be 1 m above the high tide mark to allow light through to the habitat underneath. GC raised concerns about the proposal in relation to land take due to the placement of piles in the ground, the potential impact of the boardwalk on habitats due to light reduction, and the potential impact of increased footfall on birds. GC highlighted the need to ensure any appropriate assessment can conclude that the proposal would not adversely impact the integrity of a European site. GC also mentioned pertinent case law such as the Galway bypass case. CC provided a brief overview of the surveys undertaken on wintering birds to inform the iterative route selection process i.e. in line with Best Practice surveys such as the Low Tide Project. He also referred to a comment in the Department's observations on the occurrence of Annex 1 level saltmarsh along the proposed route, and queried whether this statement was based on more recent surveys than the date of the available information on the NPWS website, in SAC supporting documents.

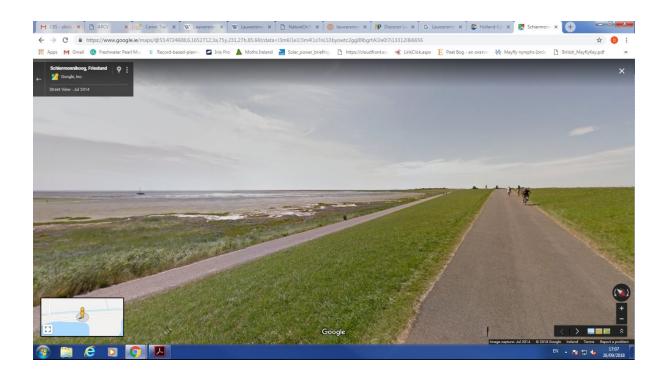
b. GC queried the proposal to locate Section 3 of the route within a European site, given its potential negative impacts on the site including impacts to priority habitats. AL queried

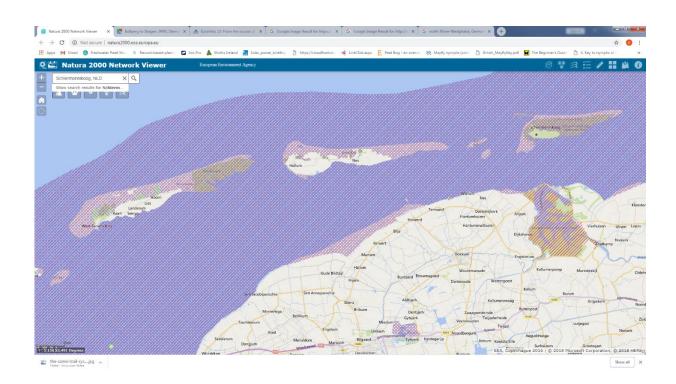
the end location of the greenway (Section 3 of the proposed route) in an unofficial carpark and whether there would be land take here to upgrade the carpark. CR clarified that there was no proposal no proposal to upgrade the carpark as part of this project. There was discussion in relation to potential impacts due to an increase in people coming to this area leading to increased trampling, dune walking, recreational activities etc. which could lead to habitat loss. HW suggested that this is occurring already and needed to be managed. GC acknowledged that the site needed management but suggested that the current greenway proposal may not be the best way to manage the site and could exacerbate the current situation. CC noted that the test as set out in case law suggests that habitat loss may have to be irreparable to constitute adverse effects on site integrity – and queried whether the use of a boardwalk within sand dunes at Mornington would meet this criterion. GC queried if the proposed greenway was part of a bigger plan, to extend proposed greenway further into the European site beyond what was currently proposed, as any cumulative impact would then need to be considered. NW clarified that his was a standalone project at present but more projects could be proposed as part of the national strategy.

- c. FMcG, in stressing the socio economic benefits of the project, discussed the need for the area to be an amenity to draw tourism as well as a commuter corridor between Drogheda and Mornington. With particular reference to the section in Louth FMcG queried whether the section could be just within the SAC/SPA to achieve amenity value as a greenway rather than along the roadside. GC reiterated that while it was agreed that the Councils needed to pursue these objectives, NPWS highlighted the need to ensure that European sites, and biodiversity generally, were protected as part of any proposals.
- d. GC discussed a recent ABP finding that Greenways or Cycleways constitute public roads from a project classification standpoint. (see http://www.pleanala.ie/casenum/303499.htm )
- 4. Before the meeting closed, CC queried whether there was more up to date data on Annex 1 quality salt marsh habitat along the proposed route available from NPWS. He was advised to submit a data request form through the NPWS website and all relevant information would be made available on request. The meeting then closed. CC thanked everyone for their time.

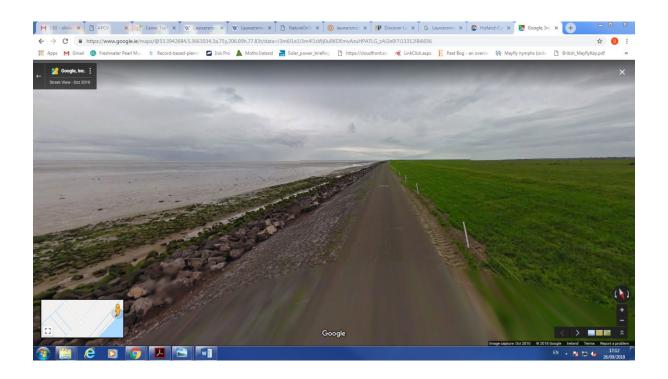
<b>Appendix C: Examples of Greenway Projects in Euro</b>
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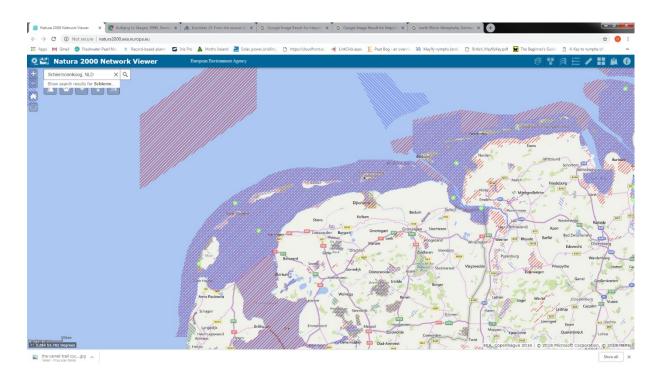
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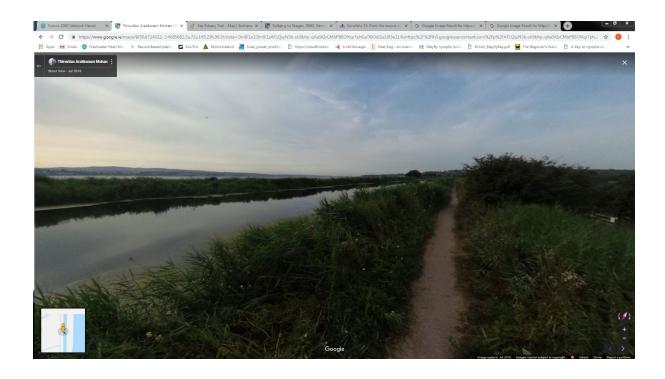


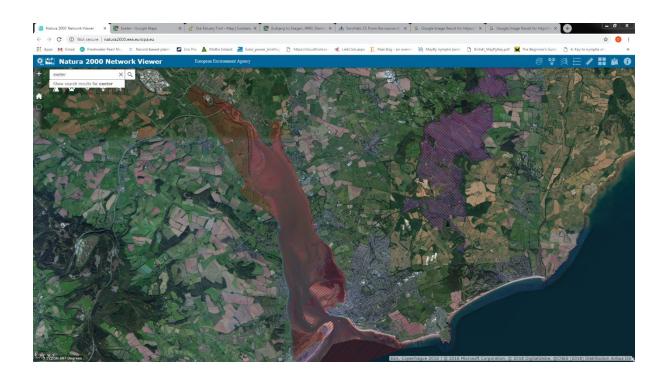
# $Nether lands-Terschelling\,Island-Waddenzee\,SPA; Duinen\,Terschelling\,SAC$



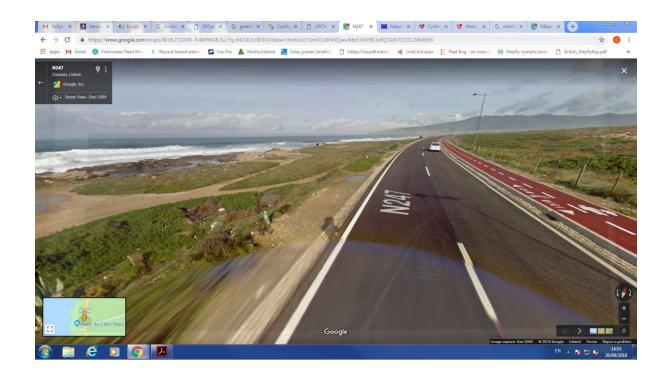


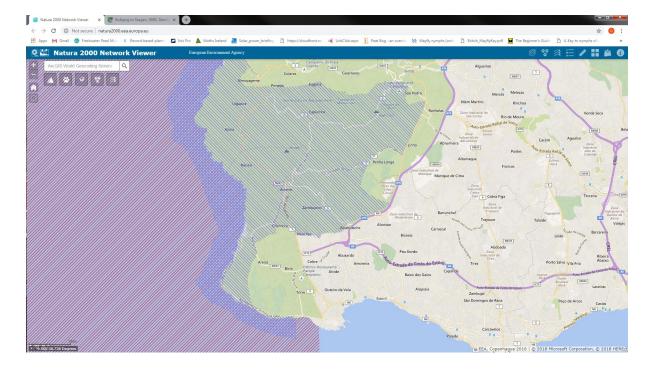
## Exeter – River Exe SPA





# Portugal – Sintra/Cascais SAC





# Portugal – Costa Sudoeste SAC/SPA

