



Waterford to New Ross Greenway

Screening for Appropriate Assessment

.....
DECEMBER 2016
.....



Waterford to New Ross Greenway

Screening for Appropriate Assessment

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Introduction	1
1.2	The Requirement for an Assessment under Article 6.....	1
1.3	Legislative Context.....	1
1.4	Stages of an Article 6 Assessment	2
1.5	Scope of the Screening for Appropriate Assessment.....	2
1.6	Sources of Guidance.....	4
2.0	DESCRIPTION OF THE PROJECT	5
2.1	Background.....	5
2.2	Location	5
2.3	History of the Railway Line.....	5
2.4	Construction Methodology.....	7
2.5	Construction Methodology in the River Barrow and River Nore SAC.....	8
2.6	Drainage	8
2.7	Ecological Surveys.....	8
3.0	NATURA 2000 SITES	9
3.1	Proximity to Natura 2000 Site(s).....	9
3.2	Risk to Qualifying Interests.....	12
3.3	Effects on Conservation Objectives.....	12
4.0	ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS	29
4.1	Assessment Criteria	29
4.2	Potential Abiotic Changes	31
4.3	Consideration of Potential Cumulative Impacts	31
5.0	DISCUSSION AND CONCLUSION.....	33
6.0	REFERENCES	34
APPENDIX A	NPWS Site Synopses & Conservation Objectives	
APPENDIX B	Response from IFI	
APPENDIX C	Response from DAHG	

1.0 INTRODUCTION

1.1 Introduction

Roughan & O'Donovan (ROD Environmental) were appointed by Trail Kilkenny and the Kilkenny LEADER Partnership to undertake Screening for Appropriate Assessment (AA) for the proposed Waterford to New Ross Greenway, hereafter referred to as "the Greenway", in order to enable the competent authority, to comply with Article 6(3) of Council Directive 92/43/EEC (the Habitats Directive). During preparation of the Screening report, the statutory consultee, the National Parks & Wildlife Service (NPWS), provided data on designations of sites, habitats and species of conservation interest. Our focus was on potential direct, indirect or cumulative effects on sites of European importance for nature conservation, *i.e.* Natura 2000 sites.

1.2 The Requirement for an Assessment under Article 6

According to Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations, 2011-2015, the competent authority has a duty to:

- Determine whether the proposed Project is directly connected to or necessary for the management of one or more Natura 2000 sites; and, if not,
- Determine if the Project, either individually or in combination with other plans or projects, would be likely to have a significant effect on the Natura 2000 site(s) in view of best scientific knowledge and the Conservation Objectives of the site(s).

This report contains a Screening for Appropriate Assessment and is intended to assess and address all issues regarding the construction and operation of the Project and to inform and allow the competent authority to comply with the Habitats Directive. Article 6(3) of the Habitats Directive defines the requirements for assessment of projects and plans for which likely significant effects on Natura 2000 sites may arise.

1.3 Legislative Context

The European Communities (Birds and Natural Habitats) Regulations, 2011-2015 (the Habitats Regulations) transpose into Irish law Directive 2009/147/EC (the Birds Directive) and Council Directive 92/43/EEC (the Habitats Directive) and list habitats and species that are of international importance for conservation and require protection. This protection is afforded in part through the designation of sites that represent significant examples of habitats that support populations of listed species within a European context, known as Natura 2000 sites. Sites designated for bird species are classed as Special Protection Areas (SPAs) and sites designated for other protected species and/or habitats are classed as Special Area of Conservations (SACs). Together, SPAs and SACs comprise the Natura 2000 network of protected sites.

Bird species listed on Annex I of the Birds Directive and habitats and/or species listed on Annexes I and II, respectively, of the Habitats Directive (Qualifying Interests) have full European protection in Natura 2000 sites. Species listed on Annex IV of the Habitats Directive are protected wherever they occur, whether inside or outside the Natura 2000 network. Annex I habitats that occur outside of SACs are still considered to be of national and international importance and, under Regulation 27(4) (b) of the Habitats Regulations, public authorities have a duty to avoid the pollution or deterioration of these habitats.

The Habitats legislation requires competent authorities, to carry out a Screening for Appropriate Assessment of plans and projects that, alone and/or in combination with other plans and projects, would be likely to have significant effects on Natura 2000 sites in view of best scientific knowledge and the sites conservation objectives. This requirement is transposed into Irish law by Part 5 of the Habitats Regulations and Part XAB of the Planning and Development Act, 2000 (as amended). Natura 2000 sites are assigned Conservation Objectives of restoration or maintenance of their "favourable conservation condition" based on the identified Qualifying Interests of the sites. These are described by a set of Attributes with

corresponding Targets that must be met if the Conservation Objective for a given Qualifying Interest is to be achieved.

The Waterford to New Ross Greenway is subject to the requirement to screen for Appropriate Assessment pursuant to Regulation 42(1) of the Habitats Regulations and Part XAB: Section 177U(1) of the Planning and Development Act, 2000 (as amended).

1.4 Stages of an Article 6 Assessment

The European Commission's *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* (EC, 2001) prescribes a staged process, as set out below, the need for each stage being dependent on the outcomes of the preceding stage.

1. Screening for Appropriate Assessment
2. Appropriate Assessment
3. Assessment of Alternative Solutions
4. Assessment where no alternative solutions exist and adverse impacts remain, *i.e.* the Imperative Reasons of Overriding Public Interest test, and compensatory measures.

The Habitats Directive sets out a hierarchy of avoidance, mitigation and compensatory measures. Stage 1 of the process is referred to as Screening for Appropriate Assessment and identifies whether the Project, either on its own or in combination with other plans of projects, would be "likely to have a significant effect" upon any European site, *i.e.* any Natura 2000 site, in view of best scientific knowledge and the site's Conservation Objectives. Screening is undertaken without the inclusion of mitigation, except where it is intrinsic to the design of the plan or project, as established in Case Law, *e.g.* *Rossmore v. An Bord Pleanála*. If effects are considered likely to be significant, potentially significant or uncertain, or if the Screening process becomes overly complicated, the process must proceed to Stage 2: Appropriate Assessment, with the preparation of a Natura Impact Statement to inform the Appropriate Assessment that is to be conducted by the competent authority.

Stage 2 includes detailed impact prediction and assessment of the likely effects on the Natura 2000 sites(s) in question and the proposal of specific mitigation measures, where necessary. If adverse effects on the integrity of a European Site cannot be ruled out, then the process continues to Stage 3 and assesses whether alternative solutions exist. If no alternatives exist and impacts on Natura 2000 sites are unavoidable, then a proposed plan or project can only be implemented where there are imperative reasons of overriding public interest, as detailed in Article 6(4) of the Habitats Directive.

1.5 Scope of the Screening for Appropriate Assessment

This Appropriate Assessment Screening report has been prepared in accordance with current guidance (DEHLG, 2010) and provides the information required to establish whether or not the Project, either on its own or in combination with other plans and projects, would be likely to have any significant effect(s) on Natura 2000 sites in view of best scientific knowledge and in the context of sites' Conservation Objectives and includes the following details:

Description of the Project

- Location of the Project and distances from Qualifying Interests of Natura 2000 sites, including a map of the Project in relation to Natura 2000 boundaries;
- The size, scale, area of the Project in relation to Natura 2000 sites and projected level of activity, class of activity and frequency; and,
- Details of construction works including duration, materials and physical changes as detailed for the Project and any possible impacts that the proposed construction may have on the defining structure and function of the Natura 2000 sites.

Potential Impacts on Natura 2000 sites with respect to Conservation Objectives

- The impact of the proposed construction/operation on the defining structure and function of the Natura 2000.

Section 3.2.3 of DEHLG (2010) states that the specific approach to Screening for Appropriate Assessment, *i.e.* determining which Natura 2000 sites to include for assessment, depends on the nature, size and location of the project and the sensitivities of the ecological receptors, as well as the potential for in combination effects, while cognisant of the Precautionary Principle¹.

¹ The precautionary principle, derived from the EU Treaty and developed in the case law of the ECJ, is one of the foundations of the high level of protection pursued by EU Community policy on the environment, and underpins the Habitats Directive. In effect it means that where doubt exists about the risk of a significant effect, an Appropriate Assessment must be carried out.

1.6 Sources of Guidance

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Official Journal of the European Communities, L206/7;
- DEHLG (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin;
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Birds Directive). Official Journal of the European Union, L20/7;
- European Communities (Birds and Natural Habitats) Regulations 2011. *SI No. 477/2011*;
- NPWS (2010) *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular Letter NPWS 1/10 & PSSP 2/10. Department of Environment, Heritage and Local Government, Dublin;
- NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland. Volume 2 & 3: Article 17 Assessments*. Department of Arts, Heritage and Gaeltacht, Dublin;
- EC (2000) *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission;
- EC (2001) *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*. Environment Directorate-General of the European Commission;
- IFI (2016) *Guidelines on protection of fisheries during construction works in and adjacent to waters*. Inland Fisheries Ireland; and,
- Part XAB of the Planning and Development Act, 2000 (as amended).

2.0 DESCRIPTION OF THE PROJECT

2.1 Background

The Irish Government policy entitled *Smarter Travel: A Sustainable Transport Future*, which runs from 2009 to 2020, identifies certain key goals and objectives for a national sustainable transport network. A National Cycle Policy (NCP) was implemented to run alongside the main policy document. The NCP mission states an objective to create a strong cycling culture in Ireland while also encouraging recreational cycling.

The Greenway aims to feed into the local and national tourism strategy and complement the existing natural, cultural and built heritage along the route. The Greenway does not form any part of the NCP Wexford to Tralee Corridor No. 3 outlined in the Scoping Study of the same name in 2010. However, it has the potential to link to this corridor and join with other proposed schemes such as the Red Bridge Walking and Cycling Trail, which loops from New Ross to Redbridge in County Wexford.

The proposed Greenway will provide a safe environment for tourists and local users to walk and cycle by providing a 3 m wide surfaced path along the entire length of the existing Waterford to New Ross disused railway (22 km). The Project is not directly connected with or necessary for the management of any European site for nature conservation, *i.e.* any Natura 2000 site.

2.2 Location

The proposed Greenway will be located along the disused railway line between Waterford City and the bridge crossing in New Ross town. The route of the disused railway runs east from the dockyards in Waterford city along the northern quays at Abbey Junction, through Ferrybank, a residential area on the edge of the city, and then into open agricultural land. The route passes over and under several roadways, including the N29, after which it follows a northerly direction parallel to the N25 for c. 3 km veering north east towards the River Barrow and the town land of Carrigcloney. The railway line passes through the River Barrow and River Nore SAC twice, between for c. 1 km where it bridges the Glenmore River and again for c. 100m where it crosses Locesa Road. The route then continues north-west back towards the N25 running parallel until it emerges near O'Hanrahan Bridge in New Ross town (Figure 1).

2.3 History of the Railway Line

When opened in 1887, the railway linked Macmine Junction on the Dublin to Wexford line to New Ross. In 1904 the line from New Ross to Waterford was opened with one intermediate stop at Glenmore.

In 1963, the line from Macmine Junction closed and the track was removed. The remaining branch from Waterford stayed open to daily goods traffic, which ceased in 1976. The line officially remained open until 1995 for the purposes of conducting special fertilizer traffic from the Albatros fertilizer factory into the town. Irish Rail no longer carries fertilizer traffic. New Ross station officially remains open, but the rails at level crossings on the Main Waterford Road and at the station gates are now covered over. The line is now effectively defunct as the connection to the main line at Abbey Junction in Waterford has been removed.

Access is restricted along the majority of the route with few open access points from public roads. The railway corridor is heavily overgrown with dense bramble and regenerating scrub which restricts access. The railway and sleepers are still in place for its entire length, although many of the sleepers are now poor condition.

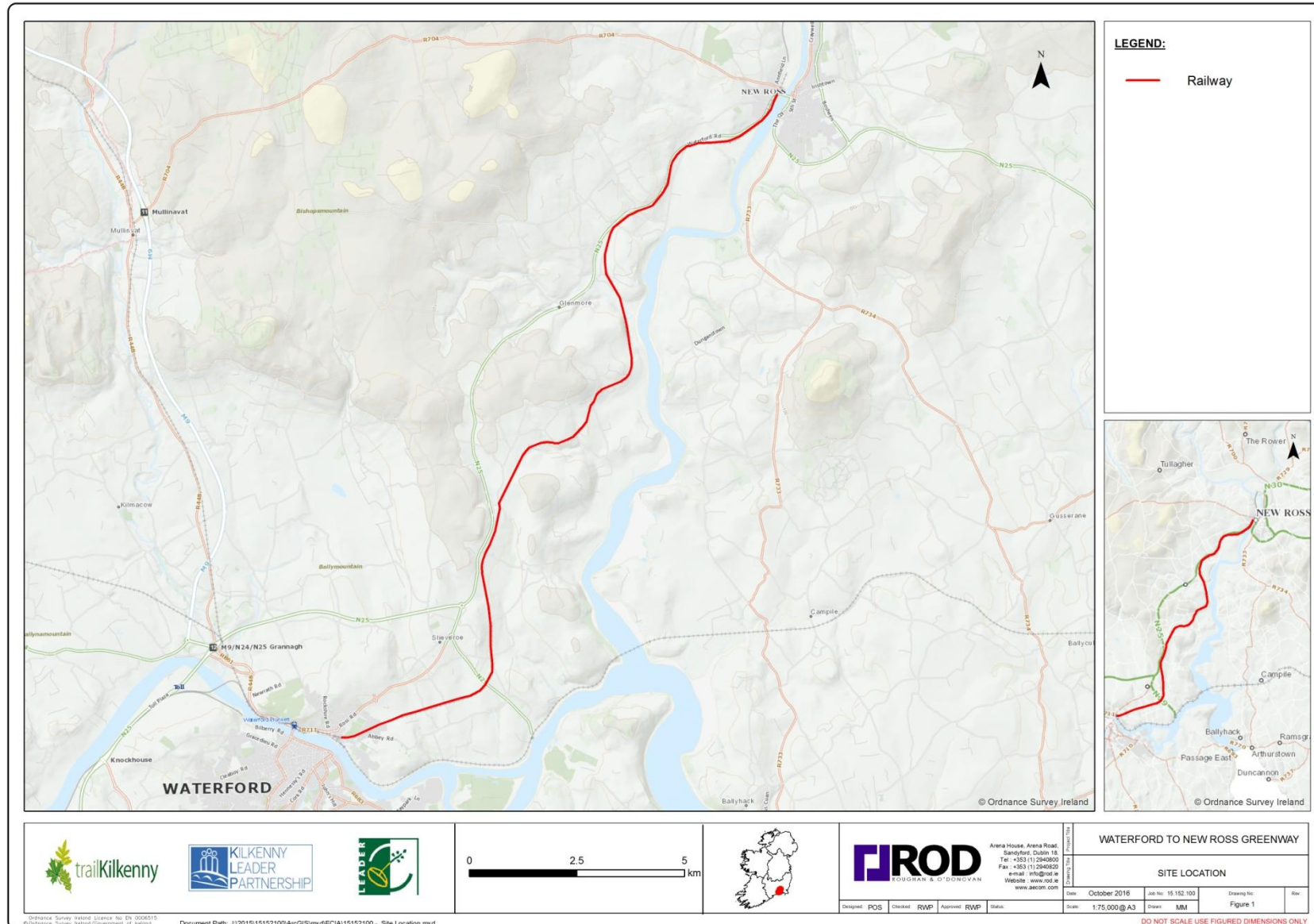


Figure 1. Location of the Greenway.

2.4 Construction Methodology

The railway corridor was constructed to accommodate a single track. This track is generally located in the centre of the corridor but does move in position on approaches to corners. It is proposed to locate the Greenway on top of the existing railway. The proposed Greenway is to be 3m wide, made up of 40mm bituminous surface laid on 150mm of crushed stone sub-base. The sub-base should be laid with a paving machine so as to give a high-quality surface level control. The Greenway will be constructed entirely on the existing railway infrastructure.

The sequence and timing for the works will be structured to allow environmental factors to be accommodated at appropriate stages. The Greenway is expected to be in the order of twelve months in duration. Access to the works will make use of existing public roads and private tracks. Lightweight machinery (e.g. excavators, dumpers and pavers) will be used in the construction of the Greenway. A detailed Ecological Impact Assessment (EclA) for the entire Project is submitted in support of the Part VIII application. All works near watercourses or waterbodies will adhere to generic best practice guidance in minimising any potential impacts during site preparation and construction stages (IFI, 2016).

Hedgerows and treelines will be maintained where possible; however removal of overgrown and encroaching vegetation on the disused railway will be necessary for site access and construction on all sections of the Greenway. Under Section 40 of the Wildlife Acts, 1976-2012, road or other construction works; or, the development or preparation of sites on which any building or other structure is intended to be provided are exempt from restrictions in regard to clearance of vegetation. However, if vegetation removal is required during the restricted period (1st March to 31st August), a site inspection by a suitably qualified Ecologist (Ecological Clerk of Works) prior to and during clearance at these locations is considered best practice to ensure reasonable efforts are undertaken to comply with other requirements of the Wildlife Acts and allow works to proceed.

It is envisaged that the railway track will be removed and Iarnród Éireann will wish to salvage the old rails and some of the sleepers if in a good condition. The remaining sleepers will be left in place or may be used as local features along the route such as fencing, public seating, sign posts etc. The existing ballast will remain in position to act as part of the foundation layer for the cycleway. Some sleepers may be used as local features along the route such as fencing, public seating, sign posts etc where appropriate.

A number of existing railway bridges over local roads and/or watercourses and will require retrofitting to accommodate the Greenway. Thirteen of the bridges are in varying states of repair with bridge decks and/or parapets in poor condition. All works to upgrade bridge decks will include routine maintenance or the provision of a new concrete deck on the existing railway. No earthworks, remedial works, construction or instream works outside the existing railway are required as part of the proposed Greenway.

Five at-grade road crossings exist along the proposed route. These will require traffic calming works to provide a safe crossing point for all users of the Greenway. Proposed works may include additional road markings, signage and other traffic calming requirements on the local road.

The trail will be added to the suite of trails managed under the "Trail Kilkenny" project. The team have the training, skills and equipment to maintain a trail of this Greenway.

2.5 Construction Methodology in the River Barrow and River Nore SAC

Site works for the Greenway at its location through the boundary of River Barrow and River Nore SAC will be undertaken within the 5 m construction envelope using lightweight machinery to avoid any potential negative adverse impact on the SAC. Five bridges cross watercourses with direct hydrological links to the SAC. Inland Fisheries Ireland guidance (IFI, 2016) will be strictly adhered to and no in-stream works will take place.

There is a masonry and iron bridge at the crossing of Glenmore River, a tributary of the River Barrow. All works on this bridge will take place on the bridge surface only and within the existing railway environment. The bridge itself is visually in good condition. To provide a suitable crossing for cyclists and walkers a lightweight decking will be retrofitted on to the existing bridge deck. Appropriate fencing on the approach embankments will also be required with the inclusion of new seating areas and tourist boards outlining information of the surrounding environment.

2.6 Drainage

The existing drainage paths which are located along the railway are to be retained. A proposed cross fall of 2% will direct run-off towards the existing drainage ditch adjacent to the disused railway. Drainage ditches adjoining the SAC will be maintained in their present condition. As the run-off from the Greenway will be largely contained, the existing drainage ditches are considered ample to provide sufficient drainage capacity for the 3 m wide Greenway. The incorporation of an additional closed drainage system will be used where the condition of the existing drainage ditches during construction suggests this is the most appropriate option.

2.7 Ecological Surveys

In order to examine baseline ecological conditions and determine the presence and proximity of any Qualifying Interests of Natura 2000 sites in relation to the Greenway, a robust desk study was undertaken. Data relating to conservation designations and protected species in relation to the Greenway were obtained from statutory and non-statutory consultees.

The desk study was undertaken throughout the period from October to November 2016 and included review of Article 17 reporting of the Habitats Directive (NPWS, 2013), Site Synopses, Natura Standard Data Forms and Conservation Objectives for Natura 2000 sites, in particular for the Lower River Suir SAC and the River Barrow and River Nore SAC and the National Biodiversity Data Centre (NBDC) online database (NBDC, 2016). The results of the desk study were used to inform the design of the field surveys.

A baseline ecological survey was commissioned and undertaken by ROD ecologists in September 2015. Due to access constraints (overgrown areas and difficulty with visual assessments or attaining access), a definitive record of species and habitats on site could not be completed. A complete ecological multidisciplinary walkover and habitat survey was undertaken along the entire 22 km of the Greenway in March 2016 adhering to Transport Infrastructure Ireland (TII) *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (2008). During this site walkover, particular attention was given to physical and natural features with potential to support protected mammals, e.g. Bats, Badger and Otter. Habitats present were classified in accordance with *A Guide to Habitats in Ireland* (Fossitt, 2000) and mapped following *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011). Additionally, an Invasive Alien Plant Species (IAPS) survey was undertaken concomitantly to determine presence and extent of infestation along the railway corridor.

Consultation, desk study and field surveys identified two Natura 2000 sites, namely the Lower River Suir SAC and the River Barrow and River Nore SAC, and a number of the Qualifying Interests of these sites as being of particular interest in relation to the Screening for Appropriate Assessment.

The information gathered during the consultation, desk study and multidisciplinary walkover surveys was used and assessed to inform the Screening for Appropriate Assessment process, in particular, in the identification of pathways of risk between the Project and the Qualifying Interests of the Lower River Suir SAC and the River Barrow and River Nore SAC and assessment of the likely significant effects of the Project in view of the Conservation Objectives of each site.

3.0 NATURA 2000 SITES

3.1 Proximity to Natura 2000 Site(s)

Section 3.2.3 of the *Guidance for Planning Authorities* (DEHLG, 2010) outlines the procedure for selecting the Natura 2000 sites to be subject to Screening. It states that Natura 2000 sites potentially affected should be identified and listed, bearing in mind the potential for direct, indirect and/or cumulative effects. It also states that the specific approach to Screening in each case is likely to differ depending on the scale and likely effects of the plan or project. However, it advises that the following sites should generally be included:

- All Natura 2000 sites within or immediately adjacent to the plan or project area;
- All Natura 2000 sites within the likely zone of impact of the plan or project; and,
- In accordance with the Precautionary Principle, all Natura 2000 sites for which there is doubt as to whether or not they might be significantly affected.

The “likely zone of impact” of a plan or project is the geographic extent over which significant ecological effects are likely to occur. In the case of plans, DEHLG (2010) recommends that this zone extend to a distance of 15 km in all directions from the boundary of plan area. In the case of projects, however, the guidance recognises that the likely zone of impact must be established on a case-by-case basis, with reference to the following key variables:

- The nature, size and location of the project;
- The sensitivities of the ecological receptors; and,
- The potential for cumulative effects.

For example, in the case of a project that could affect a watercourse, it may be necessary to include the entire upstream and/or downstream catchment in order to capture all Natura 2000 sites with water-dependent Qualifying Interests.

Following the guidance provided in DEHLG (2010) and taking into account the key variables outlined above, the likely zone of impact was defined as the area within 1 km of the centreline of the proposed Greenway. ArcView software was used in conjunction with publicly available Ordnance Survey Ireland maps and NPWS shapefiles to identify the boundaries of Natura 2000 sites in relation to the likely zone of impact (Table 1; Figure 2).

It was determined that two Natura 2000 sites, *i.e.* the Lower River Suir Special SAC and the River Barrow and River Nore SAC, occur within the likely zone of impact. The closest proximity of the Greenway to the Lower River Suir Special SAC is 100m. The Greenway crosses the River Barrow and River Nore SAC at two locations.

Table 1. Proximity of the Greenway to Natura 2000 sites.

Natura 2000 site	Site description	Closest proximity
<p>Lower River Suir Special SAC [002137] Site area: 7,099.99 ha</p>	<p>This site consists of the freshwater stretches of the River Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford. The Suir and its tributaries flow through the counties of Tipperary, Kilkenny and Waterford. The Lower River Suir contains excellent examples of a number of Annex I habitats, including the priority habitats alluvial forest and Yew woodland. The site also supports populations of several important animal species; some listed on Annex II of the Habitats Directive or listed in the Irish Red Data Book. The presence of two legally protected plants (Flora (Protection) Order, 2015) and the ornithological importance of the site adds further to the ecological interest.</p>	<p>The Greenway is located 80 m from the SAC at the Waterford Dockyards at Ch. 0+000.</p>
<p>River Barrow and River Nore SAC [002162] Site area: 12,373.17 ha</p>	<p>This site comprises the River Barrow and River Nore catchments from the source in the Slieve Bloom Mountains to Creadan Head in Waterford. Urban centres along the site include Portarlinton, Athy, Carlow, Kilkenny and New Ross. Overall, it is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the Habitats Directive. Furthermore, it is of high conservation value for its populations of a number of bird species listed on Annex I of the Birds Directive. The occurrence of several Red Data Book plant species and the endemic population of the hard-water form of the Freshwater pearl mussel (limited to a 10 km stretch of the Nore) add further value to this site.</p>	<p>The Greenway crosses the SAC, between 13+100 and 14+180 at the Glenmore River and at between 16+450 and 16+500 at Locesa Road.</p>

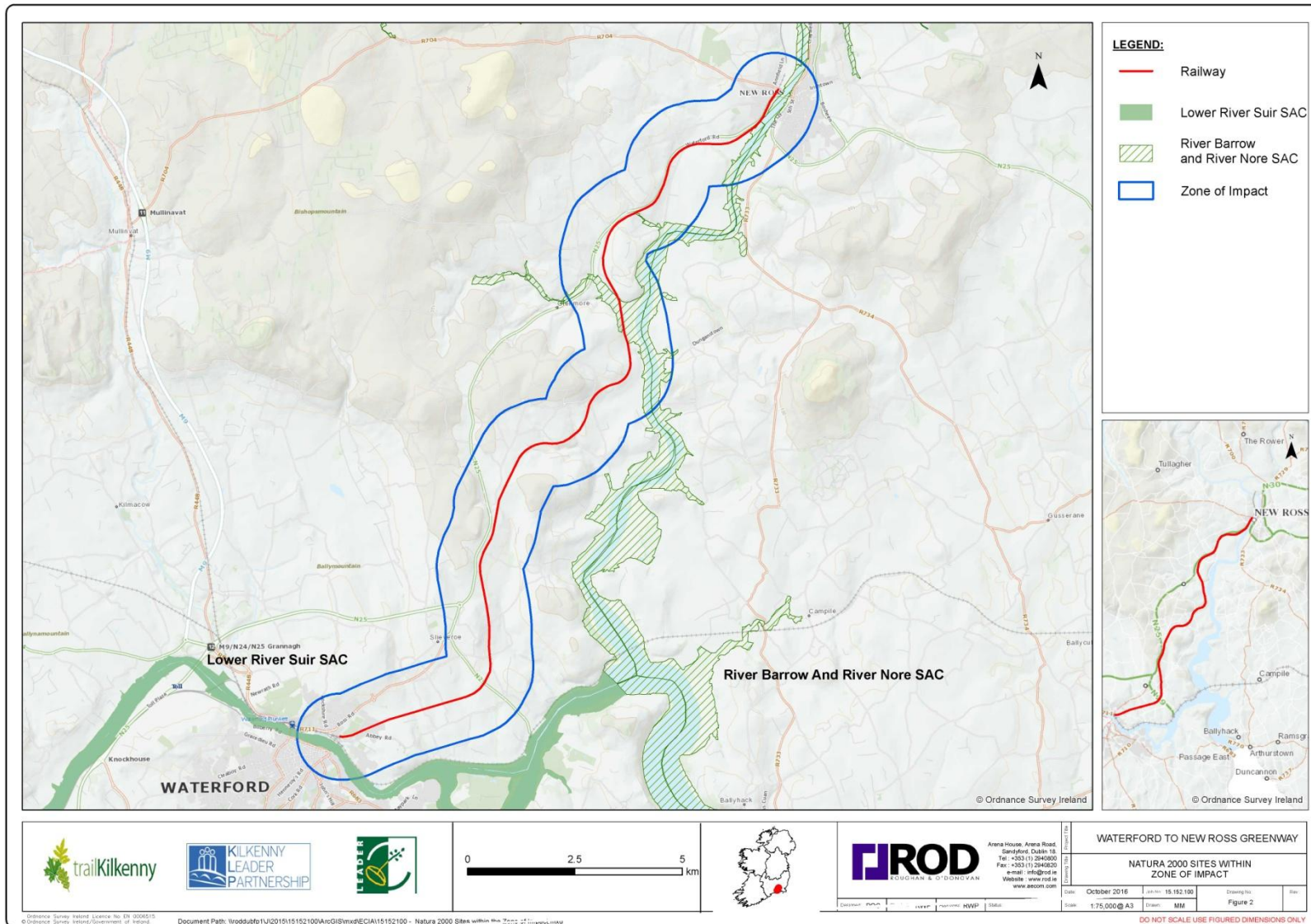


Figure 1. Location of Natura 2000 sites in the likely zone of impact.

3.2 Risk to Qualifying Interests

In Ecological and Environmental Impact Assessment, for an impact to occur there must be a risk enabled by having a “source”, e.g. construction works at a proposed development site, a “receptor”, e.g. an SAC or other ecologically sensitive feature, and a pathway between the source and the receptor, e.g. a watercourse connecting the proposed development site to the SAC. The risk of the impact does not automatically mean that it will occur or that it will be significant. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the receptor.

In the case of the construction and operation of the Waterford to New Ross Greenway, sources of risk are considered to include potential loss and/or fragmentation of habitats, noise, vibration, lighting, pollution and mobilisation of sediment. Pathways that may convey these risks to ecological receptors include physical proximity, air, water and ecological interactions. The ecological receptors relevant to the Screening for Appropriate Assessment are the Qualifying Interests of the Lower River Suir SAC and the River Barrow and River Nore SAC. The Screening Matrix (Table 2) below identifies the Qualifying Interests that are connected, either directly or indirectly, by a pathway of risk to a source of risk at the Greenway.

3.3 Effects on Conservation Objectives

As explained in Section 1.3, each Qualifying Interest in each Natura 2000 site is assigned a Conservation Objective of either restoration or maintenance of its “favourable conservation condition”, as described by a set of Attributes with corresponding Targets that must be met if the specific Conservation Objective for that Qualifying Interest is to be achieved. The restoration and maintenance of the favourable conservation condition of habitats and species within Natura 2000 sites contributes to the overall conservation status of those habitats and species at a national level. Favourable conservation condition is described in more generic terms below.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;
- the specific structures and functions necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and,
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and,
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Site-specific Conservation Objectives for the River Barrow and River Nore SAC have been published by the NPWS and are listed and detailed in full in Appendix B. Site specific conservation objectives for the Lower River Suir SAC have currently not been developed, however generic Conservation Objectives apply. For the purposes of the Screening, Conservation Objectives for the relevant Qualifying Interests present in the Lower River Suir SAC have been derived from the Conservation Objectives of the River Barrow and River Nore SAC, as recommended by NPWS. The potential for likely significant effects on the Qualifying Interests of the Lower River Suir SAC and the River Barrow and River Nore SAC is assessed in view of the relevant Conservation Objectives in the Screening Matrix (Table 2) below. Where potential pathways of risk between the Project and the Qualifying Interest are identified, the likely effects on the relevant Conservation Objectives are assessed with regard to their respective Attributes and Targets

Table 2. Screening Matrix for the Lower River Suir SAC. Source: NPWS (2013), unless specifically referenced. * = a “priority habitat” in danger of disappearing from the EU. Numbers in square brackets are Natura 2000 codes.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330]	Potentially on the banks of the Suir Estuary 100m west of the start of the Greenway in Waterford.	Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient. They exhibit a distinctive topography with an intricate network of creeks and salt pans occurring on the larger marshes. This habitat contains several distinctive zones that are related to elevation and frequency of submergence. The lowest part along the tidal zone is generally dominated by common saltmarsh-grass (<i>Puccinellia maritima</i>). This habitat is also important for other wildlife including wintering waders and wildfowl. Atlantic salt meadows are distributed around most of the coastline of Ireland. 38 SACs are designated for Atlantic salt meadows in the Member State. It is estimated that a total of 1,479–2,590 ha of this habitat occurs within the Natura 2000 network. This habitat forms c. 1% (123.73 ha) of the Lower River Suir SAC, equivalent to c.4.8–8.4% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate but “stable”, owing to pressures and threats such as intensive grazing and paths/tracks and cycling tracks.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Atlantic salt meadows in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	Area stable or increasing, subject to natural processes, including erosion and succession	No LSE – There will be no reduction in habitat area as a result of the Greenway as no works will be undertaken within this habitat.
					Habitat Distribution	No decline, or change in habitat distribution, subject to natural processes	No LSE – There will be no reduction in habitat distribution as a result of the Greenway.
					Physical Structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No LSE – There will be no alteration in sediment supply as a result of the Greenway.
					Physical structure: creeks and pans	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	No LSE – There will be no alteration in creek and pan structure as a result of the Greenway.
					Physical Structure: flooding regime	Maintain natural tidal regime	No LSE – There will be no alteration in the tidal regime as a result of the Greenway.
					Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	No LSE – There will be no alteration in the range of coastal habitats as a result of the Greenway.
					Vegetation structure: vegetation height	Maintain structural variation within sward	No LSE – There will be no alteration in the structural variation as a result of the Greenway.
					Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	No LSE – There will be no alteration in vegetation cover as a result of the Greenway.
					Vegetation composition: typical species and sub communities	Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Greenway (McCorry and Ryle, 2009)	No LSE – There will be no alteration in the range of subcommunities as a result of the Greenway.
					Vegetation Structure: negative indicator species <i>Spartina anglica</i>	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	No LSE – There will be no expansion of common cordgrass as a result of the Greenway.

Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	Potentially on the banks of the Suir Estuary 100m west of the start of the Greenway in Waterford.	Mediterranean salt meadows occupy the upper zone of saltmarshes and usually occur adjacent to the boundary with terrestrial habitats. They are widespread on the Irish coastline but are not as extensive as Atlantic salt meadows. The habitat is distinguished from Atlantic salt meadows by the presence of rushes such as sea rush (<i>Juncus maritimus</i>) and/or sharp rush (<i>J. acutus</i>), along with a range of species typically found in Atlantic salt meadows, including sea aster (<i>Aster tripolium</i>), sea purslane (<i>Atriplex portulacoides</i>), sea-milkwort (<i>Glaux maritima</i>), saltmarsh rush (<i>J. gerardii</i>), parsley water-dropwort (<i>Oenanthe lachenalii</i>), sea plantain (<i>Plantago maritima</i>) and common saltmarsh-grass (<i>Puccinellia maritima</i>). 33 SACs are designated for this habitat type in the Member State. It is estimated that a total of 577–591 ha of Mediterranean salt meadows occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the Lower River Suir SAC, equivalent to c.21% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate but “stable”, owing to pressures and threats such as intensive cattle grazing and walking/cycling tracks.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Mediterranean salt meadows in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	Area stable or increasing, subject to natural processes, including erosion and succession.	No LSE – There will be no reduction in habitat area as a result of the Greenway.
					Habitat Distribution	No decline, or change in habitat distribution, subject to natural processes.	No LSE – There will be no reduction in habitat distribution as a result of the Greenway.
					Physical Structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No LSE – There will be no alteration in sediment supply as a result of the Greenway.
					Physical structure: creeks and pans	Maintain creek and pan structure, subject to natural processes, including erosion and succession	No LSE – There will be no alteration in creek and pan structure as a result of the Greenway.
					Physical Structure: flooding regime	Maintain natural tidal regime	No LSE – There will be no alteration in the tidal regime as a result of the Greenway.
					Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	No LSE – There will be no alteration in the range of coastal habitats as a result of the Greenway as no works will be undertaken within coastal habitats.
					Vegetation structure: vegetation height	Maintain structural variation within sward	No LSE – There will be no alteration in the structural variation as a result of the Greenway as no works will be undertaken within this habitat.
					Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	No LSE – There will be no alteration in vegetation cover as a result of the Greenway as no works will be undertaken within this habitat.
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	At least 12km upstream in the nearest freshwater river in the SAC, the Clodaigh River.	The description of this habitat type is broad, covering rivers from upland bryophyte and macroalgal-dominated stretches, to lowland depositing rivers with pondweeds and starworts. Selection of SACs for this habitat in Ireland has used this broad interpretation. 21 SACs are designated for Floating river vegetation in the Member State. It is estimated that a total of 3,246 ha of Floating river vegetation occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the Lower River Suir SAC, equivalent to c.3.8% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate and “declining” due to numerous pressures, including pollution from agricultural, forestry and industrial sources, as well as modification of hydrological regimes.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.	No Likely Significant Effect – Given the distance between the Greenway and Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.	

<p>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]</p>	<p>At least 12km upstream in the nearest freshwater river in the SAC, the Clodaigh River.</p>	<p>Three distinct communities can be considered for this habitat in Ireland. In the lowlands, it occurs as a community of watercourses, particularly unmanaged edges of slow-moving rivers and the margins of lakes. Nutrient levels may be naturally high. The community is dominated by tall hydrophilous herbs and horsetails (<i>Equisetum</i> spp.) are a common feature, but monospecific stands are not including Reed beds, large sedge swamps, large areas of fallow wet meadow are excluded from the classification.</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)</p>	<p>The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.</p>	<p>No Likely Significant Effect – Given the distance between the Greenway and Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.</p>
<p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p>	<p>15 km upstream of Waterford on the banks of the Clodiagh River outside Portlaw.</p>	<p>Old oak woodlands are defined in the interpretation manual of EU habitats as "acidophilous <i>Quercus petraea</i> woods, with low, low-branched, trees, with many ferns, mosses, lichens and evergreen bushes". 40 SACs are designated for this habitat type in the Member State and it is estimated that a total of 3,899 ha of the habitat type occurs within the Natura 2000 network. This habitat forms c. 1.0% (123.73 ha) of the SAC, equivalent to c.3.1 % of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Bad but "improving".</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>To restore the favourable conservation condition of Old oak woodland with <i>Ilex</i> and <i>Blechnum</i> in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)</p>	<p>The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.</p>	<p>No Likely Significant Effect – Given the distance between the Greenway and Old oak woodland with <i>Ilex</i> and <i>Blechnum</i>, the Greenway would not be likely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.</p>
<p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)* [91E0]</p>	<p>20km upstream of Waterford above the tidal limit of the river near Carrick-on-Suir.</p>	<p>Residual alluvial forests occur on heavy soils that are periodically inundated by the annual rise of river levels, but which are otherwise well drained and aerated during low water. 25 SACs are designated for this habitat type in the Member State. It is estimated that a total of 1,046 ha of 91E0 occurs within the Natura 2000 network. This habitat forms c. 1.0% (123.73ha) of the SAC, equivalent to c. 11.82% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Bad but "improving".</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)</p>	<p>The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.</p>	<p>No Likely Significant Effect – Given the type of impacts likely to arise from the Greenway and the sensitivities of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>), the Greenway would be unlikely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.</p>
<p><i>Taxus baccata</i> woods of the British Isles* [91J0]</p>	<p>> 50 km upstream at Cahir Park.</p>	<p>Two stands of Yew (<i>Taxus baccata</i>) woods, a rare habitat in Ireland and the EU, occur within the site. Yew woodland is a highly restricted habitat type in Ireland which occurs at a handful of sites on outcropping limestone with skeletal soils in the south-western part of the country in these stands is typically dominated by <i>Taxus baccata</i> with <i>Fraxinus excelsior</i>, <i>Corylus avellana</i> and <i>Ilex aquifolium</i> often frequent. The ground is generally covered by an extensive bryophyte carpet dominated by a few robust pleurocarpous species, e.g. <i>Thamnobryum alopecurum</i>, <i>Neckera crispa</i>. Where present, the field layer consists of the grass <i>Brachypodium sylvaticum</i>, herbs (e.g. <i>Viola iviniana/reichenbachiana</i>, <i>Potentilla sterilis</i>) and ferns (e.g. <i>Phyllitis scolopendrium</i>). This woodland type has been classified as a facies of the <i>Corylo-Fraxinetum</i> association by Kelly (1981) and shares many of the same species. Reliable data for the extent and distribution of this Qualifying Interest in the Member State and Natura 2000 network is not available</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>Site-specific Conservation Objectives have not yet been set for this Qualifying Interest in any Natura 2000 site; therefore, the generic conservation objectives above apply</p>	<p>The definition of favourable conservation condition in respect of species, as given in Section 3.3 above, was considered in the Screening process with regard to this Qualifying Interest.</p>	<p>No Likely Significant Effect – Given the distance between the Greenway and <i>Taxus baccata</i> woods of the British Isles*, the Greenway would not be likely to compromise the generic Conservation Objectives for species within SACs with respect to this Qualifying Interest.</p>

<p>Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029]</p>	<p>At least 12km upstream in the nearest freshwater river in the SAC, the Clodaigh River.</p>	<p>The Freshwater pearl mussel <i>Margaritifera margaritifera</i> grows to 140 mm in length, and burrows into sandy substrates, often between boulders and pebbles, in fast-flowing rivers and streams. It requires cool, well-oxygenated soft water free of pollution or turbidity. The mussel spends its larval, or glochidial, stage attached to the gills of Salmonid fishes. This species does not reach reproductive maturity until at least 12 years old and may live for over 120 years, therefore population age-structure is vitally important when assessing viability. This species has undergone severe population decline and, in many cases, unable to reproduce because of poor water quality. An estimated 9.7 million adult mussels occur in the 19 SAC designated for the protection of the species. This represents 89% of the national population. The overall conservation status of this species is considered to be Bad and Unfavourable.</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Suir SAC, as per the Lower River Shannon SAC (NPWS, 2012)</p>	<p>The detailed Attributes and Targets for this Conservation Objective (NPWS, 2012) were reviewed as part of the Screening process.</p>		<p>No Likely Significant Effect – Given the distance between the Greenway and Freshwater Pearl Mussel, the Greenway would not be likely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.</p>	
<p>White-clawed Crayfish (<i>Austropotamobius pallipes</i>) [1092]</p>	<p>At least 12km upstream in the nearest freshwater river in the SAC, the Clodaigh River.</p>	<p>The White-clawed Crayfish is a large, long-lived freshwater crustacean. In other parts of Europe, it is mostly found in first-order streams. In Ireland, however, it has a wider habitat range, occurring in lakes, large rivers, streams and drains. The species is generally associated with good water quality, but it can occur at values as low as Q3. It prefers cool waters with adequate dissolved oxygen and lime, though tolerating significant fluctuations in these. Habitat heterogeneity accommodating this species' ontogeny has been identified as key to its persistence. It is highly vulnerable to aphanomycosis or "crayfish plague" caused by the oomycete <i>Aphanomyces astaci</i>, a major vector of which is the American signal crayfish (<i>Pacifastacus leniusculus</i>). Ireland is a potential ark site for the conservation of White-clawed Crayfish due to low instance of aphanomycosis and being the only European country free of invasive crayfish. 15 SACs are designated for this species in the Member State, though it is not present in 2 of those and there are a further 17 SACs in which this species occurs but is not listed as a Qualifying Interest. The overall conservation status of the species is considered Inadequate but "stable", with major pressures/threats including disease and invasive species.</p>	<p>No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.</p>	<p>To maintain the favourable conservation condition of White-clawed Crayfish in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)</p>	<p>The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.</p>		<p>No Likely Significant Effect – Given the distance between the Greenway and White-clawed Crayfish, the Greenway would be unlikely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.</p>	
<p>Sea Lamprey (<i>Petromyzon marinus</i>) [1095]</p>	<p>100 m west of the Greenway in the River Suir.</p>	<p>The Sea lamprey is a primitive anadromous fish species. Adults live at sea as external parasites on host fish. Migration to freshwater occurs in spring and spawning in June/July. Hatching of ammocoetes takes place within days and the immature lamprey swims or drifts downstream until it encounters an area of fine sediment into which it can burrow. Transformation to the adult stage occurs in late summer and young adults migrate downriver in late autumn/winter. Barriers to migration are seen as major negative impacts on this species. 12 SACs are designated for this species in the Member State. Population size within the Lower River Suir SAC is not determined. However, King (2006) suggests a lower abundance and distribution compared to other main river systems and notes that barriers to suitable habitat further up the catchment may be a limitation on this population. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including canalisation and barriers to migration.</p>	<p>Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.</p>	<p>To restore the favourable conservation condition of Sea Lamprey in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)</p>	<p>Distribution: extent of anadromy</p>	<p>Greater than 75% of main stem length of rivers accessible from estuary</p>	<p>No LSE – There will be no alteration in the range of subcommunities as a result of the Greenway.</p>	
						<p>Population structure of juveniles</p>	<p>At least three age/size groups present</p>	<p>No LSE – There will be no expansion of common cordgrass as a result of the Greenway as no works will be undertaken in areas containing common cordgrass.</p>
						<p>Juvenile density in fine sediment</p>	<p>Juvenile density at least 1 m⁻²</p>	<p>No LSE – There will be no impact on juvenile density as a result of the Greenway.</p>
						<p>Extent and distribution of spawning habitat</p>	<p>No decline in extent and distribution of spawning beds</p>	<p>No LSE – There will be no spawning habitat impacted upon by the Greenway.</p>
						<p>Availability of juvenile habitat</p>	<p>More than 50% of sample sites positive</p>	<p>No LSE – There will be no impact on juvenile habitat availability as a result of the Greenway.</p>
						<p>Water quality and chemistry: suspended sediments and nutrients</p>	<p>The concentration of sediments and nutrients in the water column must be sufficiently low to prevent changes in species composition or habitat condition</p>	<p>No LSE – The Greenway is unlikely to affect suspended sediments and nutrients. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.</p>

					Vegetation composition: typical species	Typical species of the relevant habitat sub-type reach favourable status	No LSE –The Greenway will not affect vegetation composition in terms of typical species.
					Floodplain connectivity: area	The area of active floodplain at and upstream of the habitat must be maintained	No LSE –The Greenway will not impact the area of active floodplain.
Brook Lamprey (<i>Lampetra planeri</i>) [1096]	At least 12km upstream in the nearest freshwater river in the SAC, the Clodaigh River.	The Brook lamprey is the smallest of the three lampreys recorded in Ireland. It is non-parasitic and non-migratory as an adult, living its entire life in freshwater. Adults spawn in spring and, after hatching, the ammocoetes drift or swim downstream before encountering areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn and die. 10 SACs are designated for this species in the Member State. Population size within the Lower River Suir SAC is not determined. The overall conservation status of the species is considered Favourable, with main pressures/threats including dredging and removal of sediments.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To restore the favourable conservation condition of Brook Lamprey in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Brook Lamprey, the Greenway would be unlikely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the Lower River Suir SAC.
River Lamprey (<i>Lampetra fluviatilis</i>) [1099]	100 m west of the Greenway in the River Suir.	The River and Brook lamprey are indistinguishable as larvae, living as filter feeders in sediment. The mature adult forms are clearly distinguishable on the basis of body size. 10 SACs are designated for this species in the Member State. Major pressures/threats to River lamprey include both diffuse and point-source pollution, invasive species, dredging and barriers to migration. The overall conservation status of the species is considered to be Favourable	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of River Lamprey in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	No LSE – The Greenway is unlikely to affect suspended sediments and nutrients. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
					Population structure of juveniles	At least three age/size groups of River/ Brook Lamprey present	No LSE –The Greenway will not affect vegetation composition in terms of typical species as no in-stream works are taking place.
					Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2 per m ²	No LSE –The Greenway will not impact the area of active floodplain.
					Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place.
					Availability of juvenile habitat	More than 50% of sample sites positive	No LSE – There will be no impact on juvenile habitat availability as a result of the Greenway as no in-stream works are taking place.
Twaite Shad (<i>Alosa fallax</i>) [1103]	100 m west of the Greenway in the River Suir.	The Twaite Shad is a large anadromous member of the herring family living in the lower reaches of estuaries or at sea as adults, feeding on juvenile fish and on crustaceans. Adult fish travel upriver in Irish estuaries and spawn at the upper tidal reaches in a series of rivers in the southeast. Eggs are fertilised externally and either drop to the bed or float in the water column. The eggs hatch after a short period and young can reach up to 100 mm by the end of the first year. Irish Twaite Shad may live in estuarine waters for at least 2 years before going to sea. 4 SACs are designated for this species in the Member State. The only known spawning location of Twaite Shad occurs in the Barrow north of St Mullins (Doherty <i>et al.</i> , 2004). A habitat survey at the spawning area on the R. Barrow in 2010 indicated a wide range	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Twaite Shad in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No LSE – The Greenway is unlikely to affect suspended sediments and nutrients. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
					Population structure: age class	More than one age class present	No LSE – There will be no impact on population structure as a result of the Greenway as no in-stream works are taking place.

		of bed conditions including some areas with extensive filamentous algal cover, others with moss or other aquatic plants and further sites with a loosely-textured gravel-cobble bed. The information compiled since 2000 points to a strong annual spawning presence of Twaite Shad in the Barrow. The populations of Shad on the Barrow, are relatively stable, based on angling and post-larval surveys. It is suggested that in excess of 95% of the Irish population of Twaite Shad occurs within the SAC network designated for this species and that the current network is adequate and appropriate for the species, in the context of maintaining adequate conservation status. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including invasive species, fishing and inbreeding.			Extent and distribution of spawning habitat	No decline in extent and distribution of spawning habitat	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place.
					Water quality: oxygen levels	No lower than 5 mg/l	No LSE – There will be no impact on oxygen levels as a result of the Greenway. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
					Spawning habitat quality: Filamentous algae; macrophytes; sediment	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place.
Atlantic Salmon (<i>Salmo salar</i>) [1106]	100 m west of the Greenway in the River Suir.	The Atlantic salmon is an anadromous species indigenous to the North Atlantic. Salmon use rivers to reproduce and as nursery areas during their juvenile phase. Adults spend 1 to 3 years at sea where growth rates are much greater. The Irish population generally comprises fish that spend 2 winters in freshwater before going to sea in April-June. The majority of Irish fish spend 1 winter at sea before returning to their natal rivers, mainly during the summer. Smaller numbers spend 2 winters at sea, returning mainly in spring. A small proportion of the adult population returns to sea post-spawning and can spawn again. 26 SACs are designated for this species in the Member State, containing between c.97,643 and c.146,464 individuals of the national population of c.244,107. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning. The overall conservation status of the species is considered Inadequate but "stable", with major pressures/threats including agricultural intensification, disposal of household/recreational facility waste, poaching and pollution due to agriculture, forestry, household sewage and waste waters.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Atlantic Salmon in the Lower River Suir SAC, as per the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	No LSE – The Greenway is unlikely to affect suspended sediments and nutrients. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
					Adult spawning fish	Conservation Limit for each system consistently exceeded	No LSE – The Greenway is unlikely to impact the abundance of spawning adult fish as no in-stream works are taking place.
					Salmon fry abundance	Maintain or exceed 0+ fry mean catchment wide abundance threshold value	No LSE – The Greenway is unlikely to impact the abundance of small fry abundance as no in-stream works are taking place.
					Out-migrating smolt abundance	No significant decline	No LSE – The Greenway is unlikely to impact the abundance of out-migrating smolt as no in-stream works are taking place.
					Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic cause	No LSE – The Greenway is unlikely to impact the number and distribution of spawning redds as no in-stream works are taking place.
					Water quality	At least Q4 at all sites sampled by the EPA	No LSE – The Greenway is unlikely to affect the water quality. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
European Otter (<i>Lutra lutra</i>) [1355]	100 m west of the Greenway in and near the River Suir.	The Otter is a large carnivore with a long, slim body, short legs with webbed feet and a tapered tail. Adult males can reach 1 m in length and 10 kg in weight. 45 SACs are designated for this species in the Member State, containing 468–660 of the country's c. 7,218–10,186 breeding females. Population size within the Lower River Suir SAC was not determined in the last	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the	To restore the favourable conservation condition of European Otter in the Lower River Suir SAC, as per the River	Distribution	No significant decline	No LSE – The Greenway will not result in a decline in distribution.
					Extent of terrestrial, freshwater and marine habitat	No significant decline	No LSE – The Greenway will not result in a significant decline of terrestrial, freshwater or marine habitat.

	national survey (Reid <i>et al.</i> , 2013). The River Barrow is one of the more important river systems for Otter (Bailey & Rochford, 2006). The overall conservation status of the species is considered Favourable, with road mortalities constituting the major pressure at present (NPWS, 2009).	Qualifying Interest.	Barrow and River Nore SAC (NPWS, 2011)	Couching sites and holts	No significant decline	No LSE – The January 2016 survey did not identify any evidence of Otter breeding within 250 m of the Greenway. There will not likely be a significant loss of couching sites or holts within derogation limits of Greenway as a result of the Greenway.
				Fish biomass available	No significant decline	No LSE – The Greenway is unlikely to affect the availability of fish biomass. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
				Barriers to connectivity	No significant decline	No LSE – The Greenway will not result in a significant increase in barriers to connectivity. There is little evidence of disturbance to Otter as a result of recreation (NPWS, 2009) which is a potential hazard during the operational phase. The scale and nature of the Project coupled with the crepuscular nature of Otter means there will be no significant effect on Otter distribution within the SAC during construction or operation as a result of the Project. Generic best practice (NRA, 2008) will be employed to limit temporary disturbance during the construction phase.

Table 3. Screening Matrix for the River Barrow and River Nore SAC. Source: NPWS (2013), unless specifically referenced. * = a “priority habitat” in danger of disappearing from the EU. Numbers in square brackets are Natura 2000 codes.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
Estuaries [1130]	200m downstream of the Glenmore River Crossing.	The estuary is the downstream part of a river valley, subject to the tide and extending from the limit of brackish waters. River estuaries are coastal inlets where there is generally a significant freshwater influence. Muddy to sandy substrates are the most common estuarine substrates in an Irish context and this reflected in the biological communities occurring. 19 SACs are designated for Estuaries in the Member State. It is estimated that a total of 67,400 ha of 1130 occurs within the Natura 2000 network. This habitat forms c. 20% (2,474.63 ha) of the River Barrow and River Nore SAC, equivalent to c. 3.7% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate and “improving”. The major pressures on Irish estuaries include pollution to surface waters, fishing and harvesting of aquatic resources and bottom culture.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	The permanent habitat area is stable or increasing, subject to natural processes.	No LSE- There will be no reduction in habitat area as a result of the Greenway.
					Community Distribution	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with <i>Fabulina fabula</i> community.	No LSE – There will be no reduction in the natural sediment communities as a result of the Greenway.
					Community Extent	Maintain the natural extent of the <i>Sabellaria alveolata</i> reef, subject to natural process.	No LSE – There will be no reduction in the natural extent of the <i>Sabellaria</i> reef as a result of the Greenway.
Mudflats and sandflats not covered by seawater at low tide [1140]	200m downstream of the Glenmore River Crossing	This habitat is found exclusively between the low water and mean high water marks. It is often part of the Annex I habitats Large shallow and bay and Estuaries but can occur independently. The fine sediment of intertidal mudflats is most often associated with rivers. Biological communities found in this habitat are very similar to those found in estuaries (above). 42 SACs are designated for Tidal mudflats in the Member State. It is estimated that a total of 53,700 ha of the habitat type occurs within the Natura 2000 network. This habitat forms c. 4.0% (494.93 ha) of the River Barrow and River Nore SAC, equivalent to c. 0.9% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate but “improving”. The major pressures on this habitat include pollution to surface waters, fishing and harvesting of aquatic resources and bottom culture.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To maintain the favourable conservation condition of the Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	The permanent habitat area is stable or increasing, subject to natural processes.	No LSE- There will be no reduction in habitat area as a result of the Greenway.
					Community Distribution	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex.	No LSE – There will be no reduction in the natural sediment communities as a result of the Greenway.
<i>Salicornia</i> and other annuals colonizing mud and sand [1310]	200m downstream of the Glenmore River Crossing.	<i>Salicornia</i> mud is a pioneer saltmarsh community that may occur on muddy sediment seaward of established saltmarsh, or form patches within other saltmarsh communities where the elevation is suitable and there is regular tidal inundation. In Ireland, three sub-types are recognised: <i>Salicornia</i> type, <i>Suaeda</i> type and the much rarer <i>Sagina</i> type. Mono-specific swards of <i>Salicornia</i> spp. growing on muddy sediments are the most common plant community belonging to this Annex I habitat type found in Ireland. As this habitat is dominated by annuals it can be ephemeral or transient in nature and is highly susceptible to erosion. Its distribution can vary considerably from year to year and it can move in response to changing conditions, e.g. in estuaries with shifting river channels. 23 SACs are designated for <i>Salicornia</i> mud in the Member State. It is estimated that a total of 170–183 ha of this habitat occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the River Barrow and River Nore SAC, equivalent to c.67.6–72.8% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To maintain the favourable conservation condition of <i>Salicornia</i> and other annuals colonizing mud and sand in the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	Area stable or increasing, subject to natural processes, including erosion and succession.	No LSE – There will be no reduction in habitat area as a result of the Greenway as no works are to be undertaken within this habitat.
					Habitat Distribution	No decline, subject to natural processes.	No LSE – There will be no reduction in habitat distribution as a result of the Greenway.
					Physical Structure: sediment supply	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions.	No LSE – There will be no alteration in sediment supply as a result of the Greenway.
					Physical Structure: flooding regime	Maintain natural tidal regime.	No LSE – There will be no alteration in creek and pan structure as a result of the Greenway.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
		Inadequate and “declining”, owing to pressures and threats such as invasive species, intensive grazing, pollution and changes in abiotic conditions.			Physical structure: creeks and pans	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.	No LSE – There will be no alteration in the tidal regime as a result of the Greenway.
					Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	No LSE – There will be no alteration in the range of coastal habitats as a result of the Greenway.
					Vegetation structure: vegetation height	Maintain structural variation within sward.	No LSE – There will be no alteration in the structural variation as a result of the Greenway.
					Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated.	No LSE – There will be no alteration in vegetation cover as a result of the Greenway.
					Vegetation composition: typical species and sub communities	Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Greenway (McCorry and Ryle, 2009).	No LSE – There will be no alteration in the range of subcommunities as a result of the Greenway.
					Vegetation Structure: negative indicator species <i>Spartina anglica</i>	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%.	No LSE- There will be no significant expansion of common cordgrass as a result of the Greenway.
Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330]	200m downstream of the Glenmore River Crossing	Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient. They exhibit a distinctive topography with an intricate network of creeks and salt pans occurring on the larger marshes. This habitat contains several distinctive zones that are related to elevation and frequency of submergence. The lowest part along the tidal zone is generally dominated by common saltmarsh-grass (<i>Puccinellia maritima</i>). This habitat is also important for other wildlife including wintering waders and wildfowl. Atlantic salt meadows are distributed around most of the coastline of Ireland. 38 SACs are designated for Atlantic salt meadows in the Member State. It is estimated that a total of 1,479–2,590 ha of this habitat occurs within the Natura 2000 network. This habitat forms c. 1% (123.73 ha) of the River Barrow and River Nore SAC, equivalent to c.4.8–8.4% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate but “stable”, owing to pressures and threats such as intensive grazing and paths/tracks and cycling tracks.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	Area stable or increasing, subject to natural processes, including erosion and succession.	No LSE – There will be no reduction in habitat area as a result of the Greenway as no works are to be undertaken within this habitat.
					Habitat Distribution	No decline, or change in habitat distribution, subject to natural processes.	No LSE – There will be no reduction in habitat distribution as a result of the Greenway.
					Physical Structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No LSE – There will be no alteration in sediment supply as a result of the Greenway.
					Physical structure: creeks and pans	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	No LSE – There will be no alteration in creek and pan structure as a result of the Greenway.
					Physical Structure: flooding regime	Maintain natural tidal regime	No LSE – There will be no alteration in the tidal regime as a result of the Greenway.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
					Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	No LSE – There will be no alteration in the range of coastal habitats as a result of the Greenway.
					Vegetation structure: vegetation height	Maintain structural variation within sward	No LSE – There will be no alteration in the structural variation as a result of the Greenway.
					Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	No LSE – There will be no alteration in vegetation cover as a result of the Greenway.
					Vegetation composition: typical species and sub communities	Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Greenway (McCorry and Ryle, 2009)	No LSE – There will be no alteration in the range of subcommunities as a result of the Greenway.
					Vegetation Structure: negative indicator species <i>Spartina anglica</i>	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of < 1%	No LSE – There will be no expansion of common cordgrass as a result of the Greenway.
Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	200m downstream of the Glenmore River Crossing	Mediterranean salt meadows occupy the upper zone of saltmarshes and usually occur adjacent to the boundary with terrestrial habitats. They are widespread on the Irish coastline but are not as extensive as Atlantic salt meadows. The habitat is distinguished from Atlantic salt meadows by the presence of rushes such as sea rush (<i>Juncus maritimus</i>) and/or sharp rush (<i>J. acutus</i>), along with a range of species typically found in Atlantic salt meadows, including sea aster (<i>Aster tripolium</i>), sea purslane (<i>Atriplex portulacoides</i>), sea-milkwort (<i>Glaux maritima</i>), saltmarsh rush (<i>J. gerardii</i>), parsley water-dropwort (<i>Oenanthe lachenalii</i>), sea plantain (<i>Plantago maritima</i>) and common saltmarsh-grass (<i>Puccinellia maritima</i>). 33 SACs are designated for this habitat type in the Member State. It is estimated that a total of 577–591 ha of Mediterranean salt meadows occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the River Barrow and River Nore SAC, equivalent to c.21% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate but “stable”, owing to pressures and threats such as intensive cattle grazing and walking/cycling tracks.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC (NPWS, 2011)	Habitat Area	Area stable or increasing, subject to natural processes, including erosion and succession.	No LSE – There will be no reduction in habitat area as a result of the Greenway as no works are to be undertaken within this habitat.
					Habitat Distribution	No decline, or change in habitat distribution, subject to natural processes.	No LSE – There will be no reduction in habitat distribution as a result of the Greenway.
					Physical Structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	No LSE – There will be no alteration in sediment supply as a result of the Greenway.
					Physical structure: creeks and pans	Maintain creek and pan structure, subject to natural processes, including erosion and succession	No LSE – There will be no alteration in creek and pan structure as a result of the Greenway.
					Physical Structure: flooding regime	Maintain natural tidal regime	No LSE – There will be no alteration in the tidal regime as a result of the Greenway.
					Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	No LSE – There will be no alteration in the range of coastal habitats as a result of the Greenway.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
					Vegetation structure: vegetation height	Maintain structural variation within sward	No LSE – There will be no alteration in the structural variation as a result of the Greenway.
					Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	No LSE – There will be no alteration in vegetation cover as a result of the Greenway.
Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	Above the tidal limit at Inistoige/ St. Mullins 10km upstream of the Greenway end at New Ross.	The description of this habitat type is broad, covering rivers from upland bryophyte and macroalgal-dominated stretches, to lowland depositing rivers with pondweeds and starworts. Selection of SACs for this habitat in Ireland has used this broad interpretation. 21 SACs are designated for Floating river vegetation in the Member State. It is estimated that a total of 3,246 ha of Floating river vegetation occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the River Barrow and River Nore SAC, equivalent to c.3.8% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Inadequate and “declining” due to numerous pressures, including pollution from agricultural, forestry and industrial sources, as well as modification of hydrological regimes.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260], the Greenway would not be likely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
European dry heaths [4030]	Dry heath at the site occurs in pockets along Barrow Valley foothills of the Blackstairs Mountains 10km north of the Greenway	Dry heaths comprise vegetation dominated by ericaceous dwarf shrubs and usually occur on well-drained, nutrient-poor and acidic mineral soils or shallow peats on sloping ground (typically less than 50 cm deep). <i>Calluna vulgaris</i> is usually the main species but <i>Erica cinerea</i> , <i>Ulex gallii</i> and <i>Vaccinium myrtillus</i> may also be important components. Dry heaths occur from sea level up to around 400 m. 48 SACs are designated for Dry heaths in the Member State. It is estimated that a total of 63,074 ha of Dry heaths occurs within the Natura 2000 network. This habitat forms c.1% (123.73 ha) of the River Barrow and River Nore SAC, equivalent to c.0.2% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Bad but “stable”. Pressures acting on this habitat include burning and sheep grazing.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and European dry heaths, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Above the tidal limit at Inistoige/ St. Mullins 10km upstream of the Greenway end at New Ross.	Three distinct communities can be considered for this habitat in Ireland. In the lowlands, it occurs as a community of watercourses, particularly unmanaged edges of slow-moving rivers and the margins of lakes. Nutrient levels may be naturally high. The community is dominated by tall hydrophilous herbs and horsetails (<i>Equisetum</i> spp.) are a common feature, but monospecific stands are not including Reed beds, large sedge swamps, large areas of fallow wet meadow are excluded from the classification.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Petrifying springs with tufa formation (<i>Cratoneurion</i>)* [7220]	Petrifying springs with tufa formations occur at Dysart Wood along the River Nore 5 km upstream from the Greenway.	Tufa formation is associated with hard-water springs, where groundwater rich in calcium bicarbonate comes to the surface. On contact with the air, carbon dioxide is lost from the water and a hard deposit of calcium carbonate (tufa) is formed. 19 SACs are designated for Petrifying springs in the Member State. It is estimated a total of 11.4ha of Petrifying spring occurs within the Natura 2000 network. The exact area of this priority habitat and an equivalent estimate of the entire national Natura 2000 contribution within the SAC for this Qualifying Interest is not known.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of Petrifying springs with tufa formation (<i>Cratoneurion</i>) in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Petrifying springs with tufa formation (<i>Cratoneurion</i>), the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	30 km north of the Greenway at Borris Demense.	Best examples of old oak woodlands on the Barrow occur at Cloghristic Wood, Drummond Wood and Borris Demesne. Old oak woodlands are defined in the interpretation manual of EU habitats as "acidophilous <i>Quercus petraea</i> woods, with low, low-branched, trees, with many ferns, mosses, lichens and evergreen bushes". 40 SACs are designated for this habitat type in the Member State and it is estimated that a total of 3,899 ha of the habitat type occurs within the Natura 2000 network. This habitat forms c. 1.0% (123.73 ha) of the SAC, equivalent to c.3.1 % of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Bad but "improving".	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To restore the favourable conservation condition of Old oak woods with <i>Ilex</i> and <i>Blechnum</i> in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Old oak woods with <i>Ilex</i> and <i>Blechnum</i> , the Greenway would not be likely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)* [91E0]	Above the tidal limit at Inistoige/ St. Mullins 10km upstream of the Greenway end at New Ross.	Residual alluvial forests occur on heavy soils that are periodically inundated by the annual rise of river levels, but which are otherwise well drained and aerated during low water. 25 SACs are designated for this habitat type in the Member State. It is estimated that a total of 1,046 ha of 91E0 occurs within the Natura 2000 network. This habitat forms c. 1.0% (123.73ha) of the SAC, equivalent to c. 11.82% of the entire national Natura 2000 contribution for this Qualifying Interest. The overall conservation status of this habitat is considered to be Bad but "improving".	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the type of impacts likely to arise from the Greenway and the sensitivities of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>), the Greenway would be unlikely to compromise the restoration of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Desmoulin's Whorl Snail (<i>Vertigo moulinsiana</i>) [1016]	30 km upstream of the Greenway at Borris, River Barrow.	Desmoulin's whorl snail <i>Vertigo moulinsiana</i> is the largest <i>Vertigo</i> species, with a shell height up to about 2.6 mm. It is restricted to calcareous wetlands, usually bordering lakes or rivers, or in fens. 7 SACs are designated for this species within the Member State. Population size cannot be estimated for <i>Vertigo</i> snails so the NPWS approach is to use area of habitat as a surrogate measure. National habitat cover for this species is estimated between 24 and 28 ha. Moorkens (2011) estimated the area of habitat at the Borris site as c. 1.13 ha. A previous study of this SAC was found to have an unfavourable extent of optimal habitat for <i>V. moulinsiana</i> (Moorkens, 2007).	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of Desmoulin's Whorl Snail in the River Barrow and River Nore SAC	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Desmoulin's Whorl Snail, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029]	Above the tidal limit at Inistoige/ St. Mullins 10km upstream of the Greenway end at New Ross.	The Freshwater pearl mussel <i>Margaritifera margaritifera</i> grows to 140 mm in length, and burrows into sandy substrates, often between boulders and pebbles, in fast-flowing rivers and streams. It requires cool, well-oxygenated soft water free of pollution or turbidity. The mussel spends its larval, or glochidial, stage attached to the gills of Salmonid fishes. This species does not reach reproductive maturity until at least 12 years old and may live for over 120 years, therefore population age-structure is vitally important when assessing viability. This species has undergone severe population decline and, in many cases, unable to reproduce because of poor water quality. An estimated 9.7 million adult mussels occur in the 19 SAC designated for the protection of the species. This represents 89% of the national population. The overall conservation status of this species is considered to be Bad and Unfavourable.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	The status of Freshwater Pearl Mussel as a Qualifying Interest of the River Barrow and River Nore SAC is under review; a site-specific Conservation Objective has not yet been set for this Qualifying Interest	The definition of favourable conservation condition in respect of species, as given in Section 3.3 above, was considered in the Screening process with regard to this Qualifying Interest.		No Likely Significant Effect – Given the distance between the Greenway and Freshwater Pearl Mussel, the Greenway would not be likely to compromise the generic Conservation Objective for species within SACs with respect to this Qualifying Interest.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
White-clawed Crayfish (<i>Austropotamobius pallipes</i>) [1092]	4km upstream of the Greenway at Graignamanagh.	The White-clawed crayfish is a large, long-lived freshwater crustacean. In other parts of Europe, it is mostly found in first-order streams. In Ireland, however, it has a wider habitat range, occurring in lakes, large rivers, streams and drains. The species is generally associated with good water quality, but it can occur at values as low as Q3. It prefers cool waters with adequate dissolved oxygen and lime, though tolerating significant fluctuations in these. Habitat heterogeneity accommodating this species' ontogeny has been identified as key to its persistence. It is highly vulnerable to aphanomycosis or "crayfish plague" caused by the oomycete <i>Aphanomyces astaci</i> , a major vector of which is the American signal crayfish. Ireland is a potential ark site for the conservation of white-clawed crayfish due to low instance of aphanomycosis and being the only European country free of invasive crayfish. 15 SACs are designated for this species in the Member State, though it is not present in 2 of those and there are a further 17 SACs in which this species occurs but is not listed as a Qualifying Interest. Population size within the River Barrow and River Nore SAC is not determined, nonetheless considered to be of important for the conservation of White-clawed crayfish. The overall conservation status of the species is considered Inadequate but "stable", with major pressures/threats including disease and invasive species.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of White-clawed Crayfish in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and White-clawed Crayfish, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest in the River Barrow and River Nore SAC.
Sea Lamprey (<i>Petromyzon marinus</i>) [1095]	250 m; recorded in close proximity to New Ross (King, 2004)	The Sea lamprey is a primitive anadromous fish species. Adults live at sea as external parasites on host fish. Migration to freshwater occurs in spring and spawning in June/July. Hatching of ammocoetes takes place within days and the immature lamprey swims or drifts downstream until it encounters an area of fine sediment into which it can burrow. Transformation to the adult stage occurs in late summer and young adults migrate downriver in late autumn/winter. Barriers to migration are seen as major negative impacts on this species. 12 SACs are designated for this species in the Member State. Population size within the River Barrow and River Nore SAC is not determined. However, King (2006) suggests a lower abundance and distribution compared to other main river systems and notes that barriers to suitable habitat further up the catchment may be a limitation on this population. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including canalisation and barriers to migration.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest	To restore the favourable conservation condition of Sea Lamprey in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No LSE – There will be no additional barrier to migration as a result of the Greenway as no in-stream works are taking place.
					Population structure of juveniles	At least three age/size groups present	No LSE – There will be no impact on population structure as a result of the Greenway as no in-stream works are taking place.
					Juvenile density in fine sediment	Juvenile density at least 1 m ⁻²	No LSE – There will be no impact on juvenile density as a result of the Greenway as no in-stream works are taking place.
					Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place.
					Availability of juvenile habitat	More than 50% of sample sites positive	No LSE – There will be no impact on juvenile habitat availability as a result of the Greenway as no in-stream works are taking place.
Brook Lamprey (<i>Lampetra planeri</i>) [1096]	250 m; recorded in close proximity to New Ross (King, 2004)	The Brook lamprey is the smallest of the three lampreys recorded in Ireland. It is non-parasitic and non-migratory as an adult, living its entire life in freshwater. Adults spawn in spring and, after hatching, the ammocoetes drift or swim downstream before encountering areas of river bed with a fine silt composition. They burrow into this bed material and live as filter feeders over a period of years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn and die. 10 SACs are designated for this species in the Member State. Population size within the River Barrow and River Nore SAC is not determined. The overall conservation status of the species is considered Favourable, with main pressures/threats including dredging and removal of sediments.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Brook Lamprey in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution	Access to all watercourses down to first order streams	No LSE – There will be no additional barrier to migration as a result of the Greenway as no in-stream works are taking place.
					Population structure of juveniles	At least three age/size groups of Brook/River Lamprey present	No LSE – There will be no impact on population structure as a result of the Greenway as no in-stream works are taking place.
					Juvenile density in fine sediment	Mean catchment juvenile density of Brook/River Lamprey at least 2 m ⁻²	No LSE – There will be no impact on juvenile density as a result of the Greenway as no in-stream works are taking place.
					Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place..

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
					Availability of juvenile habitat	More than 50% of sample sites positive	No LSE – There will be no impact on juvenile habitat availability as a result of the Greenway as no in-stream works are taking place.
					Habitat quality: heterogeneity	No decline in heterogeneity or habitat quality	No LSE – The Greenway will not have any significant effect on the heterogeneity or habitat quality as no in-stream works are taking place.
River Lamprey (<i>Lampetra fluviatilis</i>) [1099]		The River and Brook lamprey are indistinguishable as larvae, living as filter feeders in sediment. The mature adult forms are clearly distinguishable on the basis of body size. 10 SACs are designated for this species in the Member State. Major pressures/threats to River lamprey include both diffuse and point-source pollution, invasive species, dredging and barriers to migration. The overall conservation status of the species is considered to be Favourable	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of River Lamprey in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	No LSE – There will be no additional barrier to migration as a result of the Greenway as no in-stream works are taking place.
					Population structure of juveniles	At least three age/size groups of River/Brook Lamprey present	No LSE – There will be no impact on population structure as a result of the Greenway as no in-stream works are taking place.
					Juvenile density in fine sediment	Mean catchment juvenile density of Brook/River Lamprey at least 2 m ⁻²	No LSE – There will be no impact on juvenile density as a result of the Greenway as no in-stream works are taking place.
					Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	No LSE – There will be no spawning habitat impacted upon by the Greenway as no in-stream works are taking place.
					Availability of juvenile habitat	More than 50% of sample sites positive	No LSE – There will be no impact on juvenile habitat availability as a result of the Greenway as no in-stream works are taking place.
					Water quality	At least Q4 at all sites sampled by EPA	No LSE – There will be no reduction in water quality resulting from the Greenway.
Twaite Shad (<i>Alosa fallax</i>) [1103]	250m to the east of the Greenway in the River Barrow	The Twaite Shad is a large anadromous member of the herring family living in the lower reaches of estuaries or at sea as adults, feeding on juvenile fish and on crustaceans. Adult fish travel upriver in Irish estuaries and spawn at the upper tidal reaches in a series of rivers in the southeast. Eggs are fertilised externally and either drop to the bed or float in the water column. The eggs hatch after a short period and young can reach up to 100 mm by the end of the first year. Irish Twaite Shad may live in estuarine waters for at least 2 years before going to sea. 4 SACs are designated for this species in the Member State. The only known spawning location of Twaite Shad occurs in the Barrow north of St Mullins (Doherty <i>et al.</i> , 2004). A habitat survey at the spawning area on the R. Barrow in 2010 indicated a wide range of bed conditions including some areas with extensive filamentous algal cover, others with moss or other aquatic plants and further sites with a loosely-textured gravel-cobble bed. The information compiled since 2000 points to a strong annual spawning presence of Twaite Shad in the Barrow. The populations of Shad on the Barrow, are relatively stable, based on angling and post-larval surveys. It is suggested that in excess of 95% of the Irish population of Twaite Shad occurs within the SAC network designated for this species and that the current network is adequate and appropriate for the species, in the	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Twaite Shad in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	No LSE – There will be no additional barrier to migration as a result of the Greenway as no in-stream works are taking place.
					Population structure: age classes	More than one age class present	No LSE – The Greenway will not result in any direct impacts on the age classes present as no in-stream works are taking place.
					Extent and distribution of spawning habitat	No decline in extent and distribution of spawning habitats	No LSE – The Greenway will not lead to any decline in extent or distribution of spawning habitat as no in-stream works are taking place.
					Water quality: oxygen levels	No lower than 5mg/l	No LSE – The Greenway will not affect water oxygen levels. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
		context of maintaining adequate conservation status. The overall conservation status of the species is considered Bad but "stable", with major pressures/threats including invasive species, fishing and inbreeding.			Spawning habitat quality: Filamentous algae; macrophytes; sediment	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	No LSE – The Greenway will not lead to any decline in spawning habitat quality as no in-stream works are taking place.
Atlantic Salmon (<i>Salmo salar</i>) [1106]	250m to the east of the Greenway in the River Barrow	The Atlantic salmon is an anadromous species indigenous to the North Atlantic. Salmon use rivers to reproduce and as nursery areas during their juvenile phase. Adults spend 1 to 3 years at sea where growth rates are much greater. The Irish population generally comprises fish that spend 2 winters in freshwater before going to sea in April-June. The majority of Irish fish spend 1 winter at sea before returning to their natal rivers, mainly during the summer. Smaller numbers spend 2 winters at sea, returning mainly in spring. A small proportion of the adult population returns to sea post-spawning and can spawn again. 26 SACs are designated for this species in the Member State, containing between c.97,643 and c.146,464 individuals of the national population of c.244,107. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning. The overall conservation status of the species is considered Inadequate but "stable", with major pressures/threats including agricultural intensification, disposal of household/recreational facility waste, poaching and pollution due to agriculture, forestry, household sewage and waste waters.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of Atlantic Salmon in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution: extent of anadromy	100% of river channels down to 2 nd order accessible from estuary	No LSE – There will be no additional barrier to migration as a result of the Greenway.
					Number of adult spawning fish	Conservation Limit for each system consistently exceeded	No LSE –The Greenway will not result in any direct impacts on adult spawning fish or the Conservation Limits as no in-stream works are taking place.
					Fry abundance	Maintain or exceed mean catchment-wide 0+ fry abundance threshold (17 fry per 5-min sample)	No LSE –The Greenway is very unlikely to impact mean catchment-wide fry abundance as no in-stream works are taking place.
					Smolt abundance	No significant decline	No LSE – The Greenway will very unlikely affect out-migrating smolt abundance as no in-stream works are taking place.
					Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	No LSE –The Greenway will not lead to any decline in the number or distribution of redds as no in-stream works are taking place.
					Water quality	At least Q4 at all sites sampled by EPA	No LSE – There will be no reduction in water quality resulting from the Greenway. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
European Otter (<i>Lutra lutra</i>) [1355]	Immediately adjacent to the Greenway in watercourses and riparian habitat.	The Otter is a large carnivore with a long, slim body, short legs with webbed feet and a tapered tail. Adult males can reach 1 m in length and 10 kg in weight.. 45 SACs are designated for this species in the Member State, containing 468–660 of the country's c. 7,218–10,186 breeding females. Population size within the River Barrow and River Nore SAC was not determined in the last national survey (Reid <i>et al.</i> , 2013). The River Barrow is one of the more important river systems for Otter (Bailey & Rochford, 2006). The overall conservation status of the species is considered Favourable, with road mortalities constituting the major pressure at present.	Yes – Given the proximity of the Greenway to this Qualifying Interest, potential pathways of risk are considered to exist between the Greenway and the Qualifying Interest.	To restore the favourable conservation condition of European Otter in the River Barrow and River Nore SAC (NPWS, 2011)	Distribution	No significant decline	No LSE – The Greenway will not result in a decline in distribution.
					Extent of terrestrial, freshwater and marine habitat.	No significant decline	No LSE – The Greenway will not result in a significant decline of terrestrial, freshwater or marine habitat.
					Couching sites and holts	No significant decline	No LSE – The January 2016 survey did not identify any evidence of Otter breeding within 250m of the Greenway. There will not likely be a significant loss of couching sites or holts within derogation limits of Greenway as a result of the Greenway.

Qualifying Interest	Closest proximity	Extent and character	Risk to this Qualifying Interest	Conservation Objective	Attribute	Target	Likely Significant Effect
					Fish biomass available	No significant decline	No LSE – The Greenway is unlikely to affect the availability of fish biomass. Appropriate site management adhering to generic best practice will ensure that there will be no change to water quality as a result of the Greenway.
					Barriers to connectivity	No significant decline	No LSE – The Greenway will not result in a significant increase in barriers to connectivity. No LSE – The Greenway will not result in a significant increase in barriers to connectivity. There is little evidence of disturbance to Otter as a result of recreation (NPWS, 2009) which is a potential hazard during the operational phase. The scale and nature of the Project coupled with the crepuscular nature of Otter means there will be no significant effect on Otter distribution within the SAC during construction or operation as a result of the Project. Generic best practice (NRA, 2008) will be employed to limit temporary disturbance during the construction phase.
Killarney Fern (<i>Trichomanes speciosum</i>) [1421]	10km upstream of the Greenway in Dysertmore.	Killarney fern <i>Trichomanes speciosum</i> is a medium-sized, long-lived fern with delicate, translucent fronds arising from a creeping rhizome. It is restricted to damp, shady and humid habitats and is extremely sensitive to desiccation. There are currently 64 extant populations in the Republic of Ireland, the majority being located in the south/south-west in County Kerry, Cork, Limerick, Tipperary and Waterford. There are 18 SACs designated for this species in the Member State. Of the 177 colonies where <i>Trichomanes speciosum</i> is known to occur, 153 (or 86.4%) are currently in SACs. Of the 24 that are not, 18 comprise gametophytes only. Killarney Fern occurs at only a few locations within the River Barrow and River Nore SAC. As there is no evidence of a decline in population size and the conservation status is assessed as Favourable.	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To maintain the favourable conservation condition of Killarney Fern in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Killarney Fern, the Greenway would not be likely to compromise the maintenance of the favourable conservation condition of this Qualifying Interest within the River Barrow and River Nore SAC.
Nore Pearl Mussel (<i>Margaritifera durrovensis</i>) [1990]	50km upstream in the River Nore.	This is the only site in the world for the hard-water form of the Freshwater Pearl Mussel, the Nore Pearl Mussel <i>M. durrovensis</i> (Moorkens & Costello, 1994).	No – The Qualifying Interest does not occur within the likely zone of impact of the Greenway. No pathway of risk thus exists between the Greenway and this Qualifying Interest, so potential impacts are not anticipated and are screened out.	To restore the favourable conservation condition of the Nore Pearl Mussel in the River Barrow and River Nore SAC (NPWS, 2011)	The detailed Attributes and Targets for this Conservation Objective (NPWS, 2011) were reviewed as part of the Screening process.		No Likely Significant Effect – Given the distance between the Greenway and Nore Pearl Mussel, the Greenway would not be likely to compromise the restoration of the favourable conservation condition of this Qualifying Interest within the River Barrow and River Nore SAC.

4.0 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

4.1 Assessment Criteria

The assessment questions listed below have been sourced from EC (2001):

Describe the individual elements of the Greenway (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site:

The Greenway will be constructed within a 5m wide construction envelope comprising of the route of the disused Waterford to New Ross Railway Line. Existing embankments and cutaways will be utilised along with the existing ballast to form the Greenway. All watercourses will be crossed on existing bridges and no in-stream works will take place. The Greenway is considered unlikely to give rise to any significant impacts on the Conservation Objectives of the Lower River Suir SAC, the River Barrow and River Nore SAC or any other Natura 2000 site.

Describe any likely direct, indirect or secondary impacts of the Greenway (either alone or in combination with other plans or projects) on the Natura 2000 site:

The construction phase of the Greenway will not be inconsistent with the Conservation Objectives nor will it have any direct impacts on the Qualifying Interests of the SACs. Generic best practice guidance (IFI, 2016; NRA, 2008) will be adhered to during construction phases, eliminating the risk of indirect impacts.

The operational phase of the Greenway will be of a scale and nature that will result in any pathways for direct or indirect impacts on the Qualifying Interests of the SACs. Guidelines followed during construction will reduce the probability of significant impacts from harmful surface water run-off. No lighting design is proposed for the Greenway outside of urban areas avoiding any potential secondary disturbance impacts to Otter.

Describe any likely significant changes to the site:

No element of the Greenway is likely to result in any change to any Annex I habitat, cause a reduction in the area of any Qualifying Interests within the Lower River Suir SAC or the River Barrow and River Nore SAC or cause any direct or indirect damage to the physical quality of the environment within the site.

Describe any likely impacts on the Natura 2000 site as a whole:

The Greenway will not involve any land-take within the Lower River Suir SAC or the River Barrow and River Nore SAC. There will be no impacts at the crossing points over the River Barrow and River Nore SAC. The potential for abiotic impacts as a result of the Greenway were assessed (Table 3) and it was deemed that following generic best practice (IFI, 2016), there would be no impacts on the watercourses. No element of the Greenway will cause direct or indirect damage to the size or characteristics of the SACs, nor will any element of the Greenway interfere with any known mitigation measures currently in place for other plans and projects.

Provide indicators of significance as a result of the identification of the effects above:

Taking into consideration the scale of the Greenway and the Qualifying Interests for which the Lower River Suir SAC and the River Barrow and River Nore SAC are designated, significant effects on these habitats are highly unlikely or inconsequential. The short duration of works and low intensity of operation are unlikely to give rise to significant indirect or residual impacts on Qualifying Interests of the SACs.

Describe from the above those elements of the Greenway or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:

As part of this report three elements have been used to assess the likely significance of affects of the Greenway on the Qualifying Interests of the SACs: potential hazards and their probability and magnitude (SNH, 2006). The main hazards identified are the potential for accidental pollution of watercourses during construction and the disturbance to foraging and commuting Otter. The probability and magnitude of these hazards has been deemed as low based on the scale and nature of the Greenway and adherence to relevant best practice guidelines. No element of the Greenway will cause direct or indirect permanent damage to the size or characteristics of the Lower River Suir SAC or the River Barrow and River Nore SAC.

4.2 Potential Abiotic Changes

In addition to identification of the likely significant effects of the Greenway on the Lower River Suir SAC and the River Barrow and River Nore SAC, it was deemed prudent, considering that the River Suir and River Barrow and their tributaries constitute a major structural element of the site, to assess the possibility of any abiotic changes to watercourses that may arise as a result of the Greenway construction and operation. This assessment was undertaken following guidance set out by Scottish Natural Heritage (SNH) on dealing with proposals affecting freshwater SACs (SNH, 2006) and the results for the two watercourses affected by the Greenway are shown in Table 3 below.

Table 3. Likely direct and indirect effects of elements of a Greenway that could trigger progression to Stage 2: Appropriate Assessment. Modified from SNH (2006).

Direct effects	Lower River Suir	River Barrow
Will the qualifying feature be damaged, destroyed, altered or lost to any extent as a result of the Project?	Uncertain	Uncertain
Indirect effects	Lower River Suir	River Barrow
River flow		
Will the works affect the flow?	No	No
Will the velocity be changed or the flow diverted?	No	No
Will the quantity of water be affected?	No	No
Will the flow regime change so that the river responds more quickly?	No	No
Will summer flows be changed (altering water temperatures and oxygen levels) or will winter floods be altered?	No	No
Channel substrate		
Will the works affect the substrate?	No	No
Will there be physical damage/disturbance to the habitat structure?	No	No
Will the diversity of channel morphology be reduced?	No	No
Will the works affect the river sediments?	No	No
Will the works lead to changes in the nature of river bed sediments?	No	No
Water quality		
Will the works affect water quality?	No	No
Will oxygen levels be altered?	No	No
Will water chemistry be changed?	No	No
Is there additional risk of accidental pollution?*	Yes*	Yes*
Will the works increase the water turbidity?	No	No
Will water temperature be changed?	No	No

*Accidental risk can be minimised adhering to generic best practice, e.g. IFI (2016), which sets out main issues of concern in terms of construction, bridge and culvert related impacts and their prevention.

4.3 Consideration of Potential Cumulative Impacts

A key requirement of the Habitats Directive is to determine whether the Greenway is likely to have a significant effect when considered in combination with other plans and projects. The main driver for addressing plans in combination is to ensure that cumulative effects are captured. For example, the effects of a plan on water quality may be insignificant when considered alone, but when combined with the effects of increased pollution from other plans, may lead to significant adverse impacts on site integrity. To that end, the “in-combination test” is about addressing “cumulative effects”.

Determining which plans and projects to consider requires a pragmatic approach given the nature and scale of development; proximity to Natura 2000; and the potential pathways of risk. Current best practice and available guidance suggests a staged approach, as follows:

- if it can be clearly demonstrated that the plan will not result in any effects at all that are relevant to European site integrity, then the plan should proceed without considering the in-combination test requirement in the Screening further; or,
- if there are identified effects arising from the plan, even if they are perceived as minor and not likely to have a significant effect on the European site alone, then these effects must be considered in combination with the effects arising from other plans and projects.

Elements of the plan that have individually been screened out as having no or inconsequential effects on any European site or because those elements are too general in nature do not require an in-combination assessment since, clearly, they will either have no cumulative effects or cumulative effects cannot be identified.

In the case of the Waterford to New Ross Greenway, the Greenway does not provide for change which could lead to any conceivable effect on the structure and function of any European site. The AA Screening has not identified any aspect of the Greenway that, potentially acting directly or indirectly on Qualifying Interests, would undermine the COs for any European site. Therefore, an in-combination test is not required for the Greenway.

5.0 DISCUSSION AND CONCLUSION

On the basis of the Screening assessment and in applying the Precautionary Principle, indicators of significance show that there is no potential for short-term or long-term interference with the Lower River Suir SAC or the River Barrow and River Nore SAC or any other Natura 2000 site.

It has been concluded, in view of best scientific knowledge and in view of the Conservation Objectives of the Lower River Suir SAC and the River Barrow and River Nore SAC, that the construction and operation of the proposed Greenway, either on its own or in combination with other plans or projects, would not be likely to give rise to significant effects on the Qualifying Interests of either of those sites or any other European site for nature conservation.

Based on that conclusion, Roughan & O'Donovan advises Kilkenny County Council, as the competent authority in this case, that there is no requirement to undertake a Natura Impact Statement in respect of the proposed Greenway.

The rationale for such a conclusion has regard to the structure and function of features of interest at Natura 2000 sites, notably in this case that:

- No areas of habitat important for the survival of the Qualifying Interests within the Lower River Suir Special SAC, the River Barrow and River Nore SAC or any other Natura 2000 site will be modified, fragmented, destroyed or isolated; and,
- No potentially meaningful proportion of the Qualifying Interests of the Lower River Suir Special SAC, the River Barrow and River Nore SAC or any other Natura 2000 site may be impacted through loss, damage or deterioration in habitat quality.

It can be objectively concluded that there are not likely to be significant effects on the Lower River Suir Special SAC, the River Barrow and River Nore SAC or any other Natura 2000 site arising from the construction and operation of the Waterford to New Ross Greenway. In our opinion, the overall conclusion is that construction of the Greenway can be "*screened out*" and a Stage 2: Appropriate Assessment will not be required to inform the planning application for the proposed Greenway and the process may proceed under Part 8 of the Planning and Development Regulations, 2001 (as amended).

6.0 REFERENCES

- Chanin, P. (2003) Ecology of the European Otter. *Conserving Natura 2000 Rivers Ecology Series 10*, English Nature, Peterborough.
- DEHLG (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin.
- EA (2013) *The Knotweed Code of Practice: Managing Japanese knotweed on development sites*. Environment Agency (England), Bristol.
- EC (2000) *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*. Directorate-General for the Environment of the European Commission.
- EC (2001) *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*. Directorate-General for the Environment of the European Commission.
- Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.
- Hendry, K. & Cragg-Hine, D. (2003) Ecology of the Atlantic Salmon. *Conserving Natura 2000 Rivers Ecology Series 7*, English Nature, Peterborough.
- IFI (2016) *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*. Inland Fisheries Ireland, Dublin.
- Kelly, J., Maguire, C.M. & Cosgrove, P.J. (2008) *Best Practice Management Guidelines Japanese knotweed Fallopija japonica*. Prepared for the Northern Ireland Environment Agency and the National Parks & Wildlife Service as part of Invasive Species Ireland.
- Maitland, P.S. (2003) Ecology of the River, Brook and Sea Lamprey. *Conserving Natura 2000 Rivers Ecology Series 5*, English Nature, Peterborough.
- McCorry, M. (2007) *Saltmarsh Monitoring Project 2006 – Summary Report*. Unpublished report for the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- McCorry, M. & Ryle, T. (2009) *Saltmarsh Monitoring Project 2007–2008: Summary Report*. Unpublished report for the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- Moorkens, E.A. (1995) *Mapping of proposed SAC rivers for Margaritifera margaritifera. Volumes 1 & 2*. Unpublished report for the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- Moorkens, E.A. (2000) Conservation Management of the Freshwater Pearl Mussel *Margaritifera margaritifera*. Part 2: Water Quality Requirements. *Irish Wildlife Manuals 9*.
- NPWS (2009) *Threat Response Plan: Otter (2009-2011)*. National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.
- NPWS (2011) *Conservation Objectives for the River Barrow and River Nore SAC [002162]. Version 1.0*. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2012) *Conservation Objectives for the Lower River Shannon SAC [002165]. Version 1.0*. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2016) *Conservation Objectives for the Lower River Suir SAC [002137]. Generic Version 5.0*. National Parks & Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin.

NPWS (2010) *Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Department of Environment, Heritage and Local Government, Dublin.

NRA (2006) *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*. National Roads Authority, Dublin.

NRA (2010) *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*. National Roads Authority, Dublin.

Planning and Development Regulations, 2001 (as amended). *SI No. 600/2001*.

SNH (2006) *Guidance for Competent Authorities when dealing with proposals affecting SAC freshwater sites*. Scottish Natural Heritage, Perth.

APPENDIX A

NPWS Site Synopses & Conservation Objectives



Site Name: Lower River Suir SAC

Site Code: 002137

Lower River Suir SAC consists of the freshwater stretches of the River Suir immediately south of Thurles, the tidal stretches as far as the confluence with the Barrow/Nore immediately east of Cheekpoint in Co. Waterford, and many tributaries including the Clodiagh in Co. Waterford, the Lingaun, Anner, Nier, Tar, Aherlow, Multeen and Clodiagh in Co. Tipperary. The Suir and its tributaries flow through the counties of Tipperary, Kilkenny and Waterford.

Upstream of Waterford city, the swinging meanders of the Suir criss-cross the Devonian sandstone rim of hard rocks no less than three times as they leave the limestone-floored downfold below Carrick-on-Suir. In the vicinity of Carrick-on-Suir the river follows the limestone floor of the Carrick Syncline. Upstream of Clonmel the river and its tributaries traverse Upper Palaeozoic Rocks, mainly the Lower Carboniferous Viséan and Tournaisian. The freshwater stretches of the Clodiagh River in Co. Waterford traverse Silurian rocks, through narrow bands of Old Red Sandstone and Lower Avonian Shales, before reaching the carboniferous limestone close to its confluence with the Suir. The Aherlow River flows through a Carboniferous limestone valley, with outcrops of Old Red Sandstone forming the Galtee Mountains to the south and the Slievenamuck range to the north. Glacial deposits of sands and gravels are common along the valley bottom, flanking the present-day river course.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [6430] Hydrophilous Tall Herb Communities
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests*
- [91J0] Yew Woodlands*

- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1092] White-clawed Crayfish (*Austropotamobius pallipes*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)

[1103] Twaite Shad (<i>Alosa fallax</i>)
[1106] Atlantic Salmon (<i>Salmo salar</i>)
[1355] Otter (<i>Lutra lutra</i>)

Alluvial wet woodland is a declining habitat type in Europe as a result of drainage and reclamation. The best examples of this type of woodland in the site are found on the islands just below Carrick-on-Suir and at Fiddown Island. Species occurring here include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Osier (*S. viminalis*), with Yellow Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Pendulous Sedge (*Carex pendula*), Meadowsweet (*Filipendula ulmaria*) and Common Valerian (*Valeriana officinalis*). The terrain is littered with dead trunks and branches and intersected with small channels which carry small streams to the river. The bryophyte and lichen floras appear to be rich. A small plot is currently being coppiced and managed by the National Parks and Wildlife Service. In the drier areas species such as Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*) occur.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*).

Old oak woodlands are also of importance at the site. The best examples are seen in Portlaw Wood which lies on both sides of the Clodiagh River. On the south-facing side the stand is more open and the oaks (mainly Pedunculate Oak, *Quercus robur*) are well grown and spreading. Ivy (*Hedera helix*) and Bramble (*Rubus fruticosus* agg.) are common on the ground, indicating relatively high light conditions. Oak regeneration is dense, varying in age from 0-40 years and Holly (*Ilex aquifolium*) is fairly common but mostly quite young. Across the valley, by contrast, the trees are much more closely spaced and though taller, are poorly grown on average. There are no clearings; large oaks extend to the boundary wall. In the darker conditions, Ivy is much rarer and Holly much more frequent, forming a closed canopy in places. Oak regeneration is uncommon since there are as yet few natural clearings. The shallowness of the soil on the north-facing slope probably contributes to the poor tree growth there. The acid nature of the substrate has induced a 'mountain' type oakwood community to develop. The site is quite species-rich throughout, including an abundance of mosses, liverworts and lichens. The rare lichen *Lobaria pulmonaria*, an indicator of ancient woodlands, is found here.

Inchinquilib Wood consists of three small separate sloping blocks of woodland in a valley cut by the young Miltien River and its tributaries through acidic Old Red Sandstone and Silurian rocks. Two blocks, both with an eastern aspect, located to the north of the road, are predominantly of Sessile Oak (*Quercus petraea*) and Hazel, with Downy Birch (*Betula pubescens*), Ash and Holly. The ground flora is quite mixed with,

for example, Wood-sedge (*Carex sylvatica*), Bluebell (*Hyacinthoides non-scripta*), Primrose (*Primula vulgaris*), Wood-sorrel (*Oxalis acetosella*), Pignut (*Conopodium majus*) and Hard Fern (*Blechnum spicant*). The base poor nature of the underlying rock is to some extent masked by the overlying drift. The third block, to the south of the road, and with a northern aspect, is a similar although less mature mixture of Sessile Oak, Birch and Holly. Here the influence of the drift is more marked, with the occurrence of Wood Anemone (*Anemone nemorosa*) amongst the ground flora.

Two stands of Yew (*Taxus baccata*) woods, a rare habitat in Ireland and the E.U., occur within the site. These are on limestone ridges at Shanbally and Cahir Park. Both are in woods planted with non-native species, including conifers. However, the area at Cahir Park is fairly substantial in size and includes some relatively undisturbed patches of wood and some very old trees. Regeneration of the Yew trees is mostly poor, due to competition from species such as Sycamore (*Acer pseudoplatanus*) and, at Shanbally, due to heavy grazing by goats. Other native species which occur with the Yew trees include Ash, Pedunculate Oak, Hazel and Spindle (*Euonymus europaeus*). Future prospects for these Yew woods are good as the sites are proposed for restoration under a Coillte E.U. LIFE programme.

Floating river vegetation is evident in the freshwater stretches of the River Suir and along many of its tributaries. Typical species found include Canadian Pondweed (*Elodea canadensis*), water-milfoils (*Myriophyllum* spp.), Fennel Pondweed (*Potamogeton pectinatus*), Curled Pondweed (*P. crispus*), Perfoliate Pondweed (*P. perfoliatus*), Pond Water-crowfoot (*Ranunculus peltatus*), other crowfoots (*Ranunculus* spp.) and the moss *Fontinalis antipyretica*. At a couple of locations along the river Opposite-leaved Pondweed (*Groenlandia densa*) occurs. This species is protected under the Flora (Protection) Order, 1999.

The Aherlow River is fast flowing and mostly follows a natural unmodified river channel. Submerged vegetation includes the aquatic moss *Fontinalis antipyretica* and Stream Water-crowfoot (*R. pencillatus*), while shallow areas support species such as Reed Canary-grass (*Phalaris arundinacea*), Brooklime (*Veronica beccabunga*) and Water Mint (*Mentha aquatica*). The river bank is fringed in places with Alder (*Alnus glutinosa*) and willows (*Salix* spp.).

The Multeen River is fast flowing, mostly gravel-bottomed and appears to follow a natural unmodified river channel. Water-crowfoots occur in abundance and the aquatic moss *Fontinalis antipyretica* is also common. In sheltered shallows, species such as Water-cress (*Nasturtium officinale*) and water-starworts (*Callitriche* spp.) occur. The river channel is fringed for most of its length with Alder, Willow and a narrow strip of marshy vegetation.

Salt meadows occur below Waterford City in old meadows where the embankment is absent, or has been breached, and along the tidal stretches of some of the in-flowing rivers below Little Island. There are very narrow, non-continuous bands of this habitat along both banks. More extensive areas are also seen along the south bank at Ballynakill, the east side of Little Island, and in three large salt meadows

between Ballynakill and Cheekpoint. The Atlantic and Mediterranean sub-types are generally intermixed. The species list is extensive and includes Red Fescue (*Festuca rubra*), oraches (*Atriplex* spp.), Sea Aster (*Aster tripolium*), Sea Couch (*Elymus pycnanthus*), frequent Sea Milkwort (*Glaux maritima*), occasional Wild Celery (*Apium graveolens*), Parsley Water-dropwort (*Oenanthe lachenalii*), English Scurvygrass (*Cochlearia anglica*) and Sea Arrowgrass (*Triglochin maritima*). These species are more representative of the Atlantic sub-type of the habitat. Common Cord-grass (*Spartina anglica*), is rather frequent along the main channel edge and up the internal channels. The legally protected (Flora (Protection) Order, 1999) Meadow Barley (*Hordeum secalinum*) grows at the landward transition of the saltmarsh. Sea Rush (*Juncus maritimus*), an indicator of the Mediterranean salt meadows, also occurs.

Other habitats at the site include wet and dry grassland, marsh, reedswamp, improved grassland, coniferous plantations, deciduous woodland, scrub, tidal river, stony shore and mudflats. The most dominant habitat adjoining the river is improved grassland, although there are wet fields with species such as Yellow Iris, Meadowsweet, rushes (*Juncus* spp.), Meadow Buttercup (*Ranunculus acris*) and Cuckooflower (*Cardamine pratensis*).

Cabragh marshes, just below Thurles, lie in a low-lying tributary valley into which the main river floods in winter. Here there is an extensive area of Common Reed (*Phragmites australis*) with associated marshland and peaty fen. The transition between vegetation types is often well displayed. A number of wetland plants of interest occur, in particular the Narrow-leaved Bulrush (*Typha angustifolia*), Bottle Sedge (*Carex rostrata*) and Blunt-flowered Rush (*Juncus subnodulosus*). The marsh is naturally eutrophic but it has also the nutritional legacy of the former sugar factory which discharged into it through a number of holding lagoons, now removed. Production is high, which is seen in the size of such species as Celery-leaved Buttercup (*Ranunculus sceleratus*), as well as in the reeds themselves.

Throughout the Lower River Suir site are small areas of woodland other than those described above. These tend to be a mixture of native and non-native species, although there are some areas of semi-natural wet woodland with species such as Ash and willow. Cahir Park Woodlands is a narrow tract of mixed deciduous woodland lying on the flat-lying floodplain of the River Suir. This estate woodland was planted over one hundred years ago and it contains a large component of exotic tree species. However, due to original planting and natural regeneration there is now a good mix of native and exotic species. About 5 km north-west of Cashel, Ardmayle pond is a long, possibly artificial water body running parallel to the River Suir. It is partly shaded by planted Lime (*Tilia* hybrids), Sycamore and the native Alder. Growing beneath the trees are shade tolerant species such as Remote sedge (*Carex remota*).

The site is of particular conservation interest for the presence of a number of Annex II animal species, including Freshwater Pearl Mussel (both *Margaritifera margaritifera* and *M. margaritifera* subsp. *durrovensis* occur), White-clawed Crayfish, Salmon, Twaite Shad (*Alosa fallax fallax*), three species of Lampreys - Sea Lamprey, Brook

Lamprey and River Lamprey, and Otter. This is one of only three known spawning grounds in the country for Twaite Shad.

The site also supports populations of several other animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Natterer's Bat, Pipistrelle Bat, Pine Marten, Badger, Irish Hare, Smelt and Common Frog. Breeding stocks of Carp are found in Kilsheelan Lake. This is one of only two lakes in the country which is known to have supported breeding Carp. Carp require unusually high summer water temperatures to breed in Ireland. As the site is therefore unusual in this regard, it may also support interesting invertebrate populations.

Parts of the site have also been identified as of ornithological importance for a number of Annex I (E.U. Birds Directive) bird species, including Greenland White-fronted Goose (10), Golden Plover (1,490), Whooper Swan (7) and Kingfisher. Figures given in brackets are the average maximum counts from four count areas within the site for the three winters 1994-1997. Wintering populations of migratory birds use the site. Flocks are seen in Coolfinn Marsh and also along the reedbeds and saltmarsh areas of the Suir. Coolfinn supports nationally important numbers of Greylag Goose on a regular basis, with numbers between 600 and 700 recorded. Other species occurring include Mallard (21), Teal (159), Wigeon (26), Tufted Duck (60), Pintail (4), Pochard (2), Little Grebe (2), Black-tailed Godwit (20), Oystercatcher (16), Lapwing (993), Dunlin (101), Curlew (195), Redshank (28), Greenshank (4) and Green Sandpiper (1). Nationally important numbers of Lapwing (2,750) were recorded at Faithlegg in the winter of 1996/97. In Cabragh marshes there is abundant food for surface feeding wildfowl which total approximately 1,000 in winter. Widgeon, Teal and Mallard are numerous, and the latter has a large breeding population, with up to 400 in summer. In addition, less frequent species like Shoveler and Pintail occur and there are records for both Whooper and Bewick's swans. Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive, occurs along some of the many tributaries throughout the site.

Land use at the site consists mainly of agricultural activities including grazing, silage production, fertilising and land reclamation. The grassland is intensively managed and the rivers are therefore vulnerable to pollution from run-off of fertilisers and slurry. Arable crops are also grown. Fishing is a main tourist attraction on stretches of the Suir and some of its tributaries, and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. The Aherlow River is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other recreational activities such as boating, golfing and walking are also popular. Several industrial developments, which discharge into the river, border the site including three dairy related operations and a tannery.

The Lower River Suir contains excellent examples of a number of Annex I habitats, including the priority habitats alluvial forest and Yew woodland. The site also supports populations of several important animal species, some listed on Annex II of the Habitats Directive or listed in the Irish Red Data Book. The presence of two

legally protected plants (Flora (Protection) Order, 1999) and the ornithological importance of the site adds further to the ecological interest and importance.



Conservation objectives for Lower River Suir SAC [002137]

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:

Code	Description
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)*
91J0	<i>Taxus baccata</i> woods of the British Isles*

* denotes a priority habitat



Code	Common Name	Scientific Name
1029	Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>
1092	White-clawed Crayfish	<i>Austropotamobius pallipes</i>
1095	Sea Lamprey	<i>Petromyzon marinus</i>
1096	Brook Lamprey	<i>Lampetra planeri</i>
1099	River Lamprey	<i>Lampetra fluviatilis</i>
1103	Twaite Shad	<i>Alosa fallax fallax</i>
1106	Salmon	<i>Salmo salar</i>
1355	Otter	<i>Lutra lutra</i>

Citation: NPWS (2016) Conservation objectives for Lower River Suir SAC [002137]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Site Name: River Barrow and River Nore SAC

Site Code: 002162

This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King’s Rivers on the Nore.

Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1170] Reefs
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [4030] Dry Heath
- [6430] Hydrophilous Tall Herb Communities
- [7220] Petrifying Springs*
- [91A0] Old Oak Woodlands

[91E0] Alluvial Forests*

- [1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
- [1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
- [1092] White-clawed Crayfish (*Austropotamobius pallipes*)
- [1095] Sea Lamprey (*Petromyzon marinus*)
- [1096] Brook Lamprey (*Lampetra planeri*)
- [1099] River Lamprey (*Lampetra fluviatilis*)
- [1103] Twaite Shad (*Alosa fallax*)
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)
- [1421] Killarney Fern (*Trichomanes speciosum*)
- [1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)

Good examples of alluvial forest (a priority habitat on Annex I of the E.U. Habitats Directive) are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Crack Willow (*S. fragilis*) and Osier (*S. viminalis*), along with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*).

A good example of petrifying springs with tufa formations occurs at Dysart Wood along the Nore. This is a rare habitat in Ireland and one listed with priority status on Annex I of the E.U. Habitats Directive. These hard water springs are characterised by lime encrustations, often associated with small waterfalls. A rich bryophyte flora is typical of the habitat and two diagnostic species, *Palustriella commutata* and *Eucladium verticillatum*, have been recorded.

The best examples of old oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the 16th century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved

Bellflower and the moss *Leucodon sciuroides*. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

Oak woodland covers parts of the valley side south of Woodstock and is well developed at Brownsford where the Nore takes several sharp bends. The steep valley side is covered by oak (*Quercus* spp.), Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Downy Birch (*Betula pubescens*), with some Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). All the trees are regenerating through a cover of Bramble (*Rubus fruticosus* agg.), Foxglove (*Digitalis purpurea*), Great Wood-rush (*Luzula sylvatica*) and Broad Buckler-fern (*Dryopteris dilatata*).

On the steeply sloping banks of the River Nore, about 5 km west of New Ross, in Co. Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of relatively undisturbed, relict oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown, a small, mature oak dominated woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Common Cow-wheat (*Melampyrum pratense*) and Bracken (*Pteridium aquilinum*).

Borris Demesne contains a very good example of a semi-natural broadleaved woodland in very good condition. There is quite a high degree of natural regeneration of oak and Ash through the woodland. At the northern end of the estate oak species predominate. Drummond Wood, also on the Barrow, consists of three blocks of deciduous woods situated on steep slopes above the river. The deciduous trees are mostly oak species. The woods have a well-established understorey of Holly, and the herb layer is varied, with Bramble abundant. The whitebeam *Sorbus devoniensis* has also been recorded here.

Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*). Indian Balsam (*Impatiens glandulifera*), an introduced and invasive species, is abundant in places.

Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include water-starworts (*Callitriche* spp.), Canadian Pondweed (*Elodea canadensis*), Bulbous Rush (*Juncus bulbosus*), water-milfoils (*Myriophyllum* spp.), the pondweed *Potamogeton x nitens*, Broad-leaved Pondweed (*P. natans*), Fennel Pondweed (*P. pectinatus*), Perfoliated Pondweed (*P. perfoliatus*) and crowfoots (*Ranunculus* spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996).

Dry heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken and Gorse (*Ulex europaeus*) with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove, Common Sorrel (*Rumex acetosa*) and Creeping Bent (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry and Great Wood-rush are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of clover species, including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

Dry heath at the site generally grades into wet woodland or wet swamp vegetation lower down the slopes on the river bank. Close to the Blackstairs Mountains, in the foothills associated with the Aughnabriskey, Aughavaud and Mountain Rivers there are small patches of wet heath dominated by Purple Moor-grass (*Molinia caerulea*) with Heather, Tormentil (*Potentilla erecta*), Carnation Sedge (*Carex panicea*) and Bell Heather (*Erica cinerea*).

Salt meadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites australis*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) are found. The very rare and also legally protected Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present. Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

Glassworts (*Salicornia* spp.) and other annuals colonising mud and sand are found in the creeks of the saltmarshes and at the seaward edges of them. The habitat also occurs in small amounts on some stretches of the shore free of stones.

The estuary and the other E.U. Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*. An extensive area of honey-comb worm biogenic reef occurs adjacent to Duncannon, Co. Wexford on the eastern shore of the estuary. It is formed by the polychaete worm *Sabellaria alveolata*. This intertidal *Sabellaria alveolata* reef is formed as a sheet of interlocking tubes over a considerable area of exposed bedrock. This polychaete species constructs tubes, composed of aggregated sand grains, in tightly packed masses with a distinctive honeycomb-like appearance. These can be up to 25cm proud of the substrate and form hummocks, sheets or more massive formations. A range of species are reported from these reefs including: *Enteromorpha* sp.; *Ulva* sp.; *Fucus vesiculosus*; *Fucus serratus*; *Polysiphonia* sp.; *Chondrus crispus*; *Palmaria palmate*; *Coralinus officinalis*; *Nemertea* sp.; *Actinia equine*; *Patella vulgate*; *Littorina littorea*; *Littorina obtusata* and *Mytilus edulis*.

The western shore of the harbour is generally stony and backed by low cliffs of glacial drift. At Woodstown there is a sandy beach, now much influenced by recreation pressure and erosion. Behind it a lagoonal marsh has been impounded which runs westwards from Gaultiere Lodge along the course of a slow stream. An extensive reedbed occurs here. At the edges is a tall fen dominated by sedges (*Carex* spp.), Meadowsweet, willowherbs (*Epilobium* spp.) and rushes (*Juncus* spp.). Wet woodland also occurs.

The dunes which fringe the strand at Duncannon are dominated by Marram (*Ammophila arenaria*) towards the sea. Other species present include Wild Clary/Sage (*Salvia verbenaca*), a rare Red Data Book species. The rocks around Duncannon ford have a rich flora of seaweeds typical of a moderately exposed shore and the cliffs themselves support a number of coastal species on ledges, including Thrift, Rock Samphire (*Crithmum maritimum*) and Buck's-horn Plantain (*Plantago coronopus*).

Other habitats which occur throughout the site include wet grassland, marsh, reedswamp, improved grassland, arable land, quarries, coniferous plantations, deciduous woodland, scrub and ponds.

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge, Clustered Clover, Basil Thyme (*Acinos arvensis*), Red Hemp-nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh-grass, Meadow Barley, Opposite-leaved Pondweed (*Groenlandia densa*), Meadow Saffron/Autumn Crocus (*Colchicum autumnale*), Wild Clary/Sage, Nettle-leaved Bellflower, Saw-wort (*Serratula tinctoria*), Bird Cherry

(*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Ivy Broomrape (*Orobanche hederæ*) and Greater Broomrape. Of these, the first nine are protected under the Flora (Protection) Order, 2015. Divided Sedge was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge, Field Garlic (*Allium oleraceum*) and Summer Snowflake. Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including Freshwater Pearl Mussel (both *Margaritifera margaritifera* and *M. m. durrovensis*), White-clawed Crayfish, Salmon, Twaite Shad, three lamprey species – Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail *Vertigo moulinsiana* and Otter. This is the only site in the world for the hard water form of the Freshwater Pearl Mussel, *M. m. durrovensis*, and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.

The site supports many other important animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Badger, Irish Hare and Common Frog. The rare Red Data Book fish species Smelt (*Osmerus eperlanus*) occurs in estuarine stretches of the site. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater mussel species, *Anodonta anatina* and *A. cygnea*.

Three rare invertebrates have been recorded in alluvial woodland at Murphy's of the River. These are: *Neoascia obliqua* (Order Diptera: Syrphidae), *Tetanocera freyi* (Order Diptera: Sciomyzidae) and *Dictya umbrarum* (Order Diptera: Sciomyzidae). The rare invertebrate, *Mitostoma chrysomelas* (Order Arachnida), occurs in the old oak woodland at Abbeyleix and only two other sites in the country. Two flies (Order Diptera) *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur at this woodland.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species, including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois, and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country. The old oak woodland at Abbeyleix has a typical bird fauna including Jay, Long-eared Owl and Raven. The reedbed at Woodstown supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

Land use at the site consists mainly of agricultural activities – mostly intensive in nature and principally grazing and silage production. Slurry is spread over much of the area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath, are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel (*Prunus laurocerasus*) and Rhododendron (*Rhododendron ponticum*). The water quality of the site remains vulnerable. Good quality water is necessary to maintain the populations of the Annex II animal species listed above. Good quality is dependent on controlling fertilisation of the grasslands, particularly along the Nore. It also requires that sewage be properly treated before discharge. Drainage activities in the catchment can lead to flash floods which can damage the many Annex II species present. Capital and maintenance dredging within the lower reaches of the system pose a threat to migrating fish species such as lamprey and shad. Land reclamation also poses a threat to the salt meadows and the populations of legally protected species therein.

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows and the population of the hard water form of the Freshwater Pearl Mussel, which is limited to a 10 km stretch of the Nore, add further interest to this site.

National Parks and Wildlife Service

Conservation Objectives

River Barrow and River Nore SAC 002162



*An Roinn
Ealaíon, Oidhreachta agus Gaeltachta*
*Department of
Arts, Heritage and the Gaeltacht*

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

* indicates a priority habitat under the Habitats Directive

002162 River Barrow and River Nore SAC

QI	Description
1016	Desmoulin's whorl snail <i>Vertigo moulinsiana</i>
1029	Freshwater pearl mussel <i>Margaritifera margaritifera</i>
1092	White-clawed crayfish <i>Austropotamobius pallipes</i>
1095	Sea lamprey <i>Petromyzon marinus</i>
1096	Brook lamprey <i>Lampetra planeri</i>
1099	River lamprey <i>Lampetra fluviatilis</i>
1103	Twaite shad <i>Alosa fallax</i>
1106	Atlantic salmon (<i>Salmo salar</i>) (only in fresh water)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1310	<i>Salicornia</i> and other annuals colonizing mud and sand
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)
1355	Otter <i>Lutra lutra</i>
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
1421	Killarney fern <i>Trichomanes speciosum</i>
1990	Nore freshwater pearl mussel <i>Margaritifera durrovensis</i>
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation
4030	European dry heaths
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
7220	* Petrifying springs with tufa formation (<i>Cratoneurion</i>)
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
91E0	* Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title: Desmoulin's whorl snail (*Vertigo moulinsiana* - 1016) Conservation Status Assessment Report

Year: 2011

Author: Moorkens, E. ; Killeen, I.

Series: Unpublished Report to NPWS

Title: River Barrow and River Nore SAC (002162): Conservation objectives supporting document - woodland habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: River Barrow and River Nore SAC (002162): Conservation objectives supporting document - coastal habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: River Barrow and River Nore SAC (002162): Conservation objectives supporting document - marine habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: Second Draft Nore Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)

Year: 2010

Author: DEHLG

Series: Unpublished Report to NPWS

Title: Site investigations for *Sabellaria alveolata* (Honey-comb worm) biogenic reefs in Ireland

Year: 2010

Author: NPWS

Series: Unpublished Report to NPWS

Title: Irish Semi-natural Grasslands Survey. Annual report no. 3: Counties Donegal, Dublin, Kildare & Sligo

Year: 2010

Author: O'Neill, F.H.; Martin, J.R.; Devaney, F.M.; McNutt, K.E.; Perrin, P.M. ; Delaney, A.

Series: Unpublished Report to NPWS

Title: A provisional inventory of ancient and long-established woodland in Ireland

Year: 2010

Author: Perrin, P.M.; Daly, O.H.

Series: Irish Wildlife Manuals No. 46

Title: Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland [Version 1.0]

Year: 2010

Author: Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.

Series: Irish Wildlife Manuals No. 48

Title:	A technical manual for monitoring white-clawed crayfish <i>Austropotamobius pallipes</i> in Irish lakes
Year:	2010
Author:	Reynolds, J.D.; O'Connor, W.; O'Keeffe, C.; Lynn, D.
Series:	Irish Wildlife Manuals No. 45
Title:	Report of the standing scientific committee to the DCENR. The status of Irish salmon stocks in 2010 and precautionary catch advice for 2011
Year:	2010
Author:	SSC
Series:	Unpublished Report to DCENR
Title:	The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. [S.I. 296 of 2009]
Year:	2009
Author:	Government of Ireland
Series:	Irish Statute Book
Title:	The European Communities Environmental Objectives (Surface Water) Regulations 2009. [S.I. 272 of 2009]
Year:	2009
Author:	Government of Ireland
Series:	Irish Statute Book
Title:	Saltmarsh Monitoring Report 2007-2008
Year:	2009
Author:	McCorry, M.; Ryle, T.
Series:	Unpublished Report to NPWS
Title:	<i>Margaritifera durrovensis</i> Survey of Nore River. June – July 2009. NS 2 project
Year:	2009
Author:	Moorkens, E. A.
Series:	Unpublished Report to NPWS
Title:	Benthic Biotope classification of subtidal sedimentary habitats in the Lower River Suir candidate Special Area of Conservation and the River Nore and River Barrow candidate Special Area of Conservation
Year:	2008
Author:	ARMS
Series:	Unpublished Report to NPWS
Title:	A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of Waterford Estuary
Year:	2008
Author:	ASU
Series:	Unpublished Report to NPWS
Title:	Assessment of the Risk of Barriers to Fish Migration in the Nore Catchment, Southern Regional Fisheries Board
Year:	2008
Author:	CFB; Compass Informatics
Series:	Unpublished Report to CFB

Title: Poor water quality constrains the distribution and movements of Twaite shad *Alosa fallax fallax* (Lacepede, 1803) in the watershed of river Scheldt

Year: 2008

Author: Maas, J.; Stevens, M. ; Breine, J.

Series: Hydrobiologia 602, 129 - 143

Title: All Ireland Species Action Plan - Killarney fern

Year: 2008

Author: NPWS ; EHS-NI

Series: Unpublished Report to NPWS & EHS-NI

Title: National Survey of Native Woodlands 2003-2008

Year: 2008

Author: Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A.

Series: Unpublished Report to NPWS

Title: Saltmarsh Monitoring Report 2006

Year: 2007

Author: McCorry, M.

Series: Unpublished Report to NPWS

Title: Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents, Article 17 forms and supporting maps

Year: 2007

Author: NPWS

Series: Unpublished Report to NPWS

Title: A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments

Year: 2007

Author: O'Connor, W.

Series: Irish Wildlife Manuals No. 26

Title: Assessment of fish passage and the ecological impact of migration barriers on the River Nore catchment

Year: 2007

Author: Sullivan, A.

Series: Nore Suir Rivers Trust & OPW

Title: Otter Survey of Ireland 2004/2005

Year: 2006

Author: Bailey, M.; Rochford, J.

Series: Irish Wildlife Manuals No. 23

Title: The status of host fish populations and fish species richness in European freshwater pearl mussel (*Margaritifera margaritifera*) streams

Year: 2006

Author: Geist, J.; Porkka, M.; Kuehn, R.

Series: Aquatic Conservation: Marine and Freshwater Ecosystems 16, 251–266

Title: The distribution of Lamprey in the River Barrow SAC

Year: 2006

Author: King, J.J.

Series: Irish Wildlife Manuals No. 21

-
- Title:** Otters - ecology, behaviour and conservation
Year: 2006
Author: Kruuk, H.
Series: Oxford University Press
-
- Title:** The ecology and conservation of the gametophyte generation of the Killarney Fern (*Trichomanes speciosum* Willd.) in Ireland
Year: 2005
Author: Kingston, N. ; Hayes, C.
Series: Biology and Environment: Proceedings of the Royal Irish Academy 105B(2): 71-79
-
- Title:** Pilot Project for Monitoring Populations of the Freshwater Pearl Mussel. Baseline survey of the Nore River SAC, Counties Laois and Kilkenny
Year: 2004
Author: Moorkens, E. A.
Series: Unpublished Report to NPWS
-
- Title:** Monitoring the river, sea and brook lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*
Year: 2003
Author: Harvey, J.; Cowx, I.
Series: Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough
-
- Title:** Ecology of Watercourses Characterised by *Ranunculion fluitantis* and *Callitriche-Batrachion* Vegetation
Year: 2003
Author: Hatton-Ellis, T.W.; Grieve, N.
Series: Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough.
-
- Title:** Ecology of the Allis and Twaite shad
Year: 2003
Author: Maitland, P.S.; Hatton-Ellis, T.W.
Series: Conserving Natura 2000 Rivers Ecology Series No. 3. English Nature, Peterborough
-
- Title:** A survey of the white-clawed crayfish, *Austropotamobius pallipes* (Lereboullet) and of water quality in two catchments of Eastern Ireland
Year: 2002
Author: Demers, A.; Reynolds, J. D.
Series: Bulletin Français de la Pêche et de la Pisciculture, 367: 729-740
-
- Title:** Reversing the habitat fragmentation of British woodlands
Year: 2002
Author: Peterken, G.
Series: WWF-UK, London
-
- Title:** A survey of broadleaf woodlands in 3 SACs: Barrow-Nore, River Unshin & Lough Forbes
Year: 2000
Author: Browne, A.; Dunne, F.; Roche, N.
Series: Unpublished Report to NPWS
-
- Title:** Diet of Otters *Lutra lutra* on Inishmore, Aran Islands, west coast of Ireland
Year: 1999
Author: Kingston, S.; O'Connell, M.; Fairley, J.S.
Series: Biol & Environ Proc R Ir Acad B 99B:173-182

-
- Title:** Conservation Management of the White-clawed Crayfish, *Austropotamobius pallipes*
Year: 1998
Author: Reynolds, J.D.
Series: Irish Wildlife Manuals No. 1
-
- Title:** Studies on the biology and ecology of Margaritifera in Ireland
Year: 1996
Author: Moorkens, E.A.
Series: Unpublished PhD thesis, University of Dublin, Trinity College.
-
- Title:** Imminent extinction of the Nore freshwater pearl mussel *Margaritifera durrovensis* Phillips: a species unique to Ireland
Year: 1994
Author: Moorkens, E.A. ; Costello, M.J.
Series: Aquatic Conservation: Marine and Freshwater Ecosystems 4,363-365
-
- Title:** The spatial organization of otters (*Lutra lutra*) in Shetland
Year: 1991
Author: Kruuk, H.; Moorhouse, A.
Series: J. Zool, 224: 41-57
-
- Title:** The vegetation of Irish rivers
Year: 1987
Author: Heuff, H.
Series: Unpublished Report
-
- Title:** Otter survey of Ireland
Year: 1982
Author: Chapman, P.J.; Chapman, L.L.
Series: Unpublished Report to Vincent Wildlife Trust
-

Spatial data sources

Year:	2010
Title:	EPA transitional waterbody data
GIS operations:	Clipped to SAC boundary
Used for:	1130 (map 2)
Year:	Interpolated 2011
Title:	Intertidal and subtidal surveys 2008 & 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data
Used for:	Marine community types, 1140 (maps 3 & 4)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; Saltmarsh and Sand Dune datasets erased out if applicable
Used for:	Marine community types base data (map 4)
Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary; overlapping regions with Sand Dune data investigated and resolved with expert opinion used
Used for:	1310, 1330, 1410 (map 5)
Year:	Derived 2011
Title:	Internal NPWS files
GIS operations:	Dataset created from spatial reference contained in files
Used for:	7220 (map 6)
Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary
Used for:	91A0, 91E0 (map 6)
Year:	2011
Title:	NPWS rare and threatened species database
GIS operations:	Dataset created from spatial references in database records
Used for:	1016, 1092, 1421, 1990 (map 7)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the landward side of the river banks data; creation of a 20m buffer applied to river centerline and stream data; combination of 10m river banks and 20m river and stream centerline buffer datasets; combined river and stream buffer dataset clipped to HWM; combination of HWM buffer dataset with river and stream buffer dataset; overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary
Used for:	1355 (no map)

1016 Desmoulin's whorl snail *Vertigo moulinsiana*

To maintain the favourable conservation condition of Desmoulin's whorl snail in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: occupied sites	Number	No decline. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois. See map 7	Data from NPWS rare and threatened species database
Population size: adults	Number per positive sample	At least 5 adults snails in at least 50% of samples	Attribute and target from Moorkens and Killeen (2011)
Population density	Percentage positive samples	Adult snails present in at least 60% of samples per site	Attribute and target from Moorkens and Killeen (2011)
Area of occupancy	Hectares	Minimum of 1ha of suitable habitat per site	Attribute and target from Moorkens and Killeen (2011)
Habitat quality: vegetation	Percentage of samples with suitable vegetation	90% of samples in habitat classes I and II as defined in Moorkens & Killeen (2011)	Attribute and target from Moorkens and Killeen (2011)
Habitat quality: soil moisture levels	Percentage of samples with appropriate soil moisture levels	90% of samples in moisture class 3-4 as defined in Moorkens & Killeen (2011)	Attribute and target from Moorkens and Killeen (2011)

1029 Freshwater pearl mussel *Margaritifera margaritifera*

The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species. Please note that the Nore freshwater pearl mussel (*Margaritifera durrovensis*) remains a qualifying species for this SAC. This document contains a conservation objective for the latter species.

1092 White-clawed crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed crayfish in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	No reduction from baseline. See map 7	The crayfish is present almost throughout this SAC. The records extend as far downstream as Thomastown on the Nore and Graiguenamanagh on the Barrow
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples	See Reynolds et al. (2010) for further details
Negative indicator species	Occurrence	No alien crayfish species	Alien crayfish species are identified as major direct threat to this species and as disease vector. See Reynolds (1998) for further details
Disease	Occurrence	No instances of disease	Disease is identified as major threat and has occurred in Ireland even in the absence of alien vectors. See Reynolds (1998) for further details
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	Target taken from Demers and Reynolds (2002). Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Crayfish need high habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions must be available on the whole length of occupied habitat

1095 Sea lamprey *Petromyzon marinus*

To restore the favourable conservation condition of Sea lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information on artificial barriers
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Attribute and target based on data from Harvey and Cowx (2003) and O'Connor, (2007). King (2007) provides survey information for the Barrow
Juvenile density in fine sediment	Juveniles/m ²	Juvenile density at least 1/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003)
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels. Artificial barriers are currently preventing lamprey from accessing suitable spawning habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Artificial barriers are currently preventing juvenile lampreys from accessing the full extent of suitable habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information

1096 Brook lamprey *Lampetra planeri*

To restore the favourable conservation condition of Brook lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all watercourses down to first order streams	Artificial barriers can block lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information on artificial barriers
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Attribute and target based on data from Harvey and Cowx (2003). King (2007) provides survey information for the Barrow. It is impossible to distinguish between brook and river lamprey juveniles in the field, hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003) who state 10/m ² in optimal conditions and more than 2/m ² on a catchment basis
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels. Artificial barriers are currently preventing lamprey from accessing suitable spawning habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Artificial barriers are currently preventing juvenile lampreys from accessing the full extent of suitable habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information

1099 River lamprey *Lampetra fluviatilis*

To restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	Artificial barriers can block lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information on artificial barriers
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	Attribute and target based on data from Harvey and Cowx (2003). King (2007) provides survey information for the Barrow. It is impossible to distinguish between brook and river lamprey juveniles in the field, hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003) who state 10/m ² in optimal conditions and more than 2/m ² on a catchment basis
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels. Artificial barriers are currently preventing lamprey from accessing suitable spawning habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Artificial barriers are currently preventing juvenile lampreys from accessing the full extent of suitable habitat. See King (2006), Sullivan (2007) and CFB and Compass Informatics (2008) for further information

1103 Twaite shad *Alosa fallax*

To restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Population structure: age classes	Number of age classes	More than one age class present	Regular breeding has been confirmed in the River Barrow in recent years, but not in the Nore
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning habitats	
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l	Attribute and target based on Maas, Stevens and Briene (2008)
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	See Maitland and Hatton-Ellis (2003) for further information

Conservation objectives for: River Barrow and River Nore SAC [002162]

1106 Atlantic salmon (*Salmo salar*) (only in fresh water)

To restore the favourable conservation condition of Salmon in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See Sullivan (2007) and CFB and Compass Informatics (2008) for further information on artificial barriers
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	A conservation limit is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2010). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The Nore is currently exceeding its CL, while the Barrow is below its CL
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice (<i>Lepeophtheirus salmonis</i>)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels. Artificial barriers are currently preventing salmon from accessing suitable spawning habitat
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 2	Habitat area was estimated using OSI data and the defined Transitional Water Body area under the Water Framework Directive as 3856ha. See marine supporting document for further details
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with <i>Fabulina fabula</i> community. See map 4	The likely area of sediment communities was derived from a combination of intertidal and subtidal surveys undertaken in 2008 (ARMS, 2008; ASU, 2008). See marine supporting document for further details
Community extent	Hectares	Maintain the natural extent of the <i>Sabellaria alveolata</i> reef, subject to natural process. See map 4	The likely area of this community is derived from a survey undertaken in 2010 (NPWS, 2010). See marine supporting document for further details

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of the Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated using OSI data as 926ha. See marine supporting document for further details
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex. See map 4	The likely area of sediment communities was derived from a combination of intertidal and subtidal surveys undertaken in 2008 (ARMS, 2008; ASU, 2008). See marine supporting document for further details

1310 Salicornia and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For the one sub-site mapped: Ringville - 0.03ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). The Ringville sub-site was mapped and no additional areas of potential <i>Salicornia</i> mudflat were identified from an examination of aerial photographs, giving a total estimated area of 0.03ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009).	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species: <i>Spartina anglica</i>	Hectares	No significant expansion of <i>Spartina</i> . No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 1.25ha, Killowen - 2.59ha, Rochestown - 17.50ha, Ringville - 6.70ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). Four sub-sites were mapped and additional areas of potential saltmarsh were identified from an examination of aerial photographs, giving a total estimated area of Atlantic salt meadow of 35.07ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species: <i>Spartina anglica</i>	Hectares	No significant expansion of <i>Spartina</i> . No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in south-east estimated at 73% (Bailey and Rochford, 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 857.7ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 616.6km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 0.08ha, Rochestown - 0.04ha, Ringville - 6.70ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). Three sub-sites were mapped and no additional areas of potential saltmarsh were identified from an examination of aerial photographs, giving a total estimated area of Mediterranean salt meadow of 6.82ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species: <i>Spartina anglica</i>	Hectares	No significant expansion of <i>Spartina</i> . No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on McCorry and Ryle (2009). See coastal habitats supporting document for further details

1421 Killarney fern *Trichomanes speciosum*

To maintain the favourable conservation condition of Killarney Fern in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Location	No decline. Three locations known, with three colonies of gametophyte and one sporophyte colony. See map 7	Data from NPWS rare and threatened species database
Population size	Number	Maintain at least three colonies of gametophyte, and at least one sporophyte colony of over 35 fronds	Data from NPWS rare and threatened species database
Population structure: juvenile fronds	Occurrence	At least one of the locations to have a population structure comprising sporophyte, unfurling fronds, 'juvenile' sporophyte and gametophyte generations	'Juvenile' sporophytes, which appear as small entire fronds, are known from this site. However, it is unknown whether they are due to apogamous growth or sexual reproduction. Based on Kingston and Hayes (2005) and Ni Dhuill (pers. Comm.)
Habitat extent	m ²	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in or near to, known colonies. No loss of woodland canopy at or near to known locations	Based on Kingston and Hayes (2005) and Ni Dhuill (pers. Comm.)
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations	Based on Kingston and Hayes (2005) and Ni Dhuill (pers. Comm.)
Hydrological conditions: humidity	Number of dessicated fronds	No increase. Presence of dessicated sporophyte fronds or gametophyte mats indicates conditions are unsuitable	Based on Kingston and Hayes (2005) and Ni Dhuill (pers. Comm.)
Light levels: shading	Percentage	No changes due to anthropogenic impacts	Based on Kingston and Hayes (2005) and Ni Dhuill (pers. Comm.)
Invasive species	Occurrence	Absent or under control	NPWS and EHS-NI (2008) provides further details

1990 Nore freshwater pearl mussel *Margaritifera durrovensis*

To restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Kilometres	Maintain at 15.5km. See map 7	The population stretches from Poorman's Bridge (S407859) to Lismaine Bridge (S442660), with most of the population found between Poorman's Bridge and the Avonmore Creamery above Ballyragget (S 440 722) (Moorkens, 1996)
Population size: adult mussels	Number	Restore to 5,000 adult mussels	The extant wild population of Nore freshwater pearl mussel is estimated as 300 adult individuals (Moorkens, 2009)
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length	Mussels of no more than 65mm are considered 'young mussels' and may be found buried in the substratum and/or beneath adult mussels. Mussels of no more than 30mm are 'juvenile mussels' and are always buried in the substratum. This species is known not to have reproduced successfully in the River Nore since 1970 (Moorkens and Costello, 1994; Moorkens, 2004; Government of Ireland, 2009 [S.I. 272 of 2009])
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution	5% is considered the cut-off between the combined errors associated with natural fluctuations and sampling methods and evidence of true population decline. 1% of dead shells is considered to be indicative of natural losses
Habitat extent	Kilometres	Restore suitable habitat in length of river corresponding to distribution target (15.5km; see map 7) and any additional stretches necessary for salmonid spawning	The species habitat is a stretch of large lowland river and is a combination of 1) the area of habitat adult and juvenile mussels can occupy and 2) the area of spawning and nursery habitats the host fish can occupy. Fish nursery habitat typically overlaps with mussel habitat. Fish spawning habitat is generally adjacent mussel habitat, but may lie upstream of the generalised mussel distribution. Only those salmonid spawning areas that could regularly contribute juvenile fish to the areas occupied by adult mussels should be considered. The availability of mussel habitat and fish spawning and nursery habitats are determined by flow and substratum conditions. The habitat for the species is currently unsuitable for the survival of adult mussels or the recruitment of juveniles

Conservation objectives for: River Barrow and River Nore SAC [002162]

1990 Nore freshwater pearl mussel *Margaritifera durrovensis*

To restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Water quality: Macroinvertebrates and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality-macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93	These EQRs correspond to high ecological status for these two Water Framework Directive biological quality elements. They represent high water quality with very low nutrient concentrations (oligotrophic conditions). The habitat of the Nore pearl mussel failed both standards during 2009 sampling for the Sub-basin Management Plan (DEHLG, 2010). See also The European Communities Environmental Objectives (Surface Water Objectives) Regulations 2009
Substratum quality: Filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality-filamentous algae: absent or trace (<5%); macrophytes: absent or trace (<5%)	High abundance of macroalgae was recorded during 2009 sampling for the Sub-basin Management Plan (DEHLG, 2010). Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: sediment	Occurrence	Restore substratum quality-stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment	The habitat for the species is currently unsuitable for the survival of adult mussels or the recruitment of juveniles owing to sedimentation of the substratum. Significant sedimentation has been recorded during all recent mussel monitoring surveys. Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate	Differences in redox potential between the water column and the substrate correlate with differences in oxygen levels. Juvenile mussels require full oxygenation while buried in gravel. In suitable habitat, there should be very little loss of redox potential between the water column and underlying gravels. The redox potential loss in 2009 was 58-64% at 5cm depth (DEHLG, 2010)
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes	The availability of suitable Nore freshwater pearl mussel habitat is largely determined by flow (catchment geology being the other important factor). In order to restore the habitat for the species, flow variability over the annual cycle must be such that: 1) high flows can wash fine sediments from the substratum, 2) low flows do not exacerbate the deposition of fines and 3) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle

1990 Nore freshwater pearl mussel *Margaritifera durrovensis*

To restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae	Salmonid fish are host to the larval form of freshwater pearl mussels and thus, they are essential to the completion of the life cycle. 0+ and 1+ fish are typically used, both because of the habitat overlaps and the development of immunity with age in the fish. Fish presence is considered sufficient, as higher densities and biomass of fish is indicative of enriched conditions in mussel rivers. Geist et al. (2006) found that higher densities of host fish coincided with eutrophication, poor substrate quality for pearl mussels and a lack of pearl mussel recruitment, while significantly lower densities and biomass of host fish were associated with high numbers of juvenile mussels. Fish movement patterns must be such that 0+ fish in the vicinity of the mussel habitat remain in the mussel habitat until their 1+ summer. As native brown trout appear to be favoured by the Nore freshwater pearl mussel, it is particularly important that these are not out-competed by stocked fish

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline, subject to natural processes	The full distribution of this habitat and its sub-types in this site is currently unknown. The basis of the selection of the SAC for the habitat is the presence of an excellent example of the vegetation community (nutrient-rich type) associated with extensive tufa deposits on the river bed in the Kings tributary of the Nore (Heuff, 1987). Other examples of this or other sub-types may be present within the SAC
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	The full extent of this habitat in this site is currently unknown. See above
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	Due to regular disturbance (through variations in flow), river macrophytes rarely reach a climax condition but frequently occur as transient communities. A natural (relatively unmodified) flow regime is required for both plant communities and channel geomorphology to be in favourable condition, exhibiting typical dynamics for the river type (Hatton-Ellis and Grieve, 2003). For most of the sub-types of this habitat, high flows are required to maintain the substratum (see below) necessary for the characteristic species. Flow variation is particularly important, with high and flood flows being critical to the hydromorphology
Hydrological regime: groundwater discharge	Metres per second	The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation	This attribute refers to sub-types with tufa formations. Groundwater discharges to this habitat throughout the year
Substratum composition: particle size range	Millimetres	The substratum should be dominated by large particles and free from fine sediments	The tufaceous sub-types develop on relatively stable substrata such as bedrock, boulders and cobbles, where tufa can deposit and accumulate. Tufa deposition is believed to be biologically mediated, by algae and bryophytes. The substratum must remain free of fine sediments such as clay, silt and fine sand, which would adversely affect the growth of algae and mosses

3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Water chemistry: minerals	Milligrammes per litre	The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits	The tufaceous sub-types require mineral- (typically calcium-) rich groundwaters to allow deposition of tufa. Surface water must also be sufficiently base-rich to prevent chemical erosion. Alkalinity and/or total hardness data may also be relevant
Water quality: suspended sediment	Milligrammes per litre	The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments	See substratum composition above. Turbidity data may also be relevant
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	Phosphorus (MRP) is typically the limiting nutrient, however increased nitrogen (NO ₃ ⁻) negatively impacts upon the N-fixing blue-green algal communities that frequently contribute to tufa deposition. Nutrient enrichment of the habitat typically leads to increased filamentous-green-algal biomass, and consequent changes in other algae, bryophyte and macrophyte species composition and abundance. Water quality should reach a minimum of Water Framework Directive good status, in terms of nutrient standards, and macroinvertebrate and phytobenthos quality elements
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	The sub-types of this habitat are poorly understood and their typical species have not yet been defined. Typical species and appropriate targets may emerge to be site-specific. The typical species of the tufaceous sub-type in the Kings tributary of the Nore are identified in Heuff (1987). The typical species may include higher plants, bryophytes, macroalgae and microalgae
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained	River connectivity with the floodplain is essential for the functioning of this habitat. The site of the tufaceous sub-type in the King's River is within an area of floodplain, with further large floodplains upstream. Floodplains regulate fine sediment deposition within the channel. See substratum composition above

4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline from current habitat distribution, subject to natural processes	Spatial extent currently unmapped but indicated as occurring on the steep, free-draining, river valley sides especially the Barrow and tributaries in the foothills of the Blackstairs Mountains (based on NPWS NHA Survey - 1997/98 Site Notes; Natura 2000 Form Explanatory Notes - May 2006; The above NHA survey was prior to the extensions to the SAC that included river habitat and estuary at Ballyhack which may have incorporated additional dry heath habitat)
Habitat area	Hectares	Area stable or increasing, subject to natural processes. Habitat area is not known but estimated as less than 400ha of the area of the SAC, occurring in dispersed locations	Based on NPWS NHA Survey Site Notes (1997/98); Natura 2000 Form Explanatory Notes - May 2006
Physical structure: free-draining, acid, low nutrient soil; rock outcrops	Occurrence	No significant change in soil nutrient status, subject to natural processes. No increase or decrease in area of natural rock outcrop	Based on NPWS NHA Survey Site Notes - 1997/98; Natura 2000 Form Explanatory Notes - May 2006
Vegetation structure: sub-shrub indicator species	Percentage cover	Cover of characteristic sub-shrub indicator species at least 25%: gorse (<i>Ulex europaeus</i>) and where rocky outcrops occur bilberry (<i>Vaccinium myrtillus</i>) and woodrush (<i>Luzula sylvatica</i>). Some rock outcrops support English stonecrop (<i>Sedum anglicum</i>), sheep's bit (<i>Jasione montana</i>) and wild madder (<i>Rubia peregrina</i>) as well as important moss and lichen assemblages	Dry heath in this SAC occurs on free-draining nutrient poor soils and is often characterised by gorse and open acid grassland areas. A characteristic coastal dry heath of the southeast also occurs. Several rare plants occur including two species listed in the Red Data Book (Curtis and McGough, 1988). The species occurring on the site are listed in NPWS NHA Survey Site Notes - 1997/98. A brief overview of the principal characteristics of the dry heath habitat of this SAC is given in the Natura 2000 Explanatory Notes - May 2006
Vegetation structure: senescent gorse	Percentage cover	Cover of senescent gorse less than 50%	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath condition assessment methodology of Perrin et al. (2010)
Vegetation structure: browsing	Percentage cover	Long shoots of bilberry with signs of browsing collectively less than 33%	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath condition assessment methodology of Perrin et al. (2010)

4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation structure: native trees and shrubs	Percentage cover	Cover of scattered native trees and shrub less than 20%	Based on NPWS NHA Survey Site Notes - 1997/98; Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010). From the NHA survey notes the main threats appear to be reclamation or invasion by scrub woodland
Vegetation composition: positive indicator species	Number	Number of positive indicator species at least 2 e.g. gorse and associated dry heath/ acid grassland flora	Dry heath in this SAC occurs on free-draining nutrient poor soils and is characterised by gorse and acid grassland areas. It corresponds to Annex I sub-type "heaths rich in gorse (<i>Ulex</i>) of the Atlantic margins" (European Commission, 2007). Based on NPWS NHA Survey Site Notes -1997/98; Natura 2000 Form Explanatory Notes - May 2006 and a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010)
Vegetation structure: positive indicator species	Percentage cover	Cover of positive indicator species at least 60%. This should include plant species characteristic of dry heath in this SAC including gorse, bilberry and associated acid grassland flora	Dry heath in this SAC is characterised by gorse and acid grassland areas and locally bilberry and woodrush. Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010)
Vegetation composition: bryophyte and non-crustose lichen species	Number	Number of bryophyte or non-crustose lichen species present at least 2	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. 2010
Vegetation composition: bracken (<i>Pteridium aquilinum</i>)	Percentage cover	Cover of bracken less than 10% - however see 'Notes'	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010). Bracken appears to be quite dense in places and before any management action is considered its rate of spread needs to be established as well as its threat, if any, to other dry heath species and its potential value to important fauna (e.g. Twite)

4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation structure: weedy negative indicator species	Percentage cover	Cover of agricultural weed species (negative indicator species) less than 1%	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010)
Vegetation composition: non-native species	Percentage cover	Cover of non-native species less than 1%.	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010)
Vegetation composition: rare/scarce heath species	Location, area and number	No decline in distribution or population sizes of rare, threatened or scarce species, including Greater Broomrape (<i>Orobanche rapum-genistae</i>) and the legally protected clustered clover (<i>Trifolium glomeratum</i>)	Broomrape is dependent on gorse at this site as it is parasitic on gorse roots. It is recorded as occurring on steep slopes above New Ross. A small area of excellent dry coastal heath at Ballyhack is interspersed with patches rock and of dry lowland grassland and has a high species diversity. Notably there is an excellent range of Clover (<i>Trifolium</i>) species including the legally protected clustered clover, a species known only from one other site in Ireland. Also <i>T. ornithopodioides</i> , <i>T. striatum</i> and <i>Torilus nodosa</i> . Based on Natura 2000 Form Explanatory Notes May 2006, Irish Red Data Book (Curtis and Mc Gough, 1988) and on the NPWS database of rare and threatened vascular plants. Other areas of coastal heath may also occur
Vegetation structure: disturbed bare ground	Percentage cover	Cover of disturbed bare ground less than 10% (but if peat soil less than 5%)	Based on NPWS NHA Survey Site Notes and Natura 2000 Form Explanatory Notes - May 2006 and on a modified version of the dry heath habitat condition assessment methodology of Perrin et al. (2010)
Vegetation structure: burning	Occurrence	No signs of burning within sensitive areas	Perrin et al. (2010) defines sensitive areas

6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline, subject to natural processes	Distribution of this habitat in this site is currently unknown. Considered to occur in association with some riverside woodlands, unmanaged river islands and in narrow bands along the floodplain of slow-flowing stretches of river (Natura 2000 Form Explanatory Notes)
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Extent of this habitat in this site is currently unknown. See above
Hydrological regime: Flooding depth/height of water table	Metres	Maintain appropriate hydrological regimes	This habitat requires winter inundation, which results in deposition of naturally nutrient-rich sediment
Vegetation structure:sward height	Centimetres	30-70% of sward is between 40 and 150cm in height	Bare ground, due to natural inundation processes, may often be present. Attribute and target based on the Irish Semi-natural Grassland Survey (O'Neill et al., 2010)
Vegetation composition: broadleaf herb: grass ratio	Percentage	Broadleaf herb component of vegetation between 40 and 90%	Attribute and target based on O'Neill et al. (2010)
Vegetation composition: typical species	Number	At least 5 positive indicator species present	List of positive indicator species identified by O'Neill et al. (2010)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (<i>Impatiens glandulifera</i>), monkeyflower (<i>Mimulus guttatus</i>), Japanese knotweed (<i>Fallopia japonica</i>) and giant hogweed (<i>Heracleum mantegazzianum</i>)	Species listed as being present in the site (Natura 2000 Form Explanatory Notes)

7220 * Petrifying springs with tufa formation (*Cratoneurion*)

To maintain the favourable conservation condition of Petrifying springs with tufa formation (*Cratoneurion*) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Square metres	Area stable or increasing, subject to natural processes	Extent of this habitat in this site is currently unknown. An area ("Tens of square metres") has been described at one location (Natura 2000 Form Explanatory Notes; internal NPWS files), see below
Habitat distribution	Occurrence	No decline. See map 6 for recorded location	Full distribution of this habitat in this site is currently unknown. It has been described in woodlands at Dysart, between Thomastown and Inistioge (Natura 2000 Form Explanatory Notes; internal NPWS files). NB further areas are likely to occur within the site
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes	Current hydrological regimes are unknown. Petrifying springs rely on permanent irrigation, usually from upwelling groundwater sources or seepage sources
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions	Water chemistry is currently unknown. Water supply to petrifying springs is characteristically oligotrophic and calcareous
Vegetation composition: typical species	Occurrence	Maintain typical species	The bryophytes <i>Cratoneurion commutatum</i> and <i>Eucladium verticillatum</i> are diagnostic of this habitat. Both are found at the location described above. Natura 2000 Form Explanatory Notes and internal NPWS files also list other typical species

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old oak woodland with *Ilex* and *Blechnum* in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 85.08ha for sub-sites surveyed: see map 6	Minimum area, based on 13 sites surveyed by Perrin et al. (2008) - site codes 14, 20, 49, 73, 125, 508, 509, 510, 514, 515, 518, 519, 521, and other sources. NB further unsurveyed areas maybe present within the site
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the site
Woodland size	Hectares	Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical and land ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008); Browne et al. (2000). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008); Browne et al. (2000). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak regenerates poorly. In suitable sites ash can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m ³ per hectare; number per hectare	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem.
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old oak woodland with *Ilex* and *Blechnum* in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: indicators of local distinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-listed and other rare or localised species. Perrin and Daly (2010) list sites 14, 20, 73, 125, 508, 509, 510, 514, 515, 518, 521 as potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008); Browne et al. (2000)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (<i>Quercus petraea</i>) and birch (<i>Betula pubescens</i>)	Species reported in Perrin et al. (2008); Browne et al. (2000)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (<i>Fagus sylvatica</i>), rhododendron (<i>Rhododendron ponticum</i>), cherry laurel (<i>Prunus laurocerasus</i>)

Conservation objectives for: River Barrow and River Nore SAC [002162]

91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

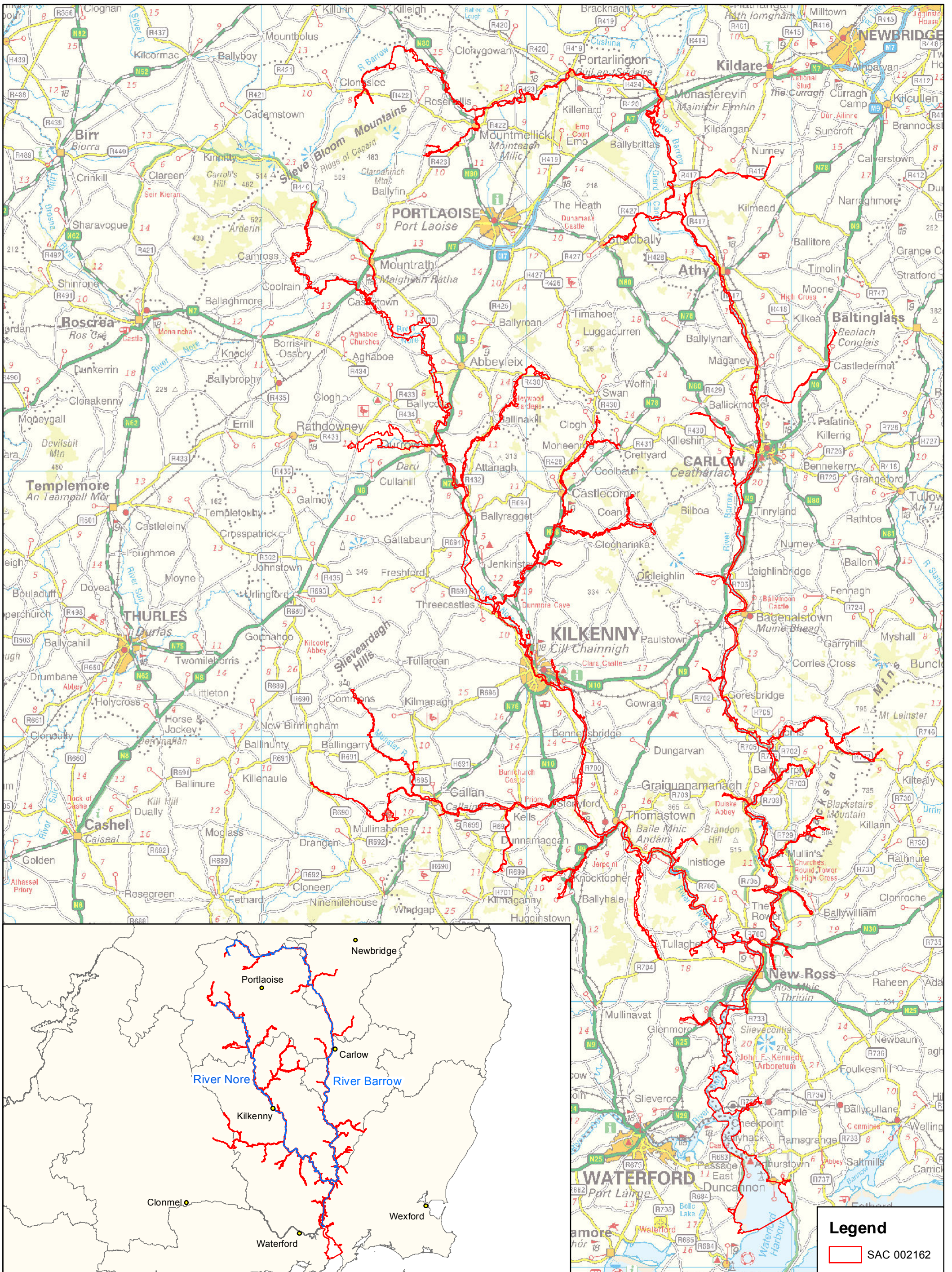
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 181.54ha for sites surveyed: see map 6	Minimum area, based on 16 sites surveyed by Perrin et al. (2008) - site codes 10, 15, 17, 126, 127, 262, 282, 287, 511, 516, 517, 518, 520, 608, 1021; Coillte LIFE project and other sources. NB further unsurveyed areas maybe present within the SAC
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the site
Woodland size	Hectares	Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical and land ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008); Browne et al. (2000). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008); Browne et al. (2000). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Alder and oak regenerate poorly. Ash often regenerates in large numbers although few seedlings reach pole size
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river flood plains but not for woodland around springs/seepage areas
Woodland structure: dead wood	m ³ per hectare; number per hectare	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

Conservation objectives for: River Barrow and River Nore SAC [002162]

91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

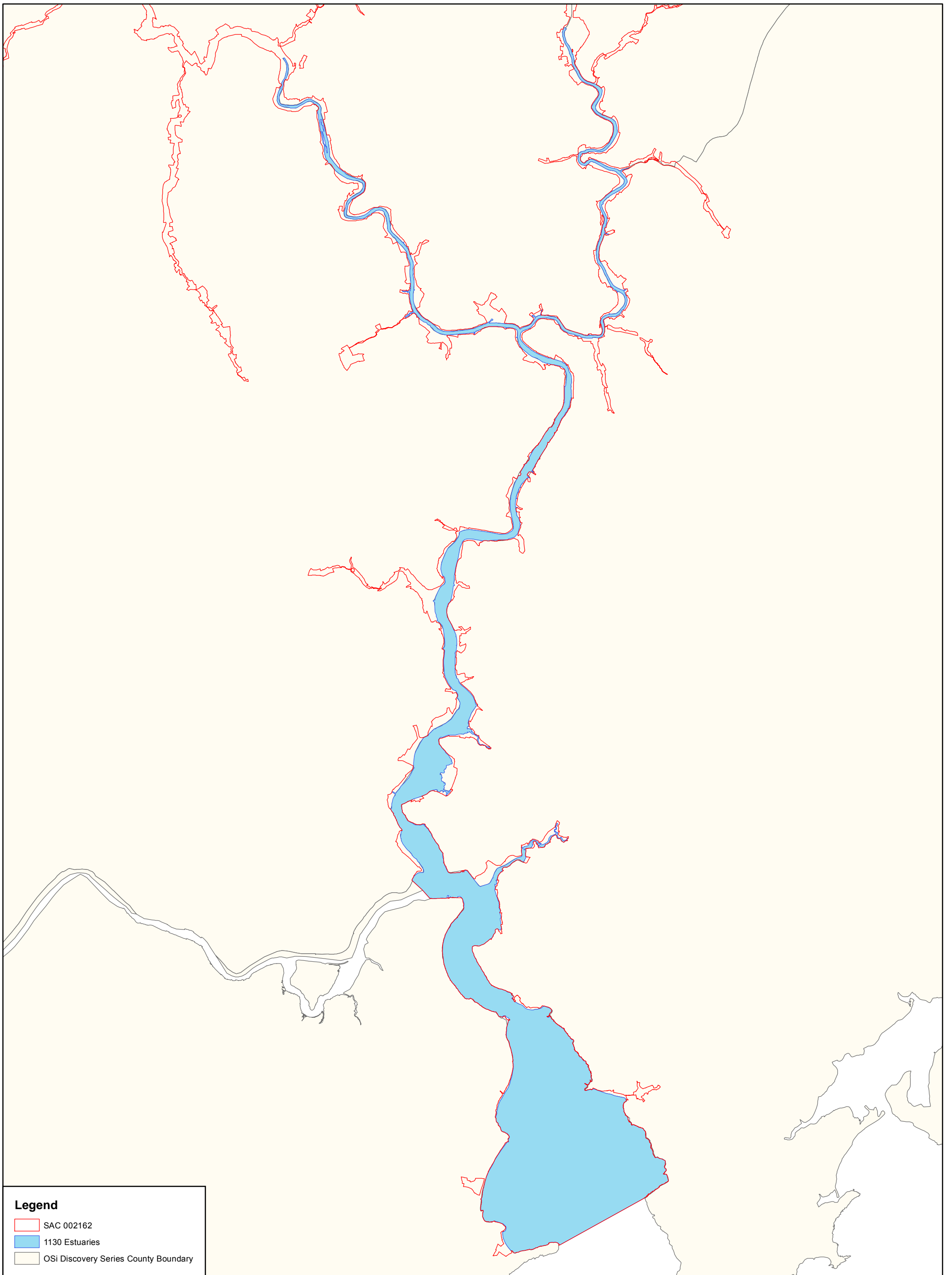
To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local distinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-listed and other rare or localised species. Perrin and Daly (2010) list sites 10, 15, 17, 127, 282, 516, 517, 518, 608 as potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008); Browne et al. (2000)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including ash (<i>Fraxinus excelsior</i>) alder (<i>Alnus glutinosa</i>), willows (<i>Salix</i> spp) and locally, oak (<i>Quercus robur</i>)	Species reported in Perrin et al. (2008); Browne et al. (2000)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: sycamore (<i>Acer pseudoplatanus</i>), beech (<i>Fagus sylvatica</i>), rhododendron (<i>Rhododendron ponticum</i>), cherry laurel (<i>Prunus laurocerasus</i>), dogwood (<i>Cornus sericea</i>), Himalayan honeysuckle (<i>Leycesteria formosa</i>) and Himalayan balsam (<i>Impatiens grandiflora</i>)



Legend

SAC 002162



Legend

- SAC 002162
- 1130 Estuaries
- OSi Discovery Series County Boundary

*An Roinn
Ealaíon, Oidhreacht agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht*

**MAP 2:
RIVER BARROW AND RIVER NORE
CONSERVATION OBJECTIVES
ESTUARIES**

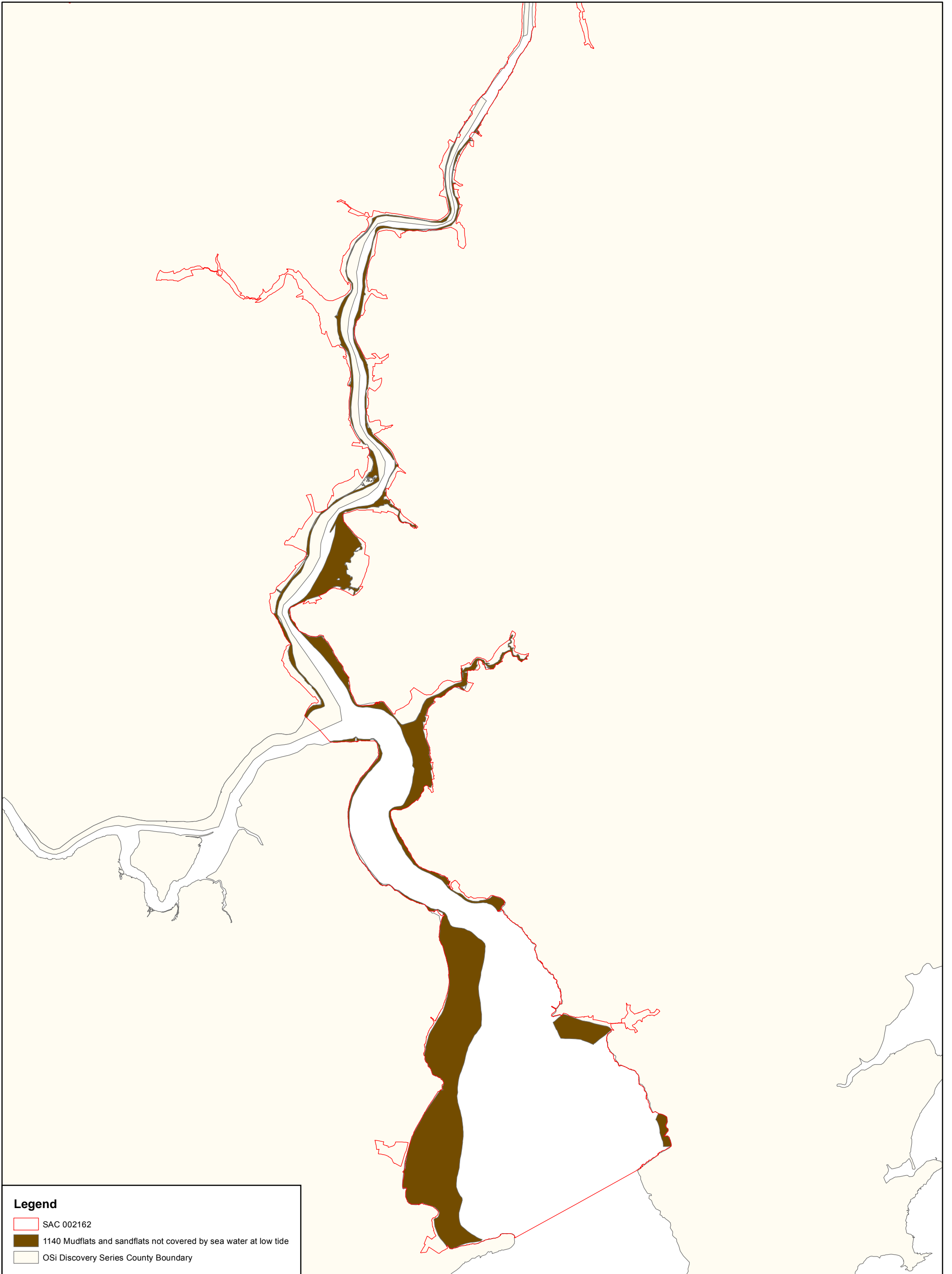
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002162
CO. CARLOW; version 1.03, CO. KILDARE; version 1.04,
CO. KILKENNY; version 1.1, CO. LAOIS; version 1.07,
CO. OFFALY; version 1.01, CO. TIPPERARY; version 1.01,
CO. WATERFORD; version 1.01, CO. WEXFORD; version 1.01

0 1 2 3 4 5 km

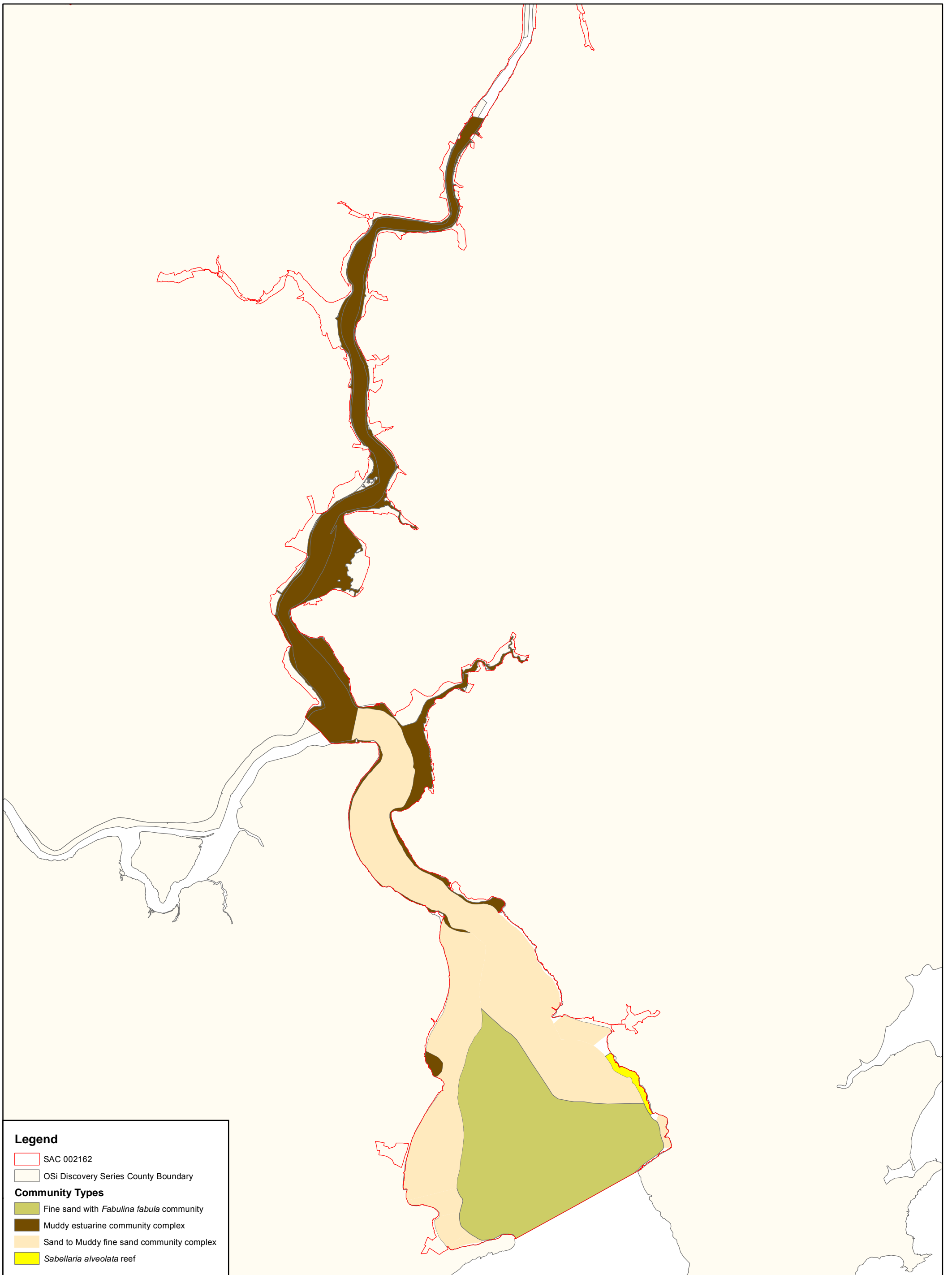
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059208).
Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar conharthaithe. Macsamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadúnas Uimh. EN 0059208)

**Map Version 1
Date: April 2011**



Legend

- SAC 002162
- 1140 Mudflats and sandflats not covered by sea water at low tide
- OSI Discovery Series County Boundary

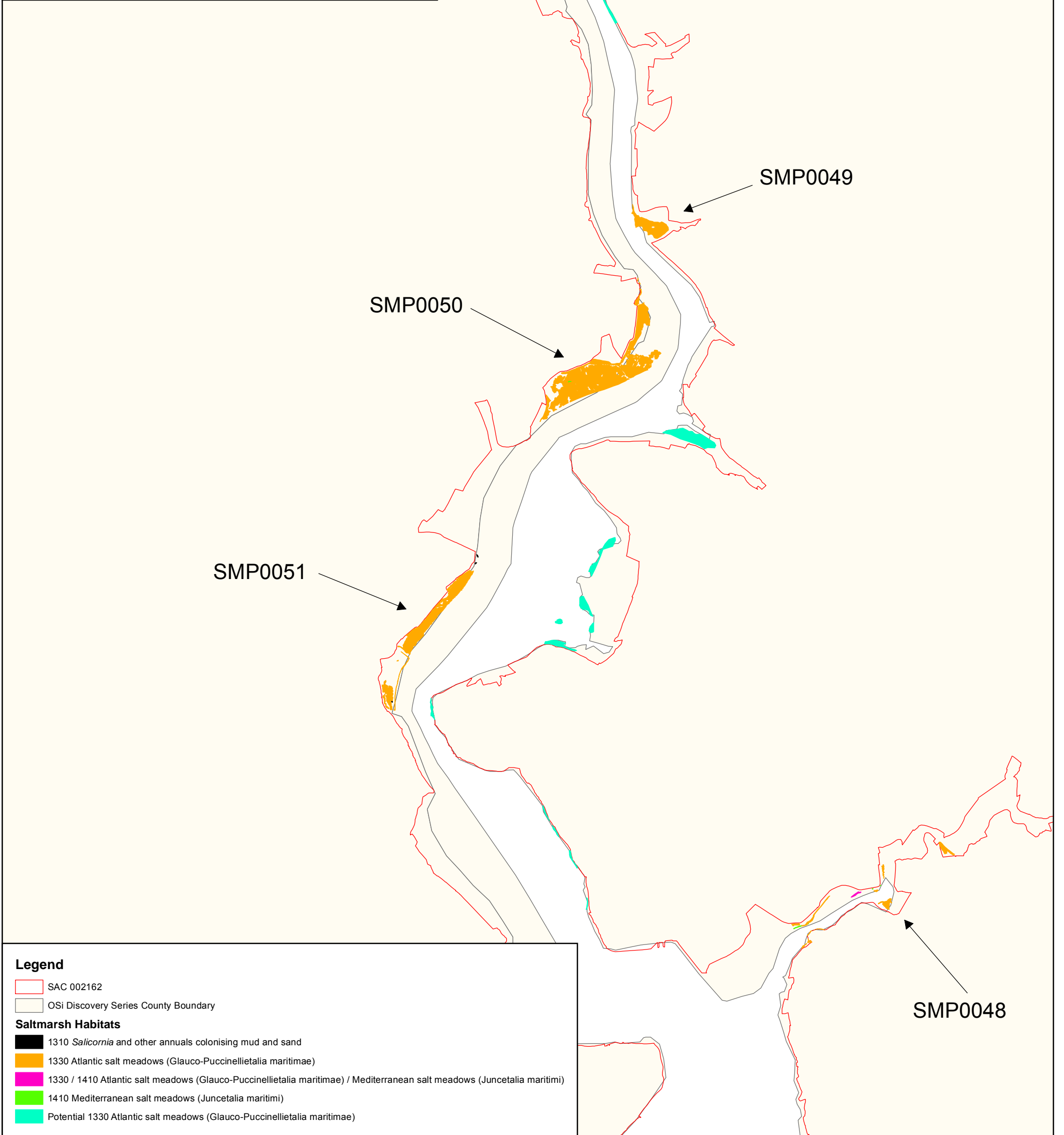
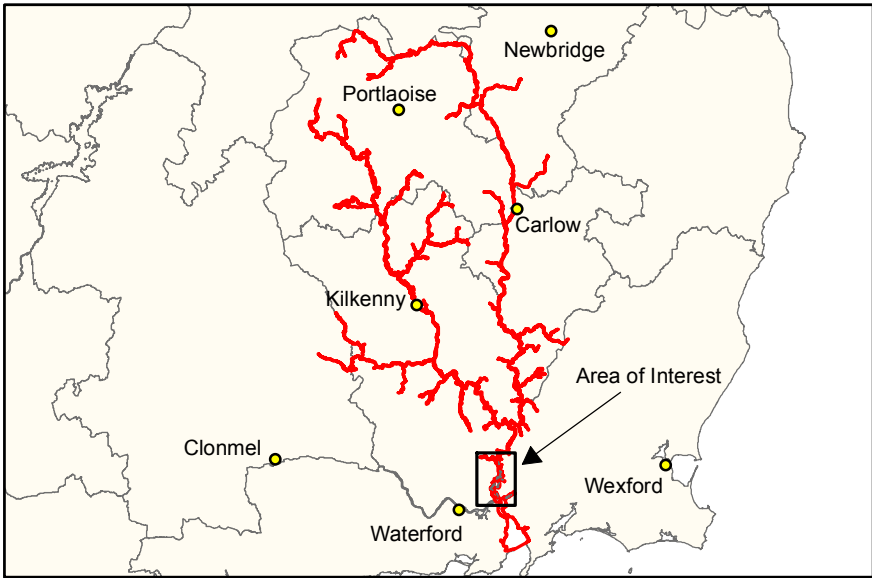


Legend

- SAC 002162
- OSi Discovery Series County Boundary

Community Types

- Fine sand with *Fabulina fabula* community
- Muddy estuarine community complex
- Sand to Muddy fine sand community complex
- Sabellaria alveolata* reef

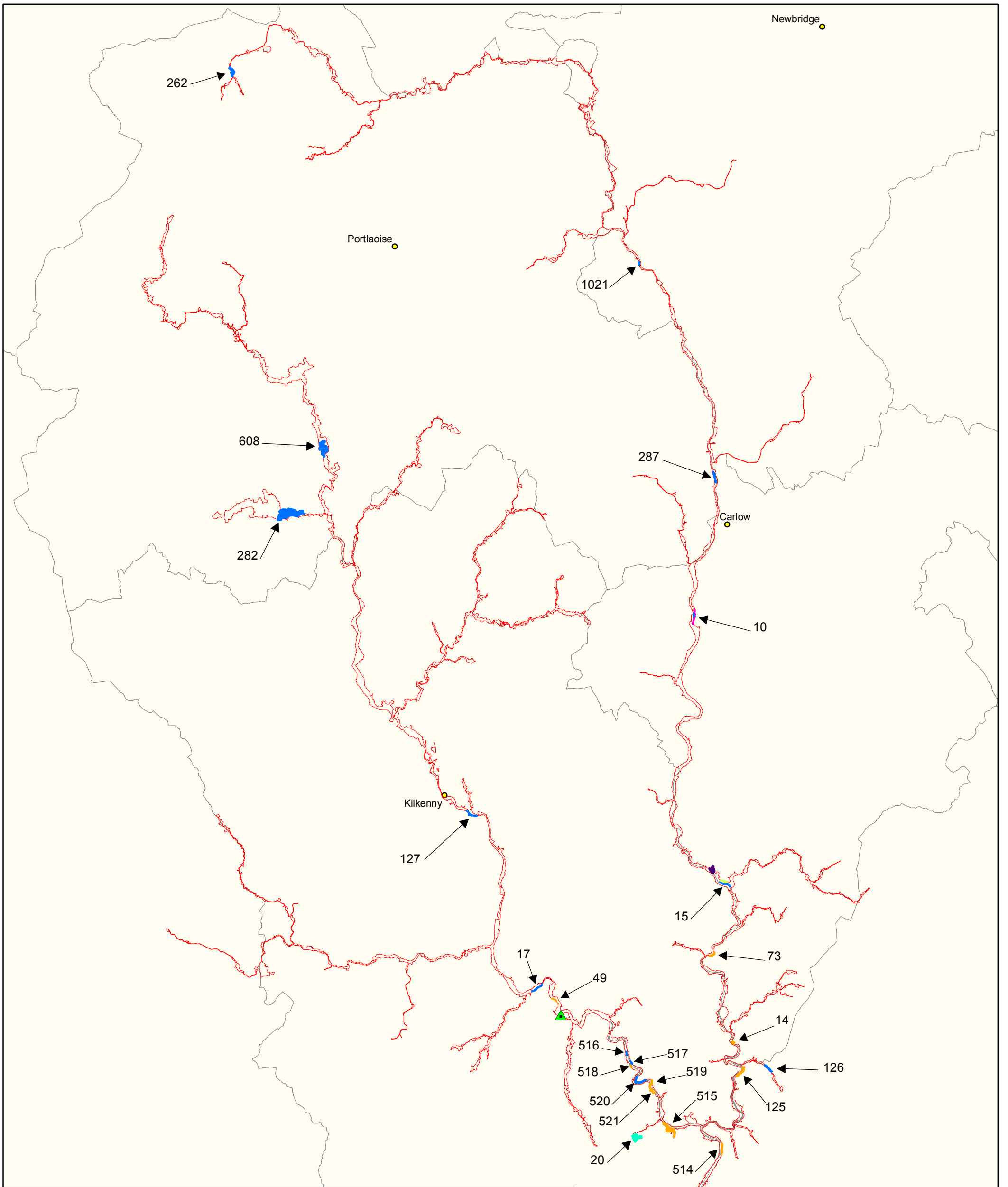


Legend

- SAC 002162
- OSi Discovery Series County Boundary

Saltmarsh Habitats

- 1310 *Salicornia* and other annuals colonising mud and sand
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- 1330 / 1410 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) / Mediterranean salt meadows (*Juncetalia maritimi*)
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)
- Potential 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

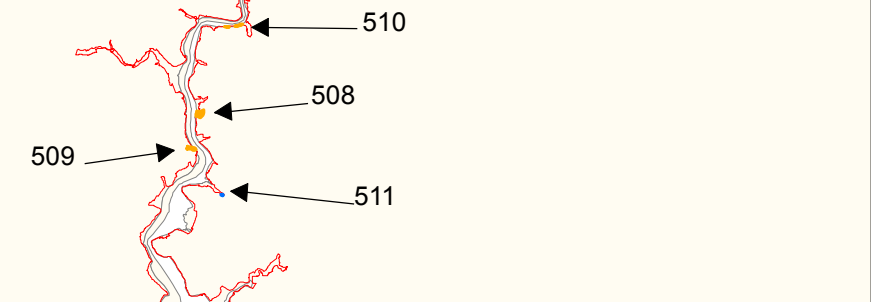


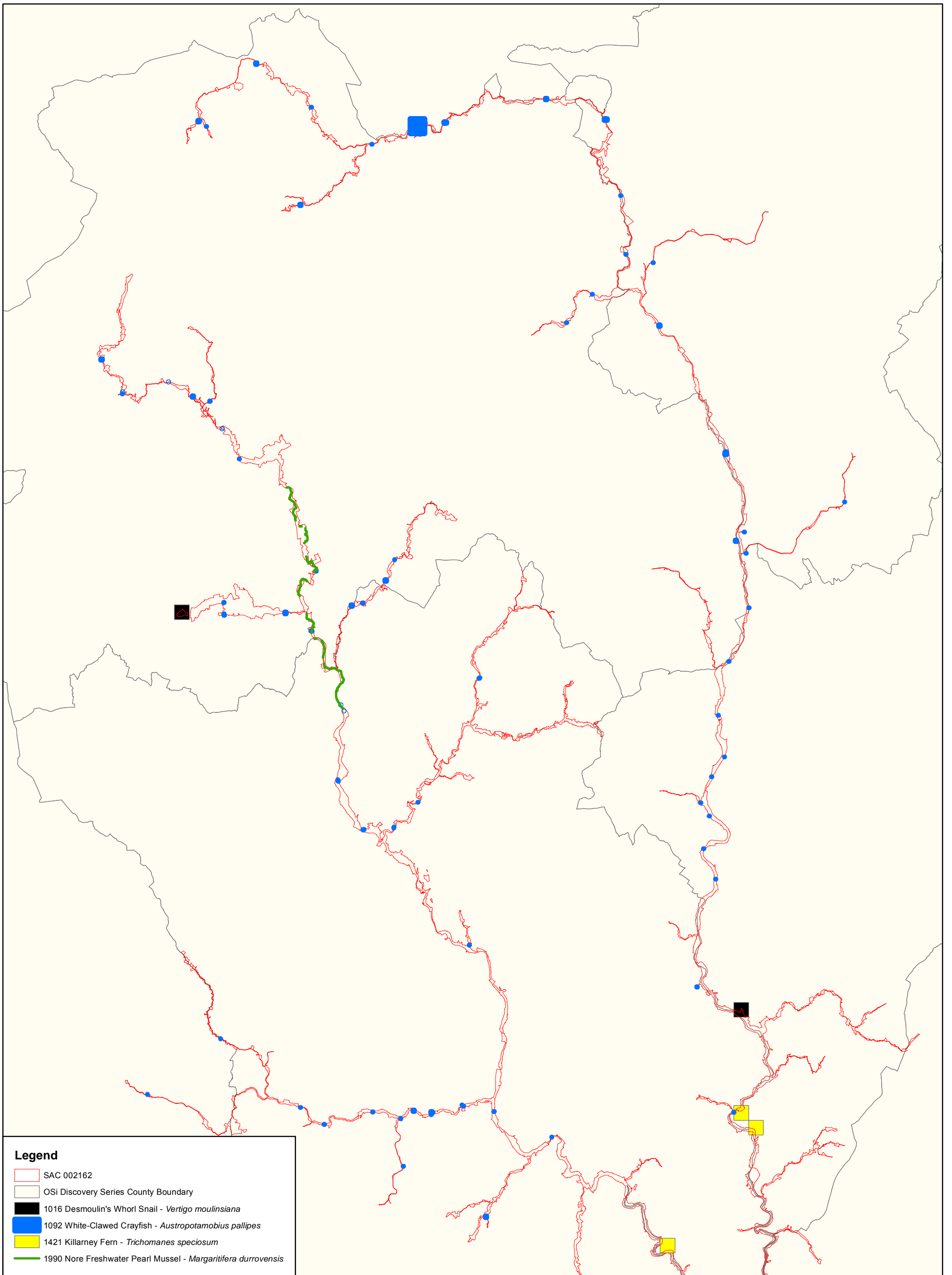
Legend

- SAC 002162
- OSI Discovery Series County Boundary
- ▲ 7220 *Petrifying springs with tufa formation (Cratoneurion)

Woodland Habitats

- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae)
- 91A0 / 91E0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles / *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae)
- WD1 (Mixed) broadleaved woodland
- WN2 / WD1 Oak-ash-hazel woodland / (Mixed) broadleaved woodland
- WN2 / WN6 Oak-ash-hazel woodland / Wet willow-alder-ash woodland





Legend

- SAC 002162
- OSI Discovery Series County Boundary
- 1016 Desmoulin's Whorl Snail - *Vertigo moulinsiana*
- 1092 White-Clawed Crayfish - *Austropotamobius pallipes*
- 1421 Killarney Fern - *Trichomanes speciosum*
- 1990 Nore Freshwater Pearl Mussel - *Margaritifera durrovensis*



**MAP 7:
RIVER BARROW AND RIVER NORE
CONSERVATION OBJECTIVES
DESMOULIN'S WHORL SNAIL, WHITE-
CLAWED CRAYFISH, NORE FRESHWATER
PEARL MUSSEL & KILLARNEY FERN**

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002162
CO. CARLOW; version 1.03, CO. KILDARE; version 1.04,
CO. KILKENNY; version 1.1, CO. LAOIS; version 1.07,
CO. OFFALY; version 1.01, CO. TIPPERARY; version 1.01,
CO. WATERFORD; version 1.01, CO. WEXFORD; version 1.01

0 2 4 6 8 10 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059208).
Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbhreithniú a déanamh ar theorainneacha na gceantar conharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadúnas Uimh. EN 0059208)

N

**Map Version 1
Date: April 2011**



An Roinn
Ealaíon, Oidhreacht agus Gaeltachta

Department of
Arts, Heritage and the Gaeltacht

**Produced by: National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,
7 Ely Place, Dublin 2, Ireland.
Web: www.npws.ie
E-mail: natureconservation@environ.ie**

Citation:

NPWS (2011) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editors: Rebecca Jeffrey & Naomi Kingston

ISSN 2009-4086

APPENDIX B

Response from IFI

From: Alan Cullagh [mailto:Alan.Cullagh@fisheriesireland.ie]
Sent: 20th January 2014
To: Máire Daly
Subject: RE: Query regarding Glenmore River and River Barrow & River Nore cSAC

Further to our telephone conversation, Inland Fisheries Ireland have no objection in principal to this development and believe it to be worthwhile and a positive development to the amenities in the area.

While we understand that no in stream works will be required and that only minor works will take place on the surface of the existing bridge it is important that IFI have a copy of the method statement of any works to be conducted at or near the water course to ensure all mitigating measures can be put in place to protect this valuable fishery resource.

Regards,

Alan Cullagh
Inland Fisheries Ireland

APPENDIX C

Response from DAHG



An Roinn
Ealaíon, Oidhreachta agus Gaeltachta

Department of
Arts, Heritage and the Gaeltacht

Our Ref: **G Pre00402/2013**

02 January 2014

Máire Daly
Roughan & O'Donovan
Consulting Engineers
Arena House
Arena Road
Sandyford
Dublin 18
Maire.Daly@rod.ie

Re: Cycleway/walkway Pre-Part 8 by Kilkenny Co Co - route via Waterford-Wexford

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to the above-proposed development. Outlined below are the observations and recommendations of the Department in relation to nature conservation.

As per the email correspondence dated 3 December 2013 to this Department, the proposed cycleway is part of a larger route between Wexford and Tralee which was identified in the National Cycle Network Scoping Study 2010. It is not clear why this project is being split and being treated as a Part 8. It is also not clear that the National Cycle Network Scoping Study 2010 study was referred to this Department and whether it was subjected to an appropriate assessment screening.

It is the view of this Department that if this is part of a large project then the project as whole should be assessed in order to ensure there can be no suggestion of project splitting and to ensure an adequate cumulative assessment of impacts is made. In addition it is not clear whether there will be an EIS or not. The Department would expect at least an ecological impact statement (EclS) to accompany the Part 8. The Department also notes that an AA screening will be carried out and that the proposed route will pass through River Barrow and River Nore cSAC. It seems likely therefore that an NIS may need to be prepared, particularly since it is proposed to surface the cycleway which may result in loss of habitat.

It is important to note that ecological corridors are covered under article 10 of the Habitats Directive and they include railway tracks and rivers. Any impact assessment should therefore look at the impact on such corridors.

Please find below some scoping for an EclS and AA screening/NIS.

EclS

With regard to scoping for an EclS for this proposed development an ecological survey should be carried out of the route of the proposed cycle track to survey the habitats and species present. Where ex-situ impacts are possible survey work may be required outside of the development site. Such surveys should be carried out by suitably qualified persons at an appropriate time of the year

depending on the species being surveyed for. The EclS should include the results of the surveys. Inland Fisheries Ireland should be consulted with regard to fish species if applicable.

With regard to any existing records the data of the National Parks and Wildlife Service (NPWS) should be consulted at www.npws.ie and the data of the National Biodiversity Data Centre at <http://www.biodiversityireland.ie/> . Reference should be made to the National Biodiversity Plan and any relevant County Biodiversity Plan. The EclS should also address the issue of invasive alien plant and animal species, such as Japanese Knotweed, and detail the methods required to ensure they are not accidentally introduced or spread during construction. Information on alien invasive species in Ireland can be found at <http://invasives.biodiversityireland.ie/> and at <http://invasivespeciesireland.com/> .

The impact of the development on the flora, fauna and habitats present should be assessed. In particular the impact of the proposed development should be assessed, where applicable, with regard to:

- Natura 2000 sites, i.e. Special Areas of Conservation (SAC) designated under the EC Habitats Directive (Council Directive 92/43/EEC) and Special Protection Areas designated under the EC Birds Directive (Directive 2009/147 EC),
- Other designated sites, or sites proposed for designation, such as Natural Heritage Areas, Nature Reserves and Refuges for Fauna or Flora, designated under the Wildlife Acts of 1976 and 2000,
- Habitats listed on annex I of the Habitats Directive,
- Species listed on Annexes II and IV of the Habitats Directive,
- Habitats important for birds,
- Birds listed on Annex I of the EC Birds Directive,
- Species protected under the Wildlife Acts including protected flora,
- Habitats that can be considered to be corridors or stepping stones for the purpose of article 10 of the Habitats Directive,
- Red data book species,
- and biodiversity in general.

In order to assess the above impacts it may be necessary to obtain hydrological and/or geological data. In particular any impact on water table levels or groundwater flows may impact on wetland sites some distance away. The EclS should assess cumulative impacts with other plans or projects if applicable. Where negative impacts are identified suitable mitigation measures should be detailed if appropriate. As member States have to report every 6 years on the National resource of habitats and species listed under the Habitats Directive it is important that any impact on such habitats and species both inside and outside of Natura 2000 sites is recorded.

Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Acts or derogations under the Habitats Regulations. In particular bats and otters are strictly protected under annex IV of the Habitats Directive and a copy of Circular Letter NPWS 2/07 entitled "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 – strict protection of certain species/applications for derogation licences" can be found on our web site at <http://www.npws.ie/media/npws/publications/circulars/media.6686.en.pdf>. In addition licenses will be required if there are any impacts on other protected species or their resting or breeding places, such as on protected plants, badger setts or birds nests. Hedgerows should be maintained where possible. Where trees or hedges have to be removed there should be suitable planting of native species in mitigation. The EclS should estimate the length of hedgerow that will be lost, if any. Where possible hedges and trees should not be removed during the nesting season (i.e. March 1st to August 31st). Birds' nests can only be intentionally destroyed under licence issued under the Wildlife Acts of 1976 and 2000. In order to apply for any such licenses or derogations as mentioned above a detailed survey should be submitted to NPWS which should have been carried out by appropriately qualified person/s. Such licences should be applied for in advance of planning to avoid delays and in case project modifications are necessary.

Should the original survey work take place well before construction commences it is recommended that an ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the baseline ecological survey has occurred. If there has been any significant change mitigation may require amendment and there may be a need for new licence applications with regard to protected species. In such a case NPWS should be consulted.

You should refer to the various circular letters issued by the National Parks and Wildlife Service of this Department which can be found at <http://www.npws.ie/planning/appropriateassessment/> In particular Circular Letter PD 2/07 and NPWS 1/07 on the use of compliance conditions is relevant and in order to allow for a complete assessment, it is essential that any mitigation measures detailed in the EclS and/or NIS form part of a construction management plan which must be implemented by the successful contractor at construction phase. This must be detailed in the EclS/NIS. It is not possible to adequately assess the impact of the project without knowing the minimum standards and mitigation measures that will be in any construction methodology or plans.

Appropriate Assessment

In accordance with article 6.3 of the Habitats Directive, this project should be subject to appropriate assessment screening and if necessary appropriate assessment.

Some Guidance documents are referred to below which may help. However CJEU case law has to some extent clarified certain issues. In particular you or your ecologist should refer to case C-258/2011- N6 Galway City Outer Bypass. As a result of this permanent loss of a habitat for which a site has been designated has been established to mean that there is a significant effect on the site. Therefore it is the view of this Department that if any loss of a habitat or habitat of a species for which the site is designated cannot be ruled out with certainty at screening, the likelihood of an adverse effect on the integrity of the site must be assumed, thus proceeding to appropriate assessment.

Guidance on AA is available in the Departmental guidance document on Appropriate Assessment, which is available on the NPWS web site at <http://www.npws.ie/media/npws/publications/codesofpractice/AA%20Guidance%2010-12-09.pdf> and in the EU Commission guidance entitled "*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*" which can be downloaded from http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf

A rule of thumb often used is to include all Natura 2000 sites within a distance of 15km. It should be noted however that this will not always be appropriate. In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included.

In order to carry out the appropriate assessment screening and/or prepare a NIS you will need to collect information about the relevant Natura 2000 sites including their conservation objectives. Details of designated sites and species and conservation objectives can be found on www.npws.ie. Site-specific, as opposed to generic, conservation objectives are now available for some sites. Each conservation objective is defined by a list of attributes and targets. Where these are not available for a site it is recommended that you look at the detailed conservation objectives for other sites which have the same qualifying interests. For example if a site without detailed conservation objectives has otters as a qualifying interest you could refer to the River Barrow and River Nore SAC detailed conservation objectives to see how otters are treated. You might also note that it is now advised, as per the notes and guidelines in the detailed conservation objectives, that any reports quoting conservation objectives should give the version number and date. This will allow

statutory consultees and others assessing reports to be confident that the correct and most up to date version of the conservation objectives are used at the time of writing any report.

Since this proposed development will involve works near the river Barrow the Department advises the applicant to include methods in the EclS/NIS to prevent sediments and other substances entering the river. It should be made clear in the NIS that these will be included in the construction environmental management plan for the works. As stated above it is not possible to adequately assess the impact of the project without knowing the minimum standards and mitigation measures that will be in any construction methodology or plans.

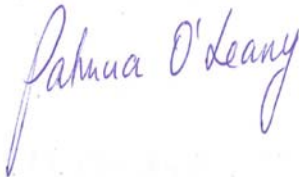
It is recommended that you consult with the relevant Local Authorities to determine if there are any projects or plans which alone or in combination could impact on any Natura sites. In addition if the National Cycle Network Scoping Study 2010 was not adequately assessed for cumulative impacts then this should now be done.

The acknowledgement to this letter, any further information and/or the planning authority's decision should ideally be sent to manager.dau@ahg.gov.ie; if this is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in his role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas



Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482
e manager.dau@ahg.gov.ie