Natura Impact Statement (NIS)

Proposed Authorised Treatment Facility and Storage Area at a site at Union Road, Collooney, Co. Sligo

Report For:

SF Waste Management Ltd.

Prepared By:

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Date:

24th October 2022

Project No. 15261

Report No. 15261-01 REV.B

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1.0 INTRODUCTION

1.1 Project Background

It is understood that SF Waste Management Ltd. intend to apply to Sligo County Council for an authorised treatment facility and the storage of vehicles pending collection and all associated axillary works at a site at Union Road, Collooney, Co. Sligo. Consequently, Hydrec Environmental Consulting were engaged by Environmental Consultancy Services on behalf of the applicant to prepare a Natura Impact Statement (N.I.S) for the aforementioned project. This NIS has been prepared in accordance with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora; the Planning and Development (Amendment) Act 2010; and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

1.2 Statement of Competence

Patrick McCabe is a graduate of University College Dublin with a BSc in Applied Environmental Science. Additionally, Patrick has graduated from Dundalk Institute of Technology (Centre for Freshwater Studies) with a MSc focusing on freshwater ecology and catchment science / hydrology. He has over 9 years' experience in environmental consultancy, acting as project manager on a range of ecological and hydrological assessments within the agricultural, industrial, residential and waste sectors. Patrick has also spoke on such topics at a number of national conferences (e.g. International Association of Hydrogeologists (IAH), Irish Group, Annual Conference 2021) and given guest lectures on the subject to third level education institutions (e.g. NUI Galway - MSc Programme in "Marine and Freshwater Resources: Management, 2022).

1.3 Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the "Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment (AA):

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6(4) states:

If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to: human health or public safety; beneficial consequences of primary importance for the environment; or, further to an opinion from the Commission, other imperative reasons of overriding public interest.

These articles mean that where the implementation of the proposed development has potential to have a significant effect on a Natura 2000 site, the relevant Competent Authority must ensure that an appropriate assessment is carried out in view of that site's conservation objectives. The proposed development can only be approved by the relevant Competent Authority if it has been ascertained that it will not adversely affect the integrity of the Natura 2000 site(s) concerned, or in the case of a negative assessment and where there are no alternative solutions, the scheme can only be approved for reasons of overriding public interest.

1.4 Stages of Appropriate Assessment

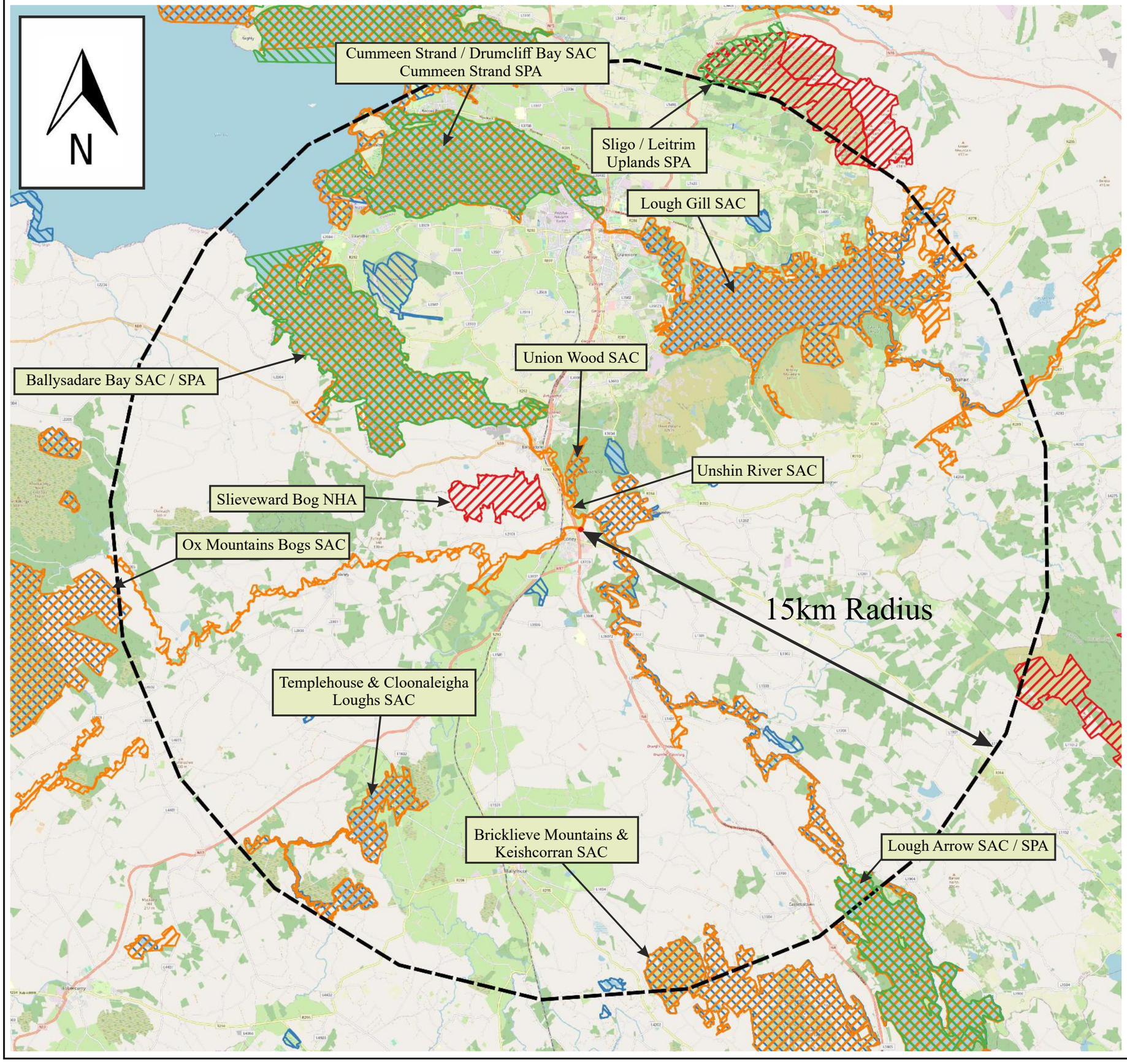
There are up to 4 stages in the Appropriate Assessment process as outlined in the European Commission Guidance document (EC, 2001). The following is a summary of these stages (each of which is dependent on the outcome of the previous):

- Stage 1 - Screening: This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 Site and considers whether it can be objectively concluded that these effects will not be significant.
- Stage 2 - Appropriate Assessment: In this stage, the impact of the project on the integrity of a Natura 2000 site is considered with respect to the conservation objectives of the site and to its structure and function.
- Stage 3 - Assessment of Alternative Solutions: Should the Appropriate Assessment determine that adverse impacts are likely upon a Natura 2000 site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts.
- Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the Natura 2000 site will be necessary.

1.5 Identification of Relevant Natura 2000 Sites

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest' is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

Figure 1. illustrates all Natura 2000 sites situated within 15km of the proposed development. The use of a 15km radius from the proposed site is in line with current best practice and guidance (DEHLG, 2010). As can be seen from Figure 1. there are fourteen Natura 2000 sites within a 15km radius of the site (see Table 1).



LEGEND

- Special Area of Conservation
- Special Protection Area
- National Heritage Area
- proposed National Heritage Area

HYDREC ENVIRONMENTAL CONSULTING

PROJECT:

Natura Impact Statement -
SF Waste Management Ltd.

TITLE:

Identification of Natura 2000 Sites within a 15km Radius of the Proposed Development

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Figure 1.	0

Table 1. Distance of Natura 2000 Sites from the Proposed Development

Natura 2000 Sites	Distance
Unshin River SAC	10m
Union Wood SAC	0.9km
Ballysadare Bay SAC	3.6km
Ballysadare Bay SPA	3.7km
Lough Gill SAC	6.2km
Templehouse & Cloonacleigha Loughs SAC	9.4km
Cummeen Strand / Drumcliff Bay (Sligo Bay) SAC	9.6km
Cummeen Strand SPA	9.9km
Bricklieve Mountains & Keishcorran SAC	13.2km
Lough Arrow SAC	13.4km
Lough Arrow SPA	13.6km
Drumcliff Bay SPA	14.3km
Ox Mountains Bogs SAC	14.6km
Sligo / Leitrim Uplands SPA	14.8km

While Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA) do not form part of the Natura 2000 network, they can provide an important supporting function, particularly to fauna species that are not confined within the boundaries of an attributed SPA / SAC (e.g. certain bird species). Therefore, in order to protect the European network, it may also be a requirement to protect a designated NHA / p NHA. In addition, Article 10 of the Habitat's Directive places a high level of importance on such sites that connect the Natura 2000 network. Table 2 below identifies the closest NHA / pNHA's to the proposed development site.

Table 2. Distance of NHA & pNHA Sites from the Proposed Development

Natural Heritage Areas	Distance
Unshin River pNHA (001898)	400m
Union Wood pNHA (000638)	850m
Slieveward Bog NHA	1.35km
Knockmullin Fen pNHA (001904)	1.975km
Ballygawley Lough (pNHA – 001909)	2.075km
Lough Dargan (pNHA – 001906)	3.95km

1.6 Conclusion of Stage 1 – Screening Assessment

Given the proximity of the proposed development's northern boundary to the Owenmore River / Unshin River SAC, it was concluded that potential impacts arsing from the development could not be discounted at the screening stage (see Table 3). Consequently, it was determined that Appropriate Assessment (AA) – Stage 2 for the project was required. Ten of the Natura 2000 Sites located within a 15km radius of the site can be screened out at this juncture (see Table 3).

Table 3 Part A. Summary of Appropriate Assessment Screening Conclusions

Site Code	Site Name	Distance	Qualifying Features	Potential Impact	Requirement for N.I.S
:001898	Unshin River SAC	10m	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355]	Given the proximity of the site to the SAC, further assessment is warranted	Yes
:000638	Union Wood SAC	0.9km	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	Given the proximity of the SAC to the Ballysodare River, further assessment is warranted	Yes
:000622	Ballysadare Bay SAC	3.6km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] Phoca vitulina (Harbour Seal) [1365]	Given that the Owenmore River / Ballysodare River discharges into Ballysodare Bay, further assessment is warranted	Yes
:004129	Ballysadare Bay SPA	3.7km	Light-bellied Brent Goose (Branta bernicla hrota) [A046] Grey Plover (Pluvialis squatarola) [A141] Dunlin (Calidris alpina) [A149] Bar-tailed Godwit (Limosa lapponica) [A157] Redshank (Tringa totanus) [A162] Wetland and Waterbirds [A999]	Given that the Owenmore River / Ballysodare River discharges into Ballysodare Bay, further assessment is warranted	Yes

Table 3 Part B. Summary of Appropriate Assessment Screening Conclusions

Site Code	Site Name	Distance (m)	Qualifying Features	Potential Impact	Requirement for N.I.S
:001976	Lough Gill SAC	6.2km	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Austropotamobius pallipes (White-clawed Crayfish) [1092] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Lampetra fluviatilis (River Lamprey) [1099] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355]	There is no hydrological linkage between the proposed development site & the SAC. For instance, the proposed development location is situated within the Owenmore(Sligo)_SC_030 sub-catchment whilst the SAC is located within the Bonet_SC_030 sub-catchment.	No
:000636	Templehouse & Cloonacleigha Loughs SAC	9.4km	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	There is no hydrological linkage between the proposed development site & the SAC. For instance, the proposed development location is situated within the Owenmore(Sligo)_SC_030 sub-catchment whilst the SAC is located within the Owenmore(Sligo)_SC_020 sub-catchment.	No
:000623	Cummeen Strand / Drumcliff Bay (Sligo Bay) SAC	9.6km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Petrifying springs with tufa formation (Cratoneurion) [7220] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] Petromyzon marinus (Sea Lamprey) [1095] Lampetra fluviatilis (River Lamprey) [1099] Phoca vitulina (Harbour Seal) [1365]	There is no hydrological linkage between the proposed development site & the SAC. For instance, the proposed development location is situated within the Owenmore(Sligo)_SC_030 sub-catchment whilst the SAC is located within the Drumcliff_SC_010 sub-catchment.	No

Table 3 Part C. Summary of Appropriate Assessment Screening Conclusions

Site Code	Site Name	Distance (m)	Qualifying Features	Potential Impact	Requirement for N.I.S
:004035	Cummeen Strand SPA	9.9km	Light-bellied Brent Goose (Branta bernicla hrota) [A046] Oystercatcher (Haematopus ostralegus) [A130] Redshank (Tringa totanus) [A162] Wetland and Waterbirds [A999]	There is no hydrological linkage between the proposed development site & the SPA. For instance, the proposed development location is situated within the Owenmore(Sligo)_SC_030 sub-catchment whilst the SPA is located within the Drumcliff_SC_010 sub-catchment.	No
:001656	Bricklieve Mountains & Keishcorran SAC	13.2km	Turloughs [3180] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) [8120] Euphydryas aurinia (Marsh Fritillary) [1065] Austropotamobius pallipes (White-clawed Crayfish) [1092]	No record of designated species or habitats found within 1km from the proposed development site. Additionally, the proposed development is a considerable distance from the Natura 2000 site.	No
:001673	Lough Arrow SAC	13.4km	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]	There is no hydrological linkage between the proposed development site & the SAC. For instance, the proposed development location is situated within the Erne_SC_050 sub-catchment whilst the SAC is located within the Unshin_SC_010 sub-catchment.	No
:004050	Lough Arrow SPA	13.6km	Little Grebe (Tachybaptus ruficollis) [A004] Tufted Duck (Aythya fuligula) [A061] Wetland and Waterbirds [A999]	There is no hydrological linkage between the proposed development site & the SPA. For instance, the proposed development location is situated within the Erne_SC_050 sub-catchment whilst the SPA is located within the Unshin_SC_010 sub-catchment.	No

Table 3 Part D. Summary of Appropriate Assessment Screening Conclusions

Site Code	Site Name	Distance (m)	Qualifying Features	Potential Impact	Requirement for N.I.S
:004013	Drumcliff Bay SPA	14.3km	Sanderling (Calidris alba) [A144] Bar-tailed Godwit (Limosa lapponica) [A157] Wetland and Waterbirds [A999]	There is no hydrological linkage between the proposed development site & the SPA. For instance, the proposed development location is situated within the Owenmore(Sligo)_SC_030 sub-catchment whilst the SPA is located within the Drumcliff_SC_010 sub-catchment.	No
:002006	Ox Mountains Bogs SAC	14.6km	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] Vertigo geyeri (Geyer's Whorl Snail) [1013] Saxifraga hirculus (Marsh Saxifrage) [1528]	No record of designated species or habitats found within 1km from the proposed development site. Additionally, the proposed development is a considerable distance from the Natura 2000 site.	No
:004187	Sligo / Leitrim Uplands SPA	14.8km	Peregrine (Falco peregrinus) [A103] Chough (Pyrrhocorax pyrrhocorax) [A346]	No record of designated species or habitats found within 1km from the proposed development site. Additionally, the proposed development is a considerable distance from the Natura 2000 site.	No

2.0 METHODOLOGY

2.1 Legislation & Guidance Documents

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

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government;
- Managing Natura 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, referred to as MN2000, European Commission 2018;
- 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, referred to as the "EC Article 6 Guidance Document (EC2000); and
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission.
- Fossitt, J. (2000) A Guide to Habitats in Ireland;
- Smith et. al. (2011) Best practice guidance for habitat survey and mapping; and
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. September 2018;

3.0 DESCRIPTION OF PROJECT

3.1 Site Description & Proposed Works

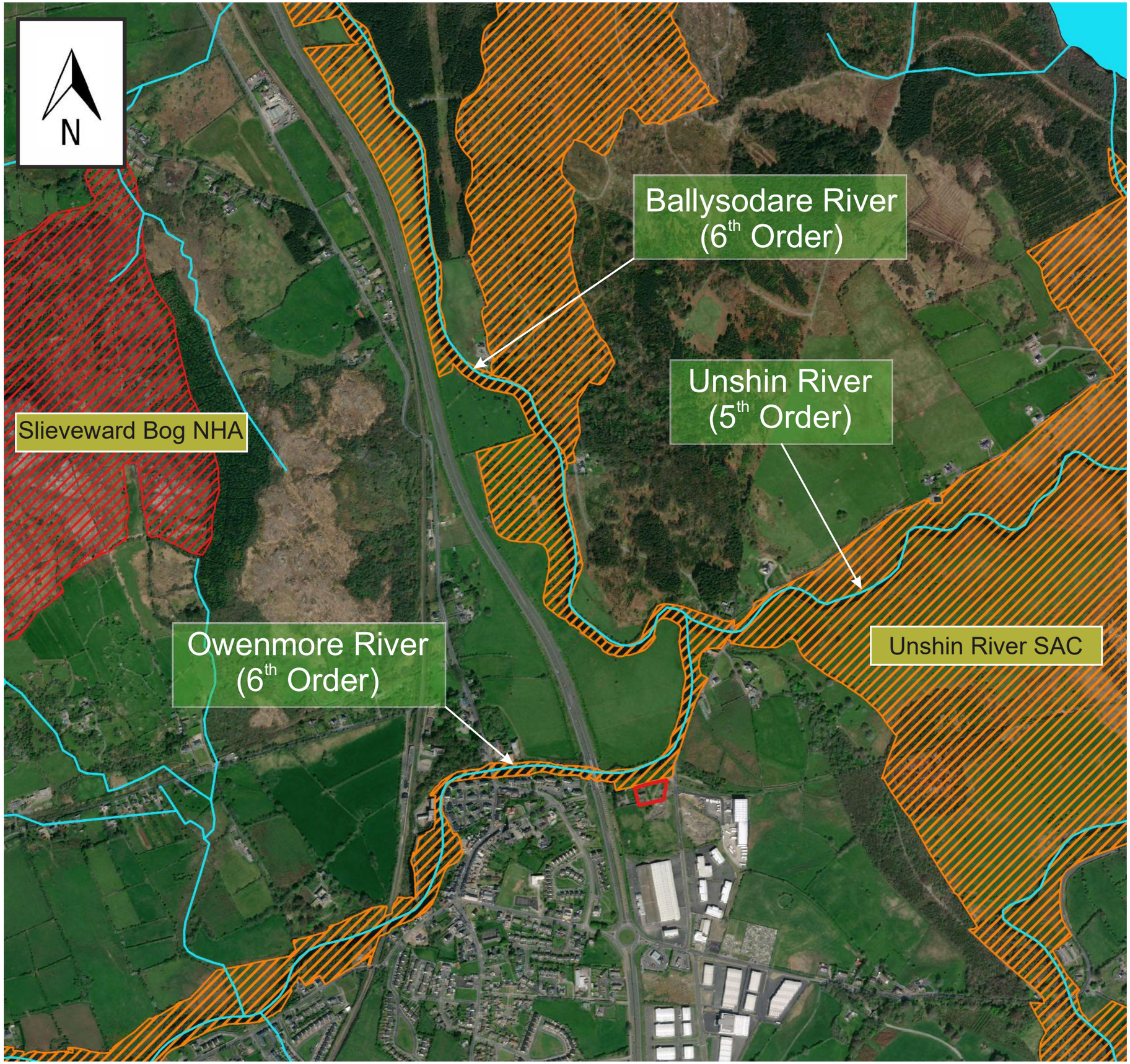
As mentioned previously, it is the intention of SF Waste Management Ltd. to apply for planning permission for an authorised treatment facility at a site at Union Road, Collooney, Co. Sligo. It is understood that works such as battery, catalytic convertor and alloy wheel removal will take place in the shed within the western portion of the site. All rainwaters emanating from the hardstand area to the front of said shed will be diverted through a silt trap and full retention interceptor. The outflow from this infrastructure will be piped via a direct feed into the Collooney Wastewater Treatment Plant (WWTP). The eastern portion of the site (i.e. area currently at a lower elevation) will be utilised for the storage of metal and depolluted vehicles pending collection.

3.2 Hydrology & Aquatic Ecology

With the publication of Ireland's second River Basin Management Plan (RBMP), the RBMP 2018 – 2021 defines the entirety of the island of Ireland as a single River Basin District (RBD). This single RBD has been broken down into 46 catchment management units. These units are mainly based on the hydrometric areas in use by the local authorities. Each of the 46 catchment management units have been further broken down into 583 sub-catchments. The proposed development site is located within the Sligo Bay Hydrometric Area and Sligo Bay WFD Catchment. Additionally, the site is located within the Owenmore (Sligo)_SC_030 WFD Sub-catchment.

The Owenmore River (6th Order) is closest watercourse to the project site and is located c. 25m to the north (see Figure 2). From there, the river flows in a northern orientation where it merges with the Unshin River (5th Order) c. 370m downstream to form the Ballysadare River (6th Order). According to the Western CFRAM Study, fluvial flooding is predicated to occur to different degrees along the Owenmore / Ballysadare River (please see CFRAM maps in Appendix 1).

The Biotic Index of Water Quality (BIWQ), better known as the Q-value, was developed in Ireland by the EPA. Q-values and water quality classes are assigned using a combination of habitat characteristics and structure of the macroinvertebrate community within the water body. Individual macroinvertebrates are ranked for their sensitivity to organic pollution and the Q-value is assessed based, primarily on their relative abundance within a biological sample. Macroinvertebrate sampling has been completed on the Owenmore River at numerous monitoring stations since the 1970's. A Q-Value of Q3-4 (i.e. 'Moderate' status) was recorded



LEGEND

Site Boundary

Stream / River

Lake

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PROJECT:

Natura Impact Statement -
SF Waste Management Ltd.

TITLE:

Hydrological features in the vicinity of the site

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Figure 2.	0

at the Owenmore River monitoring station (RS35O060900) in 2018 (approx. 150m downstream from the site). Further downstream, a Q-Value of Q4-5 (i.e. 'High' status) was recorded on the Ballysadare River in 2018. A 'High' status has been consistently recorded at that site since 2000.

3.3 Geology

According to the Teagasc and EPA soils map, MADE – man made soils are found within the western portion of the site. Within the eastern portion of the site (i.e. proposed storage areas), AminDW - Acid Deep Well Drained Mineral soils belonging to the Acid Brown Earths, Brown Podzolics soil group are found.

In Ireland, the parent material underlying the majority of the country is comprised of quaternary sediments with the remainder composed of bedrock outcrop. These quaternary sediments have resulted from glacial movement, melting and deposition. The Teagasc and EPA subsoil maps identify that MADE – made ground is found to underly the made soils in the western area, whereas TNSSs – shall & sandstone till subsoil is found in the remainder.

Based on the GSI's 1:100k bedrock formation mapping, the entirety of the site is underlain by the Dargan Limestone Formation which comprises of bioclastic limestone, sandy crinoidal biosparite & oolitic grainstone. Bedrock outcrops are not found within the curtilage of the site, with the closest identified c. 300m to the south-west. According to the National Karst Database, no karst features are present within the site's boundary or locality.

3.4 Hydrogeology

The Geological Survey of Ireland (GSI) have reviewed the 1,200 geological Formations and Members defined within the Republic of Ireland and reduced them into 27 'Rock Unit Groups' (RUGs) based on their hydrogeological properties and significance. Based on the GSI's generalised bedrock RUG mapping, the *Dinantian Pure Bedded Limestones* RUG exists within the entirety of the site. A Rkc – Regionally Important Karstified Aquifer is associated with this RUG and underlies the site.

Groundwater Vulnerability is a term used to represent the intrinsic geological and hydro-geological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of certain karst features. Groundwater is most at risk where

the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes. The entirety of the development site is classified as *'M – Moderate'* vulnerability. The groundwater underneath the site is within the Ballygawley Groundwater Body (GWB) and is classified as being of 'Good' status.

3.5 Terrestrial Ecology

A search of the National Parks and Wildlife Services (NPWS) and National Biodiversity Data Centre's (NBDC) online data records was undertaken to determine if any rare, threatened or protected flora and fauna species have been recorded within the site footprint or its surrounds. Based on these records, no species of note were identified within the curtilage of the site.

This search was expanded to a 1km radius from the site. Based on these records, six species of note were recorded within this zone, namely:

- Common Frog (*Rana temporaria*);
- Daubenton's Bat (*Myotis daubentonii*);
- Eurasian Badger (*Meles meles*);
- European Otter (*Lutra lutra*);
- Pine Marten (*Martes martes*); and
- Soprano Pipistrelle (*Pipistrellus pygmaeus*).

4.0 STAGE 2 – APPROPRIATE ASSESSMENT

4.1 Description of Identified Natura 2000 Site(s) Within Zone of Influence

4.1.1 Unshin River SAC (Site Code: 001898)

The Unshin River runs from Lough Arrow north to Ballysadare Bay, Co. Sligo. The river is largely undrained and unaltered along much of its course where it flows across a number of geological boundaries between sandstone, shales and limestone. This results in unusual physico-chemical qualities which in turn are reflected in the rich and varied plant and animal populations. 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):

- [3260] Floating River Vegetation
- [6210] Orchid-rich Calcareous Grassland*
- [6410] Molinia Meadows
- [91E0] Alluvial Forests*
- [1106] Atlantic Salmon (*Salmo salar*)
- [1355] Otter (*Lutra lutra*)

4.1.2 Union Wood SAC (Site Code: 000638)

Union Wood is located on the eastern bank of the Ballysadare River between Ballysadare and Collooney in Co. Sligo. The site contains old oak woodland which is typical of western Oak wood (*Blechno-Quercetum*) and one of the best remaining in the region. 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):

- [91A0] Old Oak Woodlands

4.1.3 Ballysadare Bay SAC (Site Code: 000622)

Ballysadare Bay extends for about 10 km westwards from the town of Ballysadare, Co. Sligo, and is the most southerly of three inlets of the larger Sligo Bay. The bay is underlain by sedimentary rocks of limestones, sandstones and shales, which are exposed as low cliffs and small sections of bedrock shore at several locations. 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
- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2190] Humid Dune Slacks
- [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*)
- [1365] Common (Harbour) Seal (*Phoca vitulina*)

4.1.4 Ballysadare Bay SPA (Site Code: 004129)

The extensive intertidal sand and mudflats at the bay support good populations of macro-invertebrates which are important food items for wintering waterfowl. Also present on the intertidal flats are the vascular plants Eelgrass (*Zostera marina*) and Beaked Tasselweed (*Ruppia maritima*), which provide food for herbivorous wildfowl. Well-developed salt marshes, which provide roosting sites for birds at high tide, occur at several locations around the bay. The sandy beaches around the Strandhill peninsula are used by roosting birds. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species:

- [A046] Light-bellied Brent Goose (*Branta bernicla hrota*)
- [A141] Grey Plover (*Pluvialis squatarola*)
- [A149] Dunlin (*Calidris alpina*)
- [A157] Bar-tailed Godwit (*Limosa lapponica*)
- [A162] Redshank (*Tringa totanus*)
- [A999] Wetland and Waterbirds

4.2 Impact Prediction

4.2.1 Potential for Direct Impacts on NATURA 2000 Sites

The proposed development site is not situated within any SAC or SPA, therefore no direct impacts will occur through land take / habitat loss or fragmentation of habitats.

On the 05th of October 2022, Patrick McCabe of Hydrec Environmental Consulting conducted a walkover study of the site to assess its ecological condition. The dominant habitat type recorded was 'Buildings and artificial surfaces - BL3' with an 'Earth banks - BL2' habitat recorded on the site's eastern and south-eastern boundaries. Considering the designated habitats associated with the Unshin River SAC, no Molina Meadow, Orchid Rich Calcareous Grassland or Alluvial Forrest habitats are found within or in close proximity to the site. Such habitats are found c. 1.15km (Molina Meadow), 900m (Orchid Rich Calcareous Grassland) and 1.2km (Alluvial Forrest) in distance from the proposed development site. Given the habitats recorded

onsite, it is not envisaged that suitable conditions exist for any of the protected fauna recorded within a 1km radius of the site. For instance, there is no ponds, grassland, woodland, hedgerows or scrub present to support the Common Frog (*Rana temporaria*), Daubenton's Bat (*Myotis daubentonii*), Pine Marten (*Martes martes*) or Soprano Pipistrelle (*Pipistrellus pygmaeus*).

Furthermore, owing to the fact that there have been recordings of the Eurasian Badger (*Meles meles*) within 1km of the site, a survey for badger setts was undertaken with a particular focus placed on the bordering earthen bank habitat. There was no evidence of badger habitat or activity (e.g. badger latrines) recorded within the confines of the site during the time of the survey (October 2022).

4.2.2 Potential for Indirect & Secondary Impacts on NATURA 2000 Sites

Indirect impacts can occur where there is a viable pathway between the source (i.e. the proposed development site) and the receptor (i.e. the habitats and species for which a Natura 2000 site has been designated). Common pathways for impacts include surface water and groundwater contamination, air (e.g. airborne dust or noise) and land (e.g. overland flow or vibration).

It is understood that no surface water discharges are proposed for the development. It is proposed that all stormwaters generated from the concrete hardstand area to the front of the process shed (i.e. alloy wheel removal area) will be diverted through a silt trap and sufficiently sized oil water interceptor. The discharge from the interceptor will be piped to the existing foul water infrastructure which directly feeds into the new Collooney Wastewater Treatment Plant (WWTP) directly to the west of the applicant's site. Consequently, there will be no increase in suspended solid concentrations / alteration of *Ranunculus fluitans* habitat, no sedimentation of Atlantic Salmon (*Salmo salar*) spawning beds or alteration of the physico-chemical conditions of the watercourse (i.e. reduction in oxygen or change in pH concentrations). Thus, there will be no direct / indirect impact on the water quality of the Owenmore River / Unshin SAC or the wider Natura 2000 network as a result (i.e. downstream Union Wood SAC, Ballysadare SAC / SPA).

Given the distance separating the site and the aforementioned Natura 2000 site, it is not anticipated that the floral assemblage found within the Unshin River SAC / Union Wood SAC will be impacted via indirect pathways (e.g. air pollution / dust). Similarly, given the distance from the site to the closest otter record (i.e. recorded c.300m to the west, as part of the *Atlas of Mammals in Ireland 2010-2015*), it is not predicated that noise impacts will have an adverse effect during either the construction or operational phases of the facility.

As mentioned previously, the entirety of the development site is classified as *'M – Moderate'* vulnerability. It is proposed to store metal and depolluted vehicles within the eastern portion of the site on a gravel material. Thus, the risk of groundwater contamination and subsequent pollution of the Owenmore River / Unshin SAC via the subsurface / baseflow pathway is low. As mentioned previously, fluvial flooding from the Owenmore River is predicated to occur under the 1 in 100-year event. A very small amount of flooding is predicated to encroach onto the proposed applicant's site (i.e. north-eastern area). Thus, mitigation measures which take account of these flood extents are described in Section 4.3.

Finally, the proposed project will not have a negative impact on any of the NHAs or pNHAs located in the proximately of the site. For instance, the Owenmore River which passes by the site does not flow through either Lough Dargan or Ballygawley Lough. Additionally, the proposed facility is situated within a different groundwater body to that of the Slieveward Bog NHA (Collooney GWB). Whilst both the site and the Knockmullin Fen are both located within the Ballygawley GWB, groundwater flow within the site is anticipated to flow towards the Owenmore River and therefore away from the fen (i.e. hydrogeologically downgradient).

4.2.3 Cumulative Effects

It is a requirement of the Appropriate Assessment process that the combined effects of the proposed development together with other plans or projects be assessed. Accordingly, a number of other projects have been considered in order to determine if cumulative impacts exist. A search of all planning applications with a Union Road address, submitted to Sligo County Council within the last two years has been completed. It was determined that the development density in the area was low with two other planning applications granted planning permission within this timeframe. Additionally, one further planning application is currently going through the planning process. These included:

- 20399 – Development consisting of the following; permission for subdivision of Unit No. 9 (total floor area 1726 m2) into 2 separate units and all associated works;
- 21428 – Development consisting of the change of use of existing warehouse unit, permitted under PL04/1470 to use as an Educational Training Centre with all associated works; and
- 22228 – Development consisting of: (1) change of use to part of the undertakers business to use as a funeral home and crematorium, (ii) construction of a first floor mezzanine and stairs to be used as offices and storage ancillary to the business, (iii) proposed changes to fenestration to the front, south side and rear elevations to accommodate these changes, (iv) change of cladding to the first floor facades of the

front and side elevations with window surrounds and louvres, (v) construction of a veranda to the front and south side, (vi) construction of a porte conchere to front entrance, (vii) proposed gas tank and air cooler unit in 2m high walled area located to the south, (viii) carrying out of all ancillary site works

Like the proposed development, none of the aforementioned projects are located within or indeed adjacent to the Unshin River SAC. Consequently, no direct impacts will occur through land take / habitat loss or fragmentation of habitats. Each of the aforementioned developments are also situated >230m to the south (i.e. away from applicant's site & SAC) thus a cumulative noise impact is not anticipated.

An Appropriate Assessment Screening Report was prepared as part of the planning application for the upgrade to the Collooney WWTP in 2017. The AA Screening concluded that the project would have no adverse effects on any Natura 2000 site, their qualifying interests, conservation objectives or integrity. As part of the assessment, it was determined that the Owenmore River had sufficient assimilative capacity to cater for the BOD, ammonia and orthophosphate concentrations scheduled for discharge. Given that there will be no surface water discharge from the applicant's site an increase in BOD or nutrient concentrations will not occur and thus the assimilate capacity of the river will not change as a consequence of the proposed project.

It was therefore concluded that no cumulative impacts are predicated with any in-combination impacts associated with neighbouring developments deemed to be negligible and insignificant.

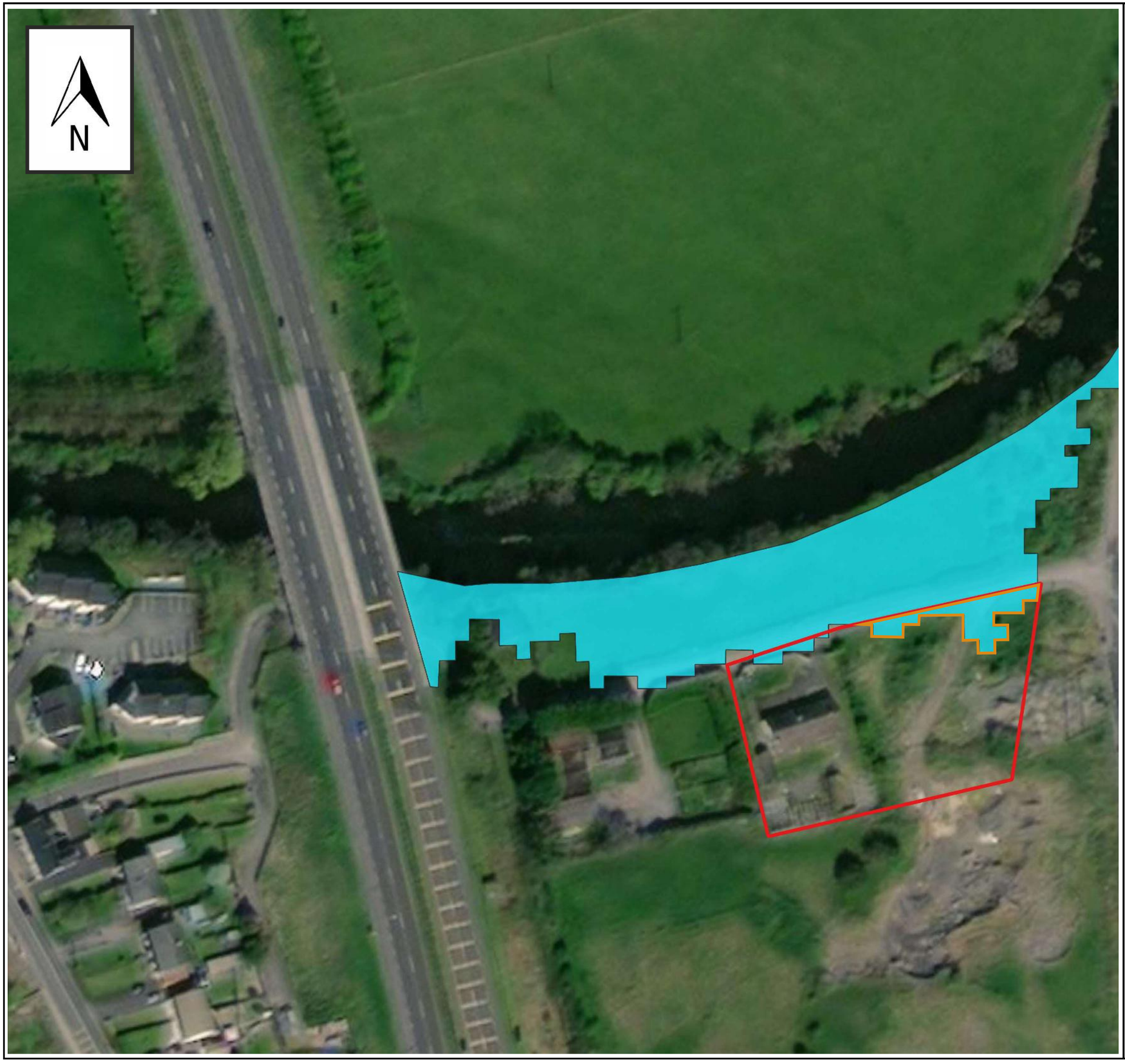
4.3 Mitigation Measures

The following mitigation measures should be adhered too, in order to ensure that any direct or indirect impacts on the Unshin River SAC and downstream European designated sites are abated;

- An adequate supply of spill kits and hydrocarbon adsorbent packs should be available onsite;
- The proposed surface water drainage infrastructure (i.e. silt trap and oil – water interceptor) should be routinely maintained and de-sludged; and

- No depolluted cars or metal should be stored within the 1% AEP flood extent as defined on Figure 3. It is understood from reviewing the CFRAM Ballysadare Flood Extent mapping that the 1 in 100-year flood level recorded downstream from the site (Node: 35OMIL00034) equates to an elevation of 25.92m AOD. It should be noted that the storage of material outside these flood extents is precautionary in nature and indicative of conditions under an extreme weather event. No flooding is predicated to occur at the site under the 1 in 10-year event (i.e. 10% AEP).

In light of adherence to the mitigation measures set out previously, adverse residual impacts are anticipated to be negligible. Thus, residual impacts will not result in any significant effects on the important ecological features / receptors within the Zone of Influence of the project or the wider Natura 2000 network.



LEGEND

Site Boundary

CFRAM 1% AEP Flood Extent

Area whereby storage of vehicles should not occur

HYDREC
ENVIRONMENTAL CONSULTING

PROJECT:

Natura Impact Statement -
SF Waste Management Ltd.

TITLE:

CFRAM 1 in 100-year Flood Extents (i.e. south of Owenmore River only)

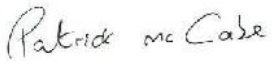
SCALE:	DRAWN BY:
1:1,000@A3	PMcC
DRAWING NO:	**REV.**
Figure 3.	0

5.0 CONCLUSIONS

This Natura Impact Statement (NIS) has identified the particular types of effect that have potential for adverse impact on the integrity of the Unshin River SAC and downstream European Designated Sites. Additionally, an assessment on the impact on the local ecology has been undertaken. This statement identifies mitigation measures that will ensure avoidance of these effects; so that the structure and functions of the Natura 2000 Network and local ecology / biodiversity are not affected.

Following a comprehensive evaluation of the potential direct, indirect and residual impacts, it is considered that the proposed works either independently or in combination with other plans, does not have the potential to significantly affect the conservation objectives of any Natura 2000 Site. A checklist of Natura 2000 site integrity is included in Table 4, which states that the designated sites, will not be affected by the proposed development works.

Signed:



Patrick McCabe B.Sc., M.Sc.

(P.I insurance available on request)

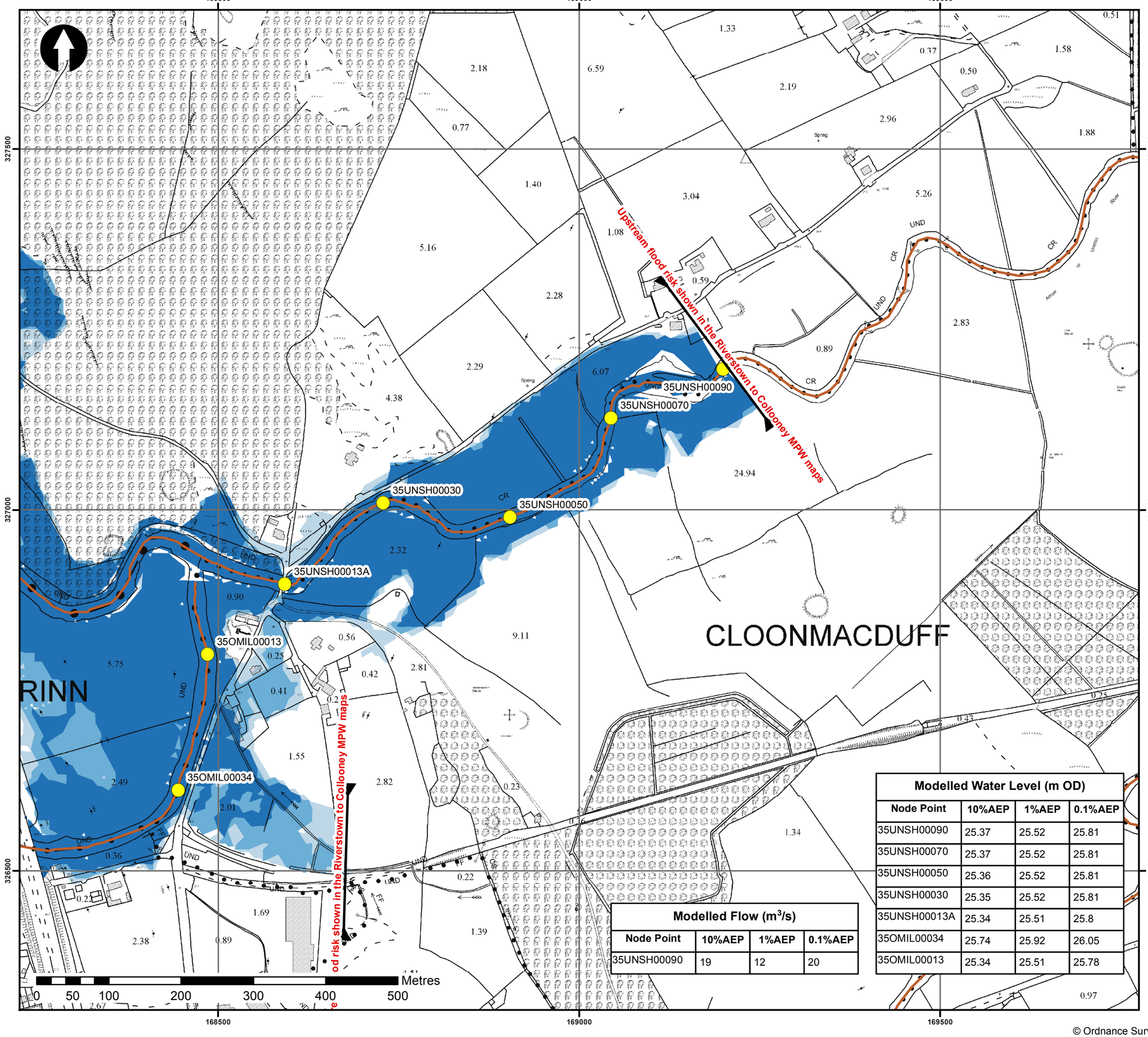
Table 4. Integrity of Site Checklist (In Accordance with Box 10 of Methodological Guidance on the Provisions of Article 6(3) (4) of the Habitats Directive 92/43/EEC)

CONSERVATION OBJECTIVES DOES THE PROJECT OR PLAN HAVE THE POTENTIAL TO BE:	YES / NO
Cause delays in progress towards achieving the conservation objectives of the site?	NO
Interrupt progress towards achieving the conservation objectives of the site?	NO
Disrupt those factors that help to maintain the favourable conditions of the site?	NO
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	NO
OTHER INDICATORS **DOES THE PROJECT OR PLAN HAVE THE POTENTIAL TO BE:**	**YES / NO**
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	NO
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	NO
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	NO
Reduce the area of key habitats?	NO
Reduce the population of key species?	NO
Change the balance between key species?	NO
Reduce diversity of the site?	NO
Result in disturbance that could affect population size or density or the balance between key species?	NO
Result in fragmentation?	NO
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	NO

APPENDIX 1

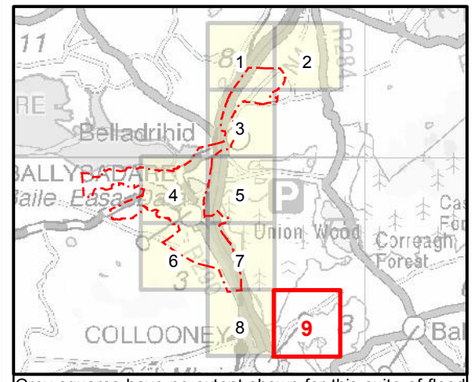
WESTERN CFRAM STUDY – BALLYSADARE FLOOD EXTENT MAP

WESTERN CFRAM STUDY – BALLYSADARE FLOOD DEPTH (1% AEP) MAP



Modelled Flow (m^3/s)			
Node Point	10%AEP	1%AEP	0.1%AEP
35UNSH00090	19	12	20

Modelled Water Level (m OD)			
Node Point	10%AEP	1%AEP	0.1%AEP
35UNSH00090	25.37	25.52	25.81
35UNSH00070	25.37	25.52	25.81
35UNSH00050	25.36	25.52	25.81
35UNSH00030	25.35	25.52	25.81
35UNSH00013A	25.34	25.51	25.8
35OMIL00034	25.74	25.92	26.05
35OMIL00013	25.34	25.51	25.78



Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

AFA Boundary

Model Nodes

Modelled River Centreline

10% AEP Fluvial Extent

1% AEP Fluvial Extent

0.1% AEP Fluvial Extent

IMPORTANT USER NOTE:
THE FLOWS PRESENTED IN THIS MAP ARE RELEVANT TO THE LOCATION SHOWN ONLY. THEY SHOULD NOT BE USED WITHOUT FIRST REFERRING TO THE HYDRAULIC MODELLING REPORT TO UNDERSTAND THE CONTEXT OF THE HYDROLOGY AT THE SITE.

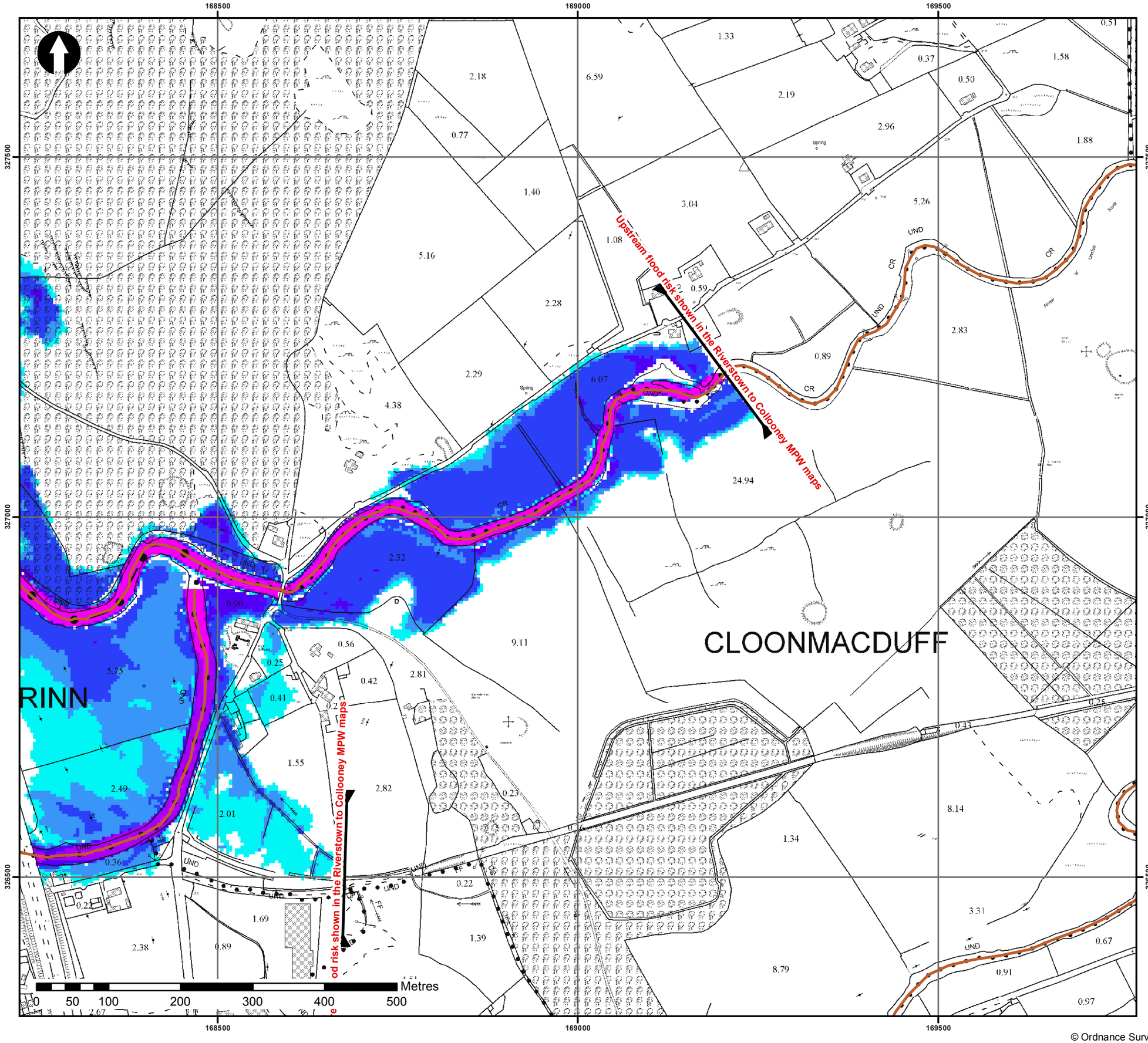
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

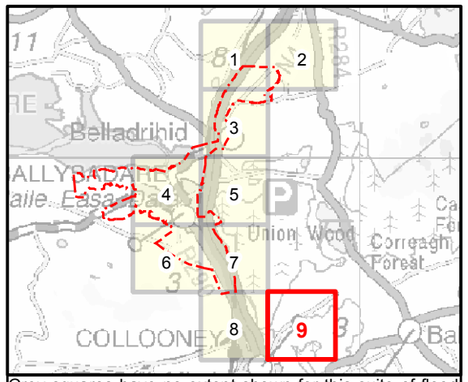
The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

JBA Consulting
24 Grove Island
Corbally
Limerick, Ireland

WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

Map: Ballysadare Flood Extent			Final
Map Type: Flood Extent			
Map Area: HPW		Source: Fluvial	Scenario: Current
Drawn by: DR	Date: Oct 2016	Scale: 1:5,000	
Checked by: JC	Date: Oct 2016		
Approved by: SPW	Date: Oct 2016	Original @ A3	
Map No: W35BLS_EXFCD_F3_09		**Sheet:** 9 of 9	





Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

AFA Boundary

Modelled River Centreline

1% AEP
Flood Depth (m)

- 0 - 0.25
- 0.25 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- > 2.0

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

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Co. Meath

JBA Consulting
24 Grove Island
Corbally
Limerick, Ireland

WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

Map: Ballysadare Flood Depth (1% AEP)			Final
Map Type: Flood Depth (1% AEP)			
Map Area: HPW		Source: Fluvial	Scenario: Current
Drawn by: DR	Date: Aug 2016	Scale: 1:5,000	
Checked by: JC	Date: Aug 2016		
Approved by: SPW	Date: Aug 2016		Original @ A3
Map No: W35BLS_DPFCD010_F1_09		**Sheet:** 9 of 9	

APPENDIX 2

CONSERVATION OBJECTIVES FOR UNSHIN RIVER SAC

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Unshin River SAC 001898

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: natureconservation@housing.gov.ie

Citation:

NPWS (2021) Conservation Objectives: Unshin River SAC 001898. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Series Editors: Rebecca Jeffrey and Christina Campbell
ISSN 2009-4086

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***

001898	Unshin River SAC
1106	Salmon *Salmo salar*
1355	Otter *Lutra lutra*
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*

Please note that this SAC is adjacent to Ballysadare Bay SAC (000622), Union Wood SAC (000638), Lough Arrow SAC (001673) and Lough Arrow SPA (004050). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjacent sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	1992
Title :	Owenmore River Catchment. Proposed Arterial Drainage Environmental Impact Assessment - Botanical and Ornithological Surveys
Author :	Goodwillie, R.N.; Buckley, P.; Douglas, C.
Series :	Unpublished report
Year :	1996
Title :	River Unshin – macrophyte community. Notes of records made during May 1996 RHS surveys
Author :	Holmes, N.T.H.
Series :	Unpublished report to NPWS
Year :	2006
Title :	Otter survey of Ireland 2004/2005
Author :	Bailey, M.; Rochford, J.
Series :	Irish Wildlife Manuals, No. 23
Year :	2007
Title :	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents. Article 17 forms and supporting maps
Author :	NPWS
Series :	Unpublished report to NPWS
Year :	2008
Title :	National survey of native woodlands 2003-2008
Author :	Perrin, P.M.; Martin, J.; Barron, S.; O'Neill, F.H.; McNutt, K.E.; Delaney, A.
Series :	Unpublished report to NPWS
Year :	2010
Title :	A provisional inventory of ancient and long-established woodland in Ireland
Author :	Perrin, P.M.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 46
Year :	2013
Title :	National otter survey of Ireland 2010/12
Author :	Reid, N.; Hayden, B.; Lundy, M.G.; Pietravalle, S.; McDonald, R.A.; Montgomery, W.I.
Series :	Irish Wildlife Manuals, No. 76
Year :	2013
Title :	Irish semi-natural grasslands survey 2007-2012
Author :	O'Neill, F.H.; Martin, J.R.; Devaney, F.M.; Perrin, P.M.
Series :	Irish Wildlife Manuals, No. 78
Year :	2013
Title :	Results of a monitoring survey of old sessile oak woods and alluvial forests
Author :	O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals, No. 71
Year :	2018
Title :	The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats
Author :	Martin, J.R.; O'Neill, F.H.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 102

Year :	in prep.
Title :	The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats
Author :	Daly, O.H.; O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals
Year :	in prep.
Title :	Floodplain and callows grasslands in Ireland
Author :	Martin, J.R.; O'Neill, F.H.; Daly, O.H.
Series :	Irish Wildlife Manuals

Other References

Year :	1982
Title :	Otter survey of Ireland
Author :	Chapman, P.J.; Chapman, L.L.
Series :	Unpublished report to Vincent Wildlife Trust
Year :	1991
Title :	The spatial organization of otters (*Lutra lutra*) in Shetland
Author :	Kruuk, H.; Moorhouse, A.
Series :	Journal of Zoology, 224: 41-57
Year :	1993
Title :	Notes on the flora of the Owenmore Catchment Cos Sligo (H28) and East Mayo (H26)
Author :	Douglas, C.; Goodwillie, R.; Mooney, E.
Series :	Irish Naturalists' Journal, 24(5): 218-220
Year :	2000
Title :	A guide to habitats in Ireland
Author :	Fossitt, J.A.
Series :	The Heritage Council, Kilkenny
Year :	2002
Title :	Reversing the habitat fragmentation of British woodlands
Author :	Peterken, G.
Series :	WWF-UK, London
Year :	2003
Title :	Ecology of watercourses characterised by Ranunculion fluitantis and Callitricho-Batrachion vegetation
Author :	Hatton-Ellis, T.W.; Grieve, N.
Series :	Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough
Year :	2006
Title :	Otters - ecology, behaviour and conservation
Author :	Kruuk, H.
Series :	Oxford University Press
Year :	2010
Title :	Otter tracking study of Roaringwater Bay
Author :	De Jongh, A.; O'Neill, L.
Series :	Unpublished draft report to NPWS

Year :	2010
Title :	Water Quality in Ireland 2007-2009
Author :	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
Series :	Environmental Protection Agency, Wexford
Year :	2013
Title :	Management strategies for the protection of high status water bodies
Author :	Ní Chatháin, B.; Moorkens, E.; Irvine, K.
Series :	Strive Report Series No. 99. EPA, Wexford
Year :	2013
Title :	Interpretation manual of European Union habitats- Eur 28
Author :	European Commission- DG Environment
Series :	European Commission
Year :	2015
Title :	Water Quality in Ireland 2010-2012
Author :	Bradley, C.; Byrne, C.; Craig, M.; Free, G.; Gallagher, T.; Kennedy, B.; Little, R.; Lucey, J.; Mannix, A.; McCreesh, P.; McDermott, G.; McGarrigle, M.; Ní Longphuirt, S.; O'Boyle, S.; Plant, C.; Tierney, D.; Trodd, W.; Webster, P.; Wilkes, R.; Wynne, C.
Series :	Environmental Protection Agency, Wexford
Year :	2016
Title :	A narrative for conserving freshwater and wetland habitats in England
Author :	Mainstone, C.; Hall, R.; Diack, I.
Series :	Natural England Research Reports Number 064
Year :	2016
Title :	Irish Vegetation Classification: Technical Progress Report No. 2
Author :	Perrin, P.
Series :	Report submitted to National Biodiversity Data Centre
Year :	2017
Title :	Water Quality in Ireland 2010-2015
Author :	Fanning, A.; Craig, M.; Webster, P.; Bradley, C.; Tierney, D.; Wilkes, R.; Mannix, A.; Treacy, P.; Kelly, F.; Geoghegan, R.; Kent, T.; Mageean, M.
Series :	Environmental Protection Agency, Wexford
Year :	2019
Title :	Water Quality in Ireland 2013-2018
Author :	O'Boyle, S.; Trodd, W.; Bradley, C.; Tierney, D.; Wilkes, R.; Ní Longphuirt, S.; Smith, J.; Stephens, A.; Barry, J.; Maher, P.; McGinn, R.; Mockler, E.; Deakin, J.; Craig, M.; Gurrie, M.
Series :	Environmental Protection Agency, Wexford
Year :	2021
Title :	The Status of Irish Salmon Stocks in 2020 with Catch Advice for 2021
Author :	Gargan, P.; Fitzgerald, C.; Kennedy, R.; Maxwell, H.; McLean, S.;Millane, M.
Series :	Report of the Technical Expert Group on Salmon (TEGOS) to the North-South Standing Scientific Committee for Inland Fisheries

Spatial data sources

Year :	2018
Title :	Grasslands Monitoring Survey 2015-2017
GIS Operations :	Dataset clipped to the SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	6210, 6410 (map 3)
Year :	2021
Title :	Floodplain and Callows Grasslands in Ireland
GIS Operations :	Dataset clipped to the SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	6410 (map 3)
Year :	Revision 2010
Title :	National Survey of Native Woodlands 2003-2008. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91E0 (map 4)
Year :	2018
Title :	Woodland Monitoring Survey 2017-2018
GIS Operations :	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91E0 (map 4)

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 Unshin River SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	Conservation objectives concentrate on the high conservation value sub-types of the habitat. Selection of the SAC was based on the vegetation communities of the Unshin River, which were described by Goodwillie et al. (1992) as of international importance, the Unshin being one of the few undrained limestone rivers in Ireland, and by Holmes (1996) as the 'best reach of a river for macrophytes ever experienced' having an 'unquestionably unique' combination of species. The SAC also includes much of the Owenbeg/Owenboy River and lower Owenmore. Goodwillie et al. (1992) described the site in detail. The Unshin flows out of Lough Arrow SAC, and Templehouse and Cloonacleigha Loughs SAC is upstream of the Owenboy on the Owenmore
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, the habitat is distributed throughout the alkaline Unshin River, which has many slow-flowing, deep and meandering stretches and some faster-flows, including low-falls/cascades (Goodwillie et al., 1992; Douglas et al., 1993; Holmes, 1996). The Owenbeg/Owenboy is also in the SAC and is a more base-poor mountain river subject to spates (Goodwillie et al., 1992). The Owenbeg joins the Owenmore above Collooney and the Unshin joins below Collooney. Further study of Irish rivers is needed to interpret the broad description of habitat 3260 which covers from upland bryophyte/macroalgal dominated to lowland depositing rivers with pondweeds and starworts (European Commission, 2013)
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	The Unshin flows from spring-fed Lough Arrow, and Holmes (1996) considered that the lake has a stabilising influence on the river's flow regime, as does the significant base-rich groundwater input. Goodwillie et al. (1992) described the broad flow regime of the Unshin as slow-moving over much of its length, but with two steeper stretches with falls/cascades. Deep, ponded sections occur in peat, meandering stretches through alluvium and some faster stony reaches. By contrast, the Owenbeg rises in the Ox Mountains and is a spatey river. A series of waterfalls occurs near Collooney below the confluence of the Owenmore and Owenbeg/boy Rivers. A natural 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)

Hydrological regime: groundwater discharge	Metres per second	Maintain appropriate hydrological regime	Carboniferous limestone and calcareous shale dominate the catchments and, as a result, groundwater makes a significant contribution to the rivers in the SAC, particularly the Unshin. As noted above, Holmes (1996) highlighted the stabilising effect of the significant base-rich groundwater input on the flow-regime of the Unshin, as well as its critical influence on the river's macrophytes. It is essential that the appropriate groundwater contributions necessary for the natural functioning of the habitat be maintained and that there is no significant disturbance of the catchments' groundwater regimes
Substratum composition: particle size range	Millimetres	Maintain appropriate substratum particle size range, quantity and quality, subject to natural processes	Goodwillie et al. (1992) described the Unshin, Owenbeg and Owenmore rivers. Fine particles dominate the slow-flowing Unshin, which also has stony stretches and bedrock cascades; peat occurs in the upper reaches. The Owenbeg has a gravel bed and peat is a significant feature of its valley. The Owenmore is flat, slow-moving, partly channelised and dominated by fine sediments. Although many high conservation value sub-types are dominated by coarse substrata and bedrock, certain sub-types, notably those associated with lake inflows/outflows, peatlands and groundwater inputs, such as those in this SAC, are dominated by fine substrata. The size and distribution of particles is largely determined by the river flow and geology. The chemical composition (particularly minerals and nutrients) of the substratum is also important. The quality of finer sediment particles is a notable driver of rooted plant communities
Water quality	Various	Maintain/restore appropriate water quality to support the natural structure and functioning of the habitat	Goodwillie et al. (1992) stated that the Unshin becomes more nutrient-rich as it approaches Collooney. Holmes (1996) also found, based on macrophyte trophic indicators, that the Unshin becomes more enriched as one moves downstream, and noted a significant deterioration below Newtown. By contrast, EPA Q values have generally improved in a downstream direction from Q3-4 or Q4 at Bellarush Bridge below Lough Arrow to Q4-5 at Ballygrania Bridge and, under the Water Framework Directive, a High Status objective applies to the lower Unshin. See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019, EPA river water quality reports (e.g. McGarrigle et al., 2010; Bradley et al., 2015; Fanning et al., 2017; O'Boyle et al., 2019) and Ní Chatháin et al. (2013)
Typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	Typical species have not been fully defined but may include higher plants, bryophytes, algae and invertebrates. Goodwillie et al. (1992), Douglas et al. (1993) and Holmes (1996) recorded macrophytes in the Unshin. All highlighted the exceptionally high species-richness and importance of the community. Holmes (1996) hadn't encountered such rich and unusual combinations of river plants (e.g. *Apium inundatum, Littorella uniflora, Oenanthe fluviatilis, Potamogeton praelongus*) on the British Isles or Europe and the Unshin had >30% more species than rivers of similar type in GB and Ireland; other species recorded include *Cinclidotus sp., Hygroamblystegium fluviatile, Pellia endiviifolia, Callitriche obtusangula, C. stagnalis, Hippuris vulgaris, Lemna minor, L. trisulca, Menyanthes trifoliata, Myriophyllum spicatum, Nuphar lutea, Potamogeton crispus, P. natans, P. pectinatus, P. praelongus, Ranunculus penicillatus* subsp. *penicillatus, Sparganium emersum, S. erectum*

Floodplain connectivity: area	Hectares	Maintain/restore the area of active floodplain at and upstream of the habitat	Holmes (1996) also recorded emergent and marginal species in the Unshin including *Berula erecta, Caltha palustris, Carex paniculata, Cicuta virosa, Comarum palustre, Geum rivale, Glyceria fluitans, Lysimachia vulgaris, Pedicularis palustris, Phalaris arundinacea, Phragmites australis, Ranunculus circinatus, R. flammula, R. lingua, Schoenoplectus lacustris, Typha latifolia, Veronica anagallis-aquatica*. River connectivity with the floodplain is important for the functioning of this habitat. Channels with a naturally functioning floodplain are better able to maintain habitat and water quality (Hatton-Ellis and Grieve, 2003). Floodplain connectivity is particularly important in terms of sediment sorting and nutrient deposition. High conservation value rivers are intimately connected to floodplain habitats and function as important wildlife corridors connecting otherwise isolated or fragmented habitats in the wider countryside (Hatton-Ellis and Grieve, 2003; Mainstone et al., 2016)
Riparian habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types	A number of areas of wet alluvial woodlands occur along the Unshin (see 91E0 objective in this volume). See Goodwillie et al. (1992) and Douglas et al. (1993) for information on the fringing habitats along the Unshin and Owenbeg/Owenboy Rivers, which included willow woodland, peatland, tall herb and reedgrass and reedswamp. Some of the riparian species recorded by Holmes (1996) are listed above. Riparian habitats are integral to the structure and functioning of rivers, even where not part of a floodplain. Fringing habitats contribute to the aquatic food web, provide habitat for life-stages of fish, birds and aquatic invertebrates, assist in the settlement of fine suspended material, protect banks from erosion and contribute to nutrient cycling. Shade may suppress algal growth and moderate temperatures. Equally, fringing habitats are dependent on rivers, particularly their water levels, and support wetland communities and species of conservation concern. See Mainstone et al. (2016)

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

To restore the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) in Unshin River 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	Some areas supporting species-rich calcareous grassland were surveyed as part of the Irish Semi-natural Grassland Survey (ISGS; O'Neill et al., 2013) and the Grasslands Monitoring Survey (GMS; Martin et al., 2018) within the sub-site Cloonmacduff (site code 1541), located just east of Collooney. An area of 1.9ha of the habitat was mapped by the GMS (Martin et al., 2018). See map 3. It is important to note that further unsurveyed areas may be present within this large SAC
Habitat distribution	Occurrence	No decline, subject to natural processes	Distribution based on the GMS (Martin et al., 2018). See map 3. The main areas of this habitat at the Cloonmacduff sub-site (code 1541) appear to be along the slopes of the hillocks which pepper the site. Note that further unsurveyed areas of the habitat may be present within this large SAC
Vegetation composition: positive indicator species	Number at a representative number of 2m x 2m monitoring stops; within 20m surrounding area of monitoring stops	At least 7 positive indicator species present in monitoring stop or, if 5–6 present in stop, additional species within 20m of stop; this includes at least two 'high quality' positive indicator species present in stop or within 20m of stop	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018), where the lists of positive indicator species, including high quality indicators, are also presented. A small number of additional positive indicators for upland examples of this habitat are also provided (Martin et al., 2018). These documents should be consulted for further details. The areas mapped as 6210 at Cloonmacduff (1541) were noted by ISGS (O'Neill et al., 2013) to be species-rich, with good cover and spread of positive indicator species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Negative indicator species collectively not more than 20% cover, with cover of an individual species not more than 10%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018), where the list of negative indicator species is presented
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species not more than 1%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Vegetation composition: woody species and bracken	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of woody species (except certain listed species) and bracken (*Pteridium aquilinum*) not more than 5%	Woody species that can occur above 5% cover are juniper (*Juniperus communis*), burnet rose (*Rosa spinosissima*), mountain avens (*Dryas octopetala*) and hoary rock-rose (*Helianthemum oelandicum*). However, cover of these species above 25% may indicate transition to another Annex I habitat such as Alpine and Boreal heaths (4060) or *Juniperus communis* formations (5130). Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Vegetation structure: broadleaf herb:grass ratio	Percentage at a representative number of 2m x 2m monitoring stops	Broadleaf herb component of vegetation between 40% and 90%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018). Broadleaf herb component of vegetation between 30% and 40% may be allowed to pass on expert judgement (Martin et al., 2018). Broadleaf herb cover was noted as being high at Cloonmacduff (1541) by the ISGS (O'Neill et al., 2013)
Vegetation structure: sward height	Percentage at a representative number of 2m x 2m monitoring stops	At least 30% of sward between 5cm and 40cm tall	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018). Sward height was low when the sub-site Cloonmacduff was surveyed by the GMS (Martin et al., 2018), due to sheep preferentially grazing drier parts of the sub-site (code 1541)

Vegetation structure: litter	Percentage cover at a representative number of 2m x 2m monitoring stops	Litter cover not more than 25%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Physical structure: bare soil	Percentage cover at a representative number of 2m x 2m monitoring stops	Not more than 10% bare soil	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Physical structure: grazing or disturbance	Area in local vicinity of a representative number of monitoring stops	Area of the habitat showing signs of serious grazing or disturbance less than 20m²	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)

6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)

To restore the favourable conservation condition of *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caerulae) in Unshin River SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Habitat area	Area stable or increasing, subject to natural processes	Some areas supporting *Molinia* meadows were surveyed as part of the Irish Semi-natural Grassland Survey (ISGS; O'Neill et al., 2013) and the Grassland Monitoring Survey (GMS; Martin et al., 2018) within the sub-site Cloonmacduff (grassland survey site code 1541), located just east of Collooney. Additional areas were surveyed in 2021 as part of a nationwide survey of floodplain grasslands (Martin et al., in prep.). The total area of habitat mapped in the SAC is 4.88ha. See map 3. It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes	Distribution based on Martin et al. (2018) and Martin et al. (in prep.). See map 3. Note that at Cloonmacduff (1541) some areas are intermixed with PF1 (rich fen and flush; Fossitt, 2000), while others grade into a more rank sward; the latter tends to be less species-rich, and not referrable to the Annex vegetation type. Note that further unsurveyed areas of the habitat may be present within the SAC
Vegetation composition: positive indicator species	Number at a representative number of 2m x 2m monitoring stops; within 20m surrounding area of monitoring stops	At least 7 positive indicator species present in monitoring stop or, if 5–6 present in stop, additional species within 20m of stop; this includes at least one 'high quality' positive indicator species present in the stop or within 20m of stop	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018), where lists of positive indicator species are presented (consult for details). Note that purple moor-grass (*Molinia caerulea*) is a positive indicator species and should be present in at least one monitoring stop, or within 20m of a monitoring stop, for the attribute to pass (Martin et al., 2018). Note that Martin et al. (2018) mention two additional species which may be considered, should stops fail marginally on presence of indicators. High quality positive indicator species which have been recorded at Cloonmacduff (1541) include: meadow thistle (*Cirsium dissectum*), marsh hawk's-beard (*Crepis paludosa*) and western marsh-orchid (*Dactylorhiza majalis*). While the cover of positive indicators has been noted to be generally good in parts of Cloonmacduff, some areas are rank and dominated by soft rush (*Juncus effusus*) due to uneven grazing pressure (Martin et al., 2018)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018), where the list of negative indicator species is presented
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species not more than 1%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Vegetation composition: moss species	Percentage cover at a representative number of 2m x 2m monitoring stops	Hair mosses (*Polytrichum* spp.) not more than 25% cover	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Vegetation composition: woody species and bracken	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of woody species and bracken (*Pteridium aquilinum*) not more than 5% cover	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)

Vegetation structure: broadleaf herb:grass ratio	Percentage at a representative number of 2m x 2m monitoring stops	Broadleaf herb component of vegetation between 40% and 90%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018). Broadleaf herb component of vegetation between 30% and 40% may be allowed to pass on expert judgement (Martin et al., 2018). Herb cover and diversity has been noted to be generally high at the Cloonmacduff site (1541), but some areas are rank and dominated by soft rush (*Juncus effusus*) due to uneven grazing pressure across the site (Martin et al., 2018)
Vegetation structure: sward height	Percentage at a representative number of 2m x 2m monitoring stops	At least 30% of sward between 10cm and 80cm tall	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Vegetation structure: litter	Percentage cover at a representative number of 2m x 2m monitoring stops	Litter cover not more than 25%	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Physical structure: bare ground	Percentage cover at a representative number of 2m x 2m monitoring stops	Not more than 10% bare ground	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)
Physical structure: grazing or disturbance	Area in local vicinity of a representative number of monitoring stops	Area of the habitat showing signs of serious grazing or disturbance less than 20m²	Attribute and target based on O'Neill et al. (2013) and Martin et al. (2018)

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 Unshin River 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	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* is present within Unshin River SAC. The surveyed habitat comprises numerous small stands, many of which are less than 1ha in area. As part of the National Survey of Native Woodlands (NSNW), the sub-sites Woodview Gate (Markree) (NSNW site code 523), Toberscanavan III (Markree) (528), Bridge (Coopershill) (530), Ardneeskan (Coopershill) (531), Isolated Woodland (Coopershill) (532), Coolbock Bridge (533), Fidwog (534), Knocknacross (535) and Closkeybridge (537) were surveyed by Perrin et al. (2008). Sub-site Fidwog (code 534) was also included in national monitoring surveys (O'Neill and Barron, 2013; Daly et al., in prep.). Map 4 shows the minimum area of alluvial forests within the SAC, which is estimated to be 8.87ha (Perrin et al., 2008; Daly et al., in prep.). It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The surveyed woodland areas are shown on map 4	Distribution based on Perrin et al. (2008) and Daly et al. (in prep.). It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	The target aims for a diverse structure with a canopy containing mature trees, shrub layer with semi-mature trees and shrubs, and well-developed field layer (herbs, graminoids and dwarf shrubs) and ground layer (bryophytes). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013). Perrin et al. (2008) found the shrub layer and/or field layer to be poorly developed within a number of the alluvial forest sites surveyed within the SAC
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/ivc-classification-explorer)
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91E0* are alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and willows (*Salix* spp.). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
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 and lake floodplains, but not for woodland around springs/seepage areas

Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem. Dead wood comprises old senescent trees, standing dead trees, fallen dead wood (including large branches) and rotten stumps of any tree species. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: veteran trees	Number per hectare	No decline	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; population size	No decline in distribution and, in the case of red listed and other rare or localised species, population size	Includes ancient or long-established woodlands (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species. Parts of the alluvial forest habitat at Fidwog (NSNW site code 534) have been categorised as Long-established Woodland (I) i.e. they appear on the 1830s 1st edition Ordnance Survey maps but no further evidence of antiquity could be found in older documentation (Perrin and Daly, 2010). The tree lungwort lichen (*Lobaria pulmonaria*) was recorded at Woodview Gate (Markree) (site code 523) (Perrin et al., 2008). See also the conservation objective for otter (*Lutra lutra*; Annex II species code 1355) in this volume
Woodland structure: indicators of overgrazing	Occurrence	All five indicators of overgrazing absent	There are five indicators of overgrazing within 91E0*: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, severe recent bark stripping, and trampling (Daly et al., in prep.). Perrin et al. (2008) noted that parts of Fidwog (NSNW site code 534) were grazed by cattle, and Closkeybridge (537) was grazed by sheep from adjacent pastures
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91E0* are alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and willows (*Salix* spp.) (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91E0* are alder (*Alnus glutinosa*), ash (*Fraxinus excelsior*) and willows (*Salix* spp.). Positive indicator species for 91E0* are listed in Daly et al. (in prep.) and O'Neill and Barron (2013)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species) should be absent or under control. Invasive non-native species are a significant pressure affecting the alluvial forests habitat within Unshin River SAC. The non-native trees beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*) and horse-chestnut (*Aesculus hippocastanum*) are present within the alluvial forests habitat (Perrin et al., 2008). Invasive non-native trees were problematic at the monitoring site at Fidwog (NSNW site code 534) (Daly et al., in prep.). Perrin et al. (2008) recorded dense areas of Rhododendron (*Rhododendron ponticum*) at Woodview Gate (Markree) (site code 523) and Toberscanavan III (Markree) (528). Close to the river bank at Ardneeskan (Coopershill) (531), the shrub layer was dominated by Japanese knotweed (*Reynoutria japonica*) and cherry laurel (*Prunus laurocerasus*)
Vegetation composition: problematic native species	Percentage	Cover of common nettle (*Urtica dioica*) less than 75%	Common nettle (*Urtica dioica*) is a positive indicator species for 91E0* but, in some cases, it may become excessively dominant. Increased light and nutrient enrichment are factors which favour proliferation of common nettle (Daly et al., in prep.). Perrin et al. (2008) noted that *U. dioica* was abundant in wetter areas at Closkeybridge (NSNW site code 537)

1106 Salmon *Salmo salar*

To maintain the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in Unshin River SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) 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 Technical Expert Group on Salmon's (TEGOS) annual model output of CL attainment levels. See Gargan et al. (2021) for further details. Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The Unshin River is part of the Ballysadare catchment and is currently above its CL for salmon
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 minutes 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 (*Lepeophtheirus salmonis*)
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
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)

1355 Otter *Lutra lutra*

To maintain the favourable conservation condition of Otter (*Lutra lutra*) in Unshin River 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. Favourable Conservation Status (FCS) target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 124.68ha	No field survey. Areas mapped to include 10m terrestrial buffer along river banks and around water bodies identified as critical for otters (NPWS, 2007)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 66.55km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk and Moorhouse, 1991: Kruuk, 2006)
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; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m. e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed

Legend

Unshin River SAC 001898

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 1:
UNSHIN RIVER SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

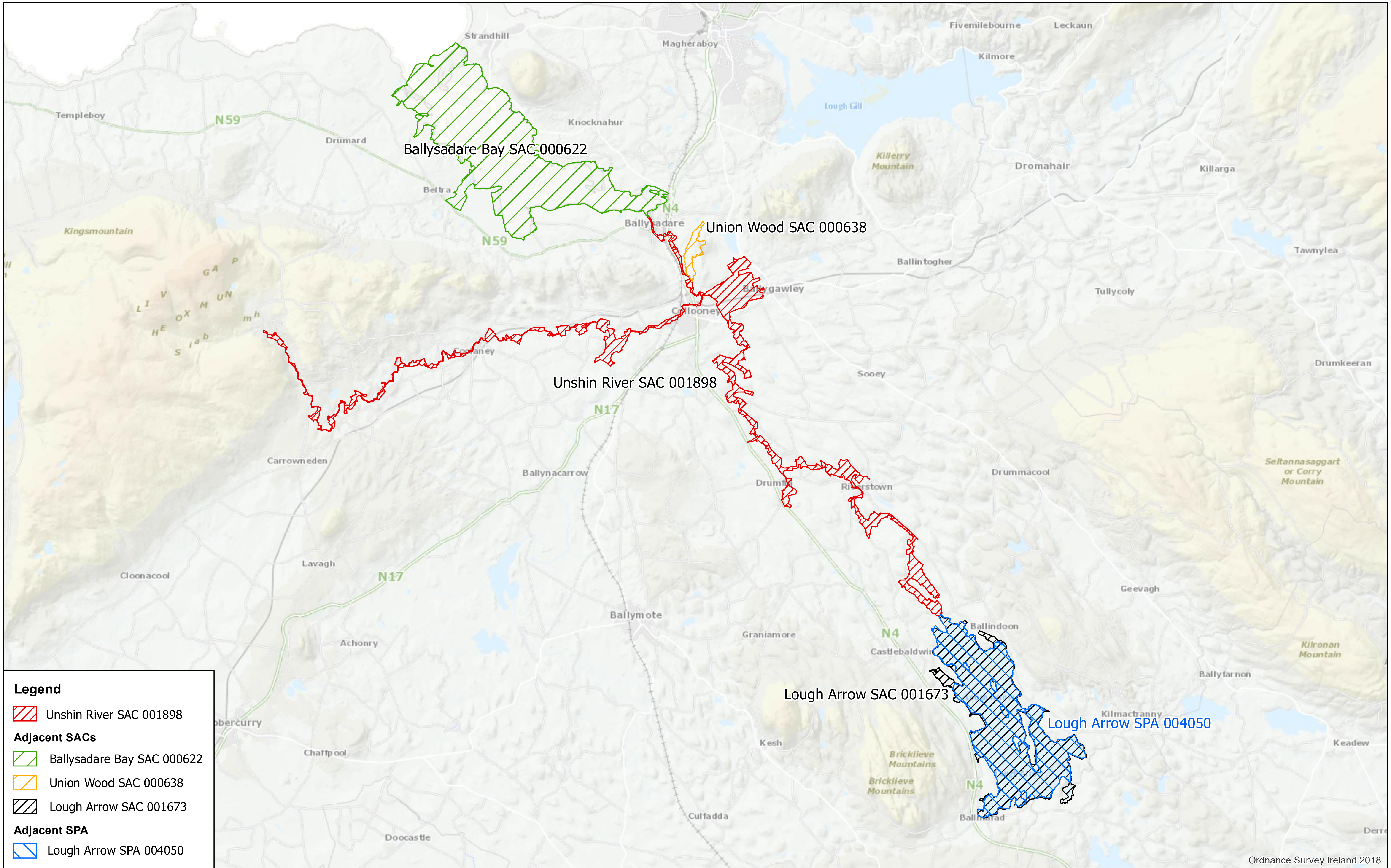
Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 001898; version 3.02.
CO. SLIGO

0 0.5 1 2 Kilometres

N

Date: November 2021



Ballysadare Bay SAC 000622
Union Wood SAC 000638
Unshin River SAC 001898
Lough Arrow SAC 001673
Lough Arrow SPA 004050
Strandhill
Magheraboy
Fivemilebourne
Leckaun
Kilmore
Lough Gill
Templeboy
N59
Knocknahur
Drumard
Killerry Mountain
Dromahair
Killarga
Beltra
N4
Ballysadare
Kingsmountain
Ballintogher
Tawnylea
Ballygawley
Tullycoly
Collooney
Coolaney
Sooey
Drumkeeran
N17
Carrowneden
Ballynacarrow
Drummacool
Seltannasaggart or Corry Mountain
Riverstown
Lavagh
Cloonacool
Geevagh
Ballymote
Graniamore
Ballindoon
Achonry
Castlebaldwin
Kilronan Mountain
Ballyfarnon
Kilmactranny
Kesh
Keadew
Chaffpool
Bricklieve Mountains
Culfadda
Doocastle
Ordnance Survey Ireland 2018
Legend
Unshin River SAC 001898
Adjacent SACs
Ballysadare Bay SAC 000622
Union Wood SAC 000638
Lough Arrow SAC 001673
Adjacent SPA
Lough Arrow SPA 004050

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 2:
UNSHIN RIVER SAC
CONSERVATION OBJECTIVES
ADJACENT / OVERLAPPING SITES

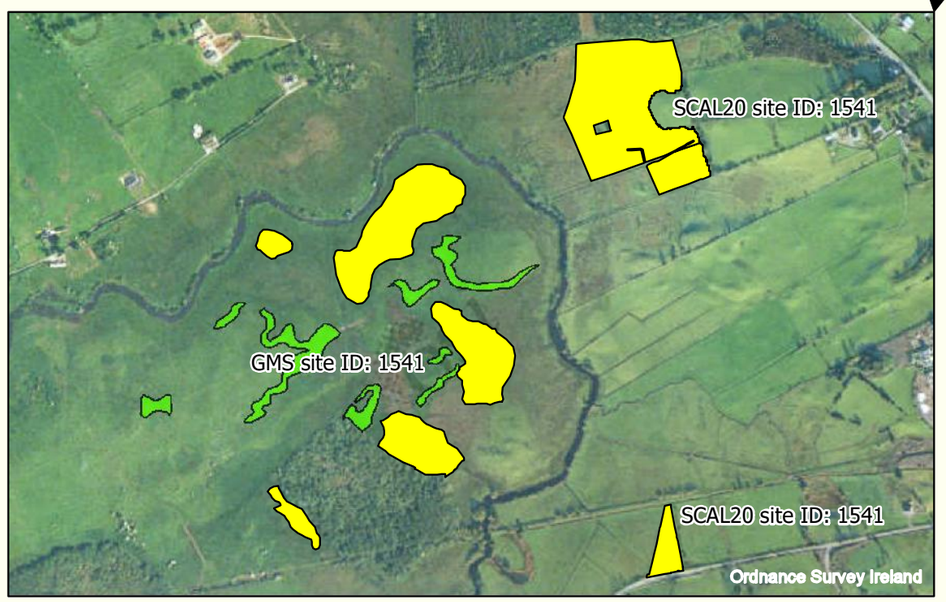
Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 001898; version 3.02.
CO. SLIGO

0 1 2 4 Kilometres

N

Date: November 2021



Legend

- 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates(*Festuco-Brometalia*) (* important orchid sites)
- 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- Unshin River SAC 001898
- OSI Discovery Series County Boundary

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 3:
UNSHIN RIVER SAC
CONSERVATION OBJECTIVES
GRASSLAND HABITATS

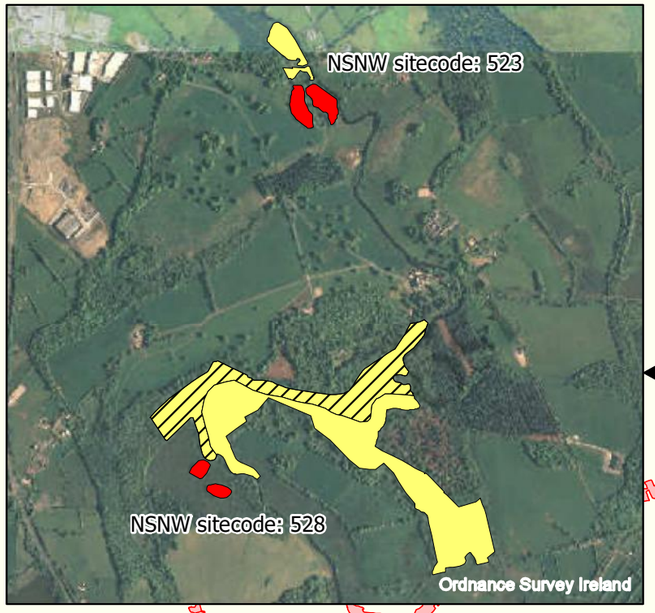
Map to be read in conjunction with the NPWS Conservation Objectives Document

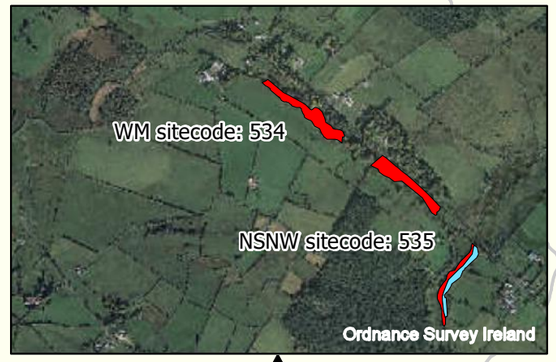
SITE CODE:
SAC 001898; version 3.02.
CO. SLIGO

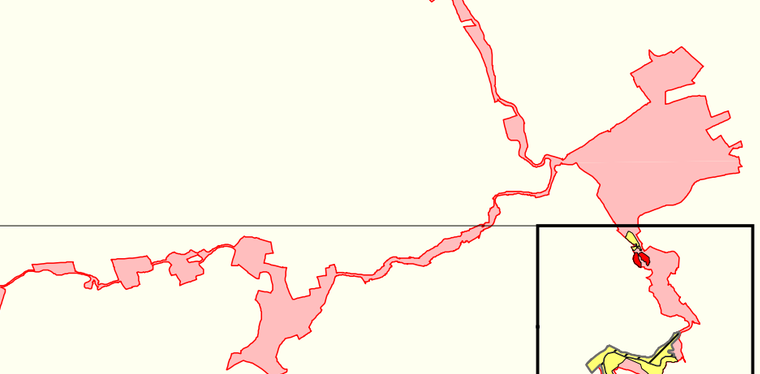
0 0.5 1 2 Kilometres

N

Date: November 2021







Legend

Annex woodland habitat

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

Non-Annex woodland habitats

- WD1 (Mixed) broadleaved woodland
- WD1 / WN6 (Mixed) broadleaved woodland / Wet willow-alder-ash woodland
- WN2 Oak-ash-hazel woodland

- Unshin River SAC 001898
- OSI Discovery Series County Boundary

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 4:
UNSHIN RIVER SAC
CONSERVATION OBJECTIVES
WOODLAND HABITATS

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

SITE CODE:
SAC 001898; version 3.02.
CO. SLIGO

0 0.5 1 2 Kilometres

N

Date: November 2021

APPENDIX 3

CONSERVATION OBJECTIVES FOR UNION WOOD SAC

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Union Wood SAC 000638

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

National Parks and Wildlife Service,
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E-mail: nature.conservation@chg.gov.ie

Citation:

NPWS (2021) Conservation Objectives: Union Wood SAC 000638. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

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***

000638	Union Wood SAC
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Please note that this SAC is adjacent to Unshin River SAC (001898). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjacent site as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	1978
Title :	Areas of Scientific Interest in County Sligo
Author :	Curtis, T.G.F.; Goodwillie, R.N.; Young, R.
Series :	Unpublished Report
Year :	2008
Title :	National survey of native woodlands 2003-2008
Author :	Perrin, P.M.; Martin, J.; Barron, S.; O'Neill, F.H.; McNutt, K.E.; Delaney, A.
Series :	Unpublished report to NPWS
Year :	2010
Title :	A provisional inventory of ancient and long-established woodland in Ireland
Author :	Perrin, P.M.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 46
Year :	2012
Title :	The beetles of decaying wood in Ireland. A provisional annotated checklist of saproxylic Coleoptera
Author :	Alexander, K.N.A.; Anderson, R.
Series :	Irish Wildlife Manual No. 65
Year :	2013
Title :	Results of a monitoring survey of old sessile oak woods and alluvial forests
Author :	O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals, No. 71
Year :	in prep.
Title :	The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats
Author :	Daly, O.H.; O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals

Other References

Year :	1993
Title :	The status and distribution of *Xylophagus ater* Meigen (Diptera: Xylohagidae) in Ireland
Author :	Alexander, K.
Series :	Irish Naturalists' Journal 24: 316-318
Year :	2002
Title :	Reversing the habitat fragmentation of British woodlands
Author :	Peterken, G.
Series :	WWF-UK, London
Year :	2016
Title :	Irish Vegetation Classification: Technical Progress Report No. 2
Author :	Perrin, P.
Series :	Report submitted to National Biodiversity Data Centre

Spatial data sources

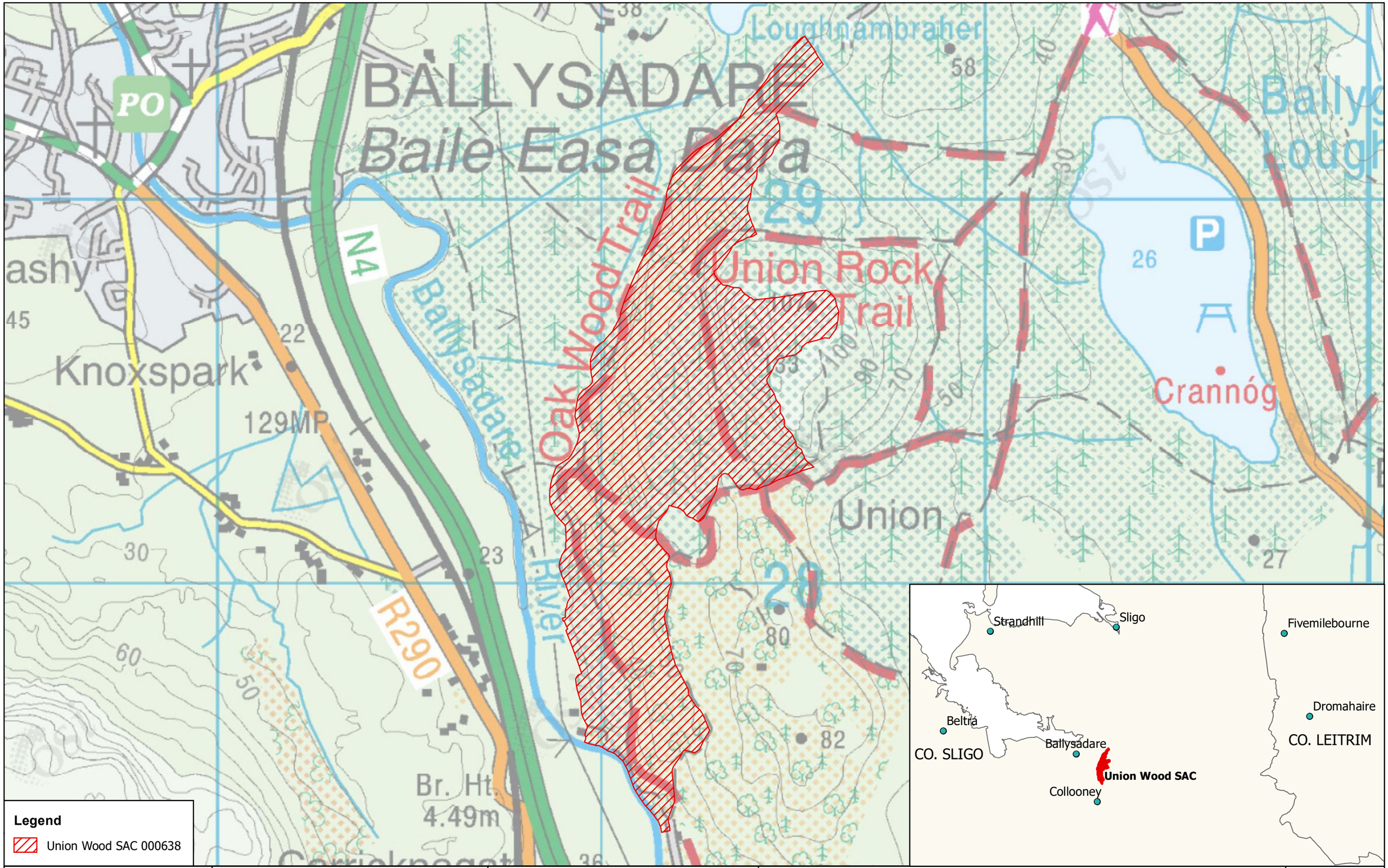
Year :	Revision 2010
Title :	National Survey of Native Woodlands 2003-2008. Version 1
GIS Operations :	QI selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91A0 (map 3)
Year :	2018
Title :	Woodland Monitoring Survey 2017-2018
GIS Operations :	QI selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91A0 (map 3)

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

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in Union Wood 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. See map 2	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles is present at Union Wood SAC. Union Wood is state-owned and protected as a Nature Reserve. As part of the National Survey of Native Woodlands (NSNW), Union Wood (NSNW site code 1401) was surveyed by Perrin et al. (2008). Union Wood (code 1401) was also included in national monitoring surveys (O'Neill and Barron, 2013; Daly et al., in prep.). The minimum area of old sessile oak woodland within the SAC is estimated to be 19.0ha (Perrin. et al, 2008). It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The mapped woodland location is shown on map 2	Distribution based on Perrin et al. (2008). It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 11m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20 cm; bryophyte cover at least 4%	The target aims for a diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer and ground layer. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/national-vegetation-database/irish-vegetation-classification)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91A0 woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea*. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013). Union Wood exhibits poor structure due to, inter alia, a lack of small and medium-sized *Quercus* trees and seedlings (Daly et al., in prep.)
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem. Dead wood comprises old senescent trees, standing dead trees, fallen dead wood (including large branches) and rotten stumps of any species. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: veteran trees	Number per hectare	No decline	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 (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species. Almost all of the old sessile oak woodland within the SAC has been identified as Possible Ancient Woodland by Perrin and Daly (2010). The site contains thin-spiked wood-sedge (*Carex strigosa*), Tunbridge filmy-fern (*Hymenophyllum tunbridgense*) and the tree lungwort lichen (*Lobaria pulmonaria*) (NPWS internal files). The rare woodland fly species *Chrysogaster virescens* and *Xylophagus ater* and the scarce old growth beetle species *Cerylon ferrugineum* have also been recorded from the area (Alexander, 1993; Alexander and Anderson, 2012; NPWS internal files)
Woodland structure: indicators of overgrazing	Occurrence	All four indicators of overgrazing absent	There are four indicators of overgrazing within 91A0: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, and severe recent bark stripping (Daly et al., 2020; O'Neill and Barron, 2013). Overgrazing by deer was noted by Curtis et al. (1978) at Union Wood. Although fencing was undertaken, and grazing was not reported as an issue in 2011-12, overgrazing was recorded within the site in 2017-18 (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea* (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91A0 woodlands present; at least 6 positive indicator species for 91A0 woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea*. Positive indicator species for 91A0 are listed in Daly et al. (in prep.) and O'Neill and Barron (2013)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species such as montbretia (*Crocosmia* x *crocosmiiflora*) should be absent or under control. The non-native invasive species beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*) and rhododendron (*Rhododendron ponticum*) are present within Union Wood (NPWS internal files). Rhododendron control has previously been undertaken (Perrin et al., 2008) but continued control of non-native species is required (Daly et al., in prep.)



An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 1:
UNION WOOD SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

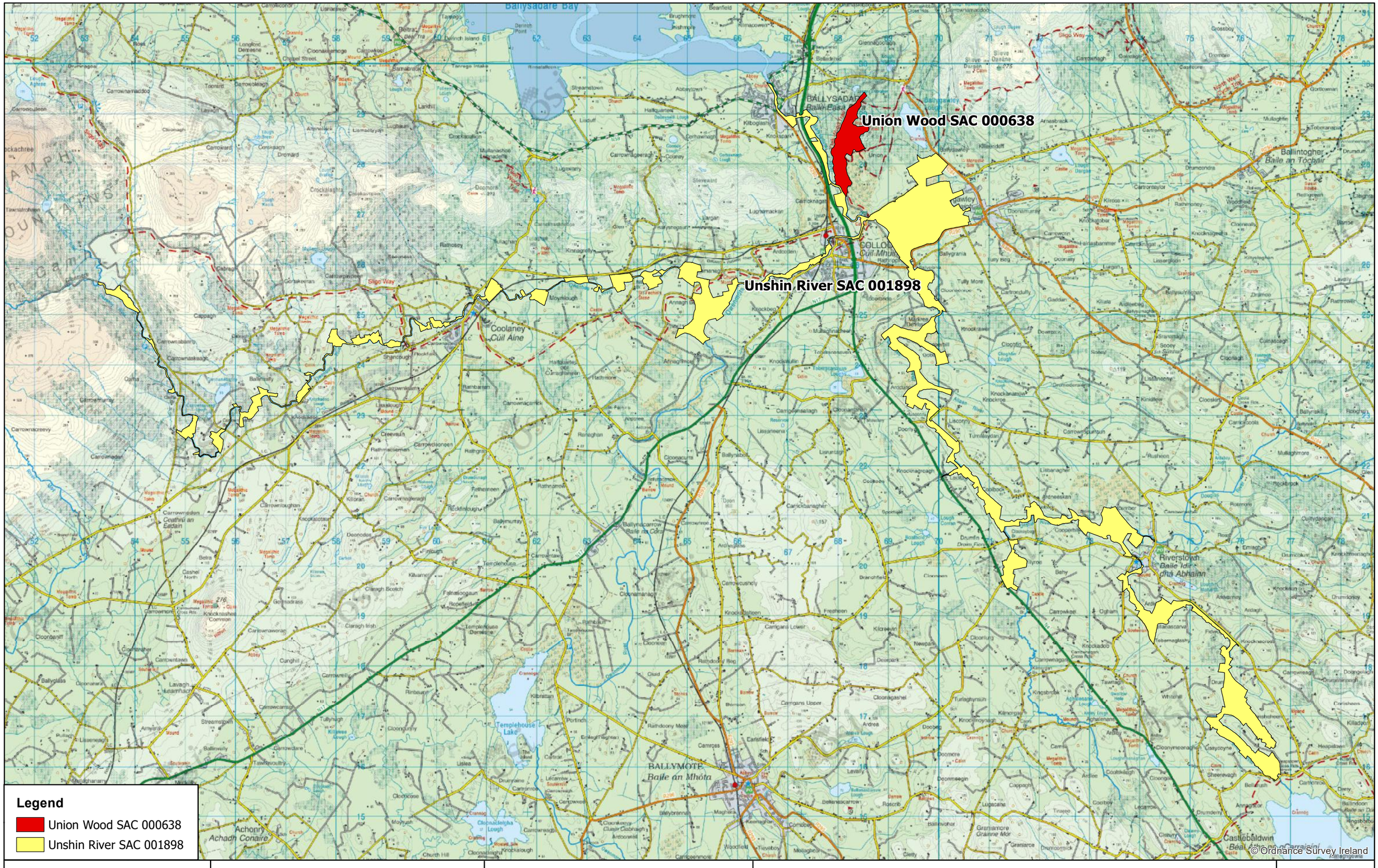
Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000638; version 3.01. CO. SLIGO

0 125 250 500 Metres

N

Date: October 2020



An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 2:
UNION WOOD SAC
CONSERVATION OBJECTIVES
ADJACENT SITE

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

SITE CODE:
SAC 000638; version 3.01. CO. SLIGO

0 0.5 1 2 Kilometres

N

Date: October 2020

Legend

Union Wood SAC 000638

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

Ordnance Survey Ireland

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 3:
UNION WOOD SAC
CONSERVATION OBJECTIVES
WOODLAND HABITATS

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

SITE CODE:
SAC 000638; version 3.01. CO. SLIGO

0 125 250 500 Metres

N

Date: October 2020

APPENDIX 4

CONSERVATION OBJECTIVES FOR BALLYSADARE BAY SAC

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Ballysadare Bay SAC 000622

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

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (2013) Conservation Objectives: Ballysadare Bay SAC 000622. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

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***

000622	Ballysadare Bay SAC
1014	Narrow-mouthed whorl snail *Vertigo angustior*
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1365	Harbour seal *Phoca vitulina*
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)*
2190	Humid dune slacks

Please note that this SAC overlaps with Ballysadare Bay SPA (004129) and adjoins Unshin River SAC (001898). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

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

NPWS Documents

Year :	1990
Title :	1989 survey of breeding herds of common seal (*Phoca vitulina*) with reference to previous surveys
Author :	Harrington, R.
Series :	Unpublished report to Wildlife Service
Year :	2004
Title :	Harbour seal population assessment in the Republic of Ireland: August 2003
Author :	Cronin, M.; Duck, C.; O'Cadhla, O.; Nairn, R.; Strong, D.; O'Keeffe, C.
Series :	Irish Wildlife Manual No. 11
Year :	2004
Title :	Summary of National Parks & Wildlife Service surveys for common (harbour) seals (*Phoca vitulina*) and grey seals (*Halichoerus grypus*), 1978 to 2003
Author :	Lyons, D.O.
Series :	Irish Wildlife Manual No. 13
Year :	2007
Title :	A Survey of Intertidal Mudflats and Sandflats in Ireland
Author :	Aquatic Services Unit
Series :	Unpublished report to NPWS
Year :	2010
Title :	Harbour seal population monitoring 2009-2012: Report no. 1. Report on a pilot monitoring study carried out in southern and western Ireland, 2009
Author :	NPWS
Series :	Unpublished Report to NPWS
Year :	2011
Title :	Monitoring and condition assessment of populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland
Author :	Moorkens, E.A.; Killeen, I.J.
Series :	Irish Wildlife Manual No. 55
Year :	2011
Title :	Harbour seal pilot monitoring project, 2010
Author :	NPWS
Series :	Unpublished Report to NPWS
Year :	2012
Title :	Harbour seal pilot monitoring project, 2011
Author :	NPWS
Series :	Unpublished Report to NPWS
Year :	2013
Title :	Ballysadare Bay SAC (site code 622) Conservation objectives supporting document- marine habitats and species V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2013
Title :	Monitoring survey of Annex I sand dune habitats in Ireland
Author :	Delaney, A.; Devaney, F.M.; Martin, J.M.; Barron, S.J.
Series :	Irish Wildlife Manual No. 75

Year :	2013
Title :	Ballysadare Bay SAC (site code 622) Conservation objectives supporting document- coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1980
Title :	An assessment of the status of the common seal (*Phoca vitulina vitulina*) in Ireland
Author :	Summers, C.F.; Warner, P.J.; Nairn, R.G.W.; Curry, M.G.; Flynn, J.
Series :	Biological Conservation 17: 115-123
Year :	2011
Title :	Subtidal benthic investigations Ballysadare Bay cSAC (site code IE000622) Co. Sligo
Author :	Aquafact
Series :	Unpublished report to the Marine Institute and NPWS
Year :	2011
Title :	A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of Ballysadare Bay
Author :	Aquatic Services Unit
Series :	Unpublished report to the Marine Institute and NPWS

Spatial data sources

Year :	2010
Title :	EPA WFD transitional waterbody data
GIS Operations :	Clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1130 (map 3)
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; EU Annex I Saltmarsh and Coastal data erased out if present
Used For :	Marine community types base data (map 4)
Year :	Interpolated 2013
Title :	2007, 2010 intertidal surveys; 2010 subtidal survey
GIS Operations :	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used For :	1140, Marine community types (maps 4 and 5)
Year :	2013
Title :	Sand Dune Monitoring Project 2011. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with saltmarsh data investigated and resolved with expert opinion as necessary
Used For :	2110, 2120, 2130, 2190 (map 6)
Year :	2013
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1014, 1365 (maps 7 and 8)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	High Water Mark (HWM) polyline feature class converted into polygon feature class; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1365 (map 8)

Conservation Objectives for : Ballysadare Bay SAC [000622]

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in Ballysadare Bay 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 as 1703ha using OSi data and the defined Transitional Water Body area under the Water Framework Directive
Community extent	Hectares	Maintain the extent of the *Zostera*-dominated community, subject to natural processes. See map 5	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011). See marine supporting document for further information
Community structure: *Zostera* density	Shoots/m²	Conserve the high quality of the *Zostera*-dominated community, subject to natural processes	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011). See marine supporting document for further details
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand with *Angulus tenuis* community complex; Muddy sand to sand with *Hediste diversicolor*, *Corophium volutator* and *Peringia ulvae* community complex; Fine sand with polychaetes community complex; Sand with bivalves, nematodes and crustaceans community complex; Intertidal reef community complex; Subtidal reef community complex. See map 5	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011) and a subtidal survey in 2010 (Aquafact, 2011). See marine habitats supporting document for further information

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Ballysadare Bay 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 4	Habitat area was estimated using OSi data as 1345ha
Community extent	Hectares	Maintain the extent of the *Zostera*-dominated community, subject to natural processes. See map 5	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011). See marine supporting document for further information
Community structure: *Zostera* density	Shoots/m²	Conserve the high quality of the *Zostera*-dominated community, subject to natural processes	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011). See marine supporting document for further information
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand with *Angulus tenuis* community complex; Muddy sand to sand with *Hediste diversicolor*, *Corophium volutator* and *Peringia ulvae* community complex. See map 5	Based on intertidal surveys undertaken in 2007 and 2010 (ASU, 2007, 2011). See marine supporting document for further information

2110 Embryonic shifting dunes

To maintain the favourable conservation condition of Embryonic shifting dunes in Ballysadare Bay 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-site mapped: Strandhill - 1.08ha. See map 6	Based on data from the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Embryo dunes were surveyed and mapped at one sub-site, giving a total estimated area of 1.08ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from Delaney et al. (2013). Embryo dunes are concentrated around the growing tip of Strandhill dunes. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Coastal protection works in the form of rock armour have been installed on the seaward edge of the carpark and golf course. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Delaney et al. (2013). Transitional communities occur between a range of sand dune habitats and some saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation composition: plant health of foredune grasses	Percentage cover	More than 95% of sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities with typical species: sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*)	Based on data from Delaney et al. (2013). Embryo dunes at Strandhill support a typical flora. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover	Based on data from Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details

2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)

To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') in Ballysadare Bay 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-site mapped: Strandhill-5.47ha. See map 6	Based on data from the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Marram dunes were surveyed and mapped at one sub-site, giving a total estimated area of 5.47ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from Delaney et al. (2013). Mobile dunes occur the seaward side of the spit in the southern part of Strandhill and are particularly well developed at the growing tip. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Marram grass (*Ammophila arenaria*) reproduces vegetatively and requires constant accretion of fresh sand to maintain active growth encouraging further accretion. There are coastal protection works in place at Strandhill. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008) and Delaney et al. (2013). Transitional communities occur between a range of sand dune habitats and some saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation composition: plant health of dune grasses	Percentage cover	95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Delaney et al. (2013). The mobile dune habitat at the tip of the spit is in good condition and is actively accreting. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*)	Based on data from Delaney et al. (2013). The mobile dunes at Strandhill support a characteristic dune flora. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details

2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)

To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes') in Ballysadare Bay 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-site mapped: Strandhill - 56.07ha. See map 6	Based on data from the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Fixed dunes were surveyed and mapped at one sub-site, giving a total estimated area of 56.07ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from Delaney et al. (2013). Fixed dune habitat covers an extensive area at Strandhill. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. There are coastal protection works at Strandhill. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Delaney et al. (2013). Transitional communities occur between a range of sand dune habitats and some saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008) and Delaney et al. (2013). There is a large blowout in Strandhill dunes known locally as Shelly Valley, which covers 5.4ha. Trampling has created tracks in the vicinity of this blowout. See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008) and Delaney et al. (2013). The fixed dunes at Strandhill are subject to low level grazing by rabbits (*Oryctolagus cuniculus*). Grazing by cattle or sheep is absent. This has led to the reduction in species richness of the site as well as a potential problem of the spread of sycamore (*Acer pseudoplatanus*) and wild clematis (*Clematis vitalba*). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species (including *Hippophae rhamnoides*)	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. At Strandhill, negative indicator species common ragwort (*Senecio jacobaea*) and creeping thistle (*Cirsium arvense*) occur occasionally. Sycamore (*Acer pseudoplatanus*) and wild clematis (*Clematis vitalba*) have also been noted from the fixed dunes. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Delaney et al. (2013). Creeping willow (*Salix repens*) is abundant within the fixed dunes at Strandhill. Sycamore (*Acer pseudoplatanus*) has also been noted. See coastal habitats supporting document for further details

2190 Humid dune slacks

To restore the favourable conservation condition of Humid dune slacks in Ballysadare Bay 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-site mapped: Strandhill - 1.83ha. See map 6	Based on data from the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Dune slacks were surveyed and mapped at one sub-site, giving a total estimated area of 1.83ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from Delaney et al. (2013). One large slack and one small slack have been recorded from the southern part of Strandhill dunes. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation, resulting in increased rates of erosion. There are coastal protection works at Strandhill. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations (metres)	Maintain natural hydrological regime	Based on data from Gaynor (2008) and Delaney et al. (2013). The slacks are showing some signs of drying out, which may be accelerated by human interference with the local hydrology. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008) and Delaney et al. (2013). Transitional communities occur between a range of sand dune habitats and some saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground	Based on data from Gaynor (2008) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008) and Delaney et al. (2013). The dunes at Strandhill are subject to low level grazing by rabbits (*Oryctolagus cuniculus*). Grazing by cattle or sheep is absent. This has led to the reduction in species richness of the site as well as a potential problem of the spread of sycamore (*Acer pseudoplatanus*) and wild clematis (*Clematis vitalba*). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Gaynor (2008) and Delaney et al. (2013). At Strandhill, typical pioneer bryophyte species are frequent, and the locally important marsh helleborine (*Epipactis palustris*) also occurs. See coastal habitats supporting document for further details
Vegetation composition: cover of *Salix repens*	Percentage cover; centimetres	Maintain less than 40% cover of creeping willow (*Salix repens*)	Based on data from Delaney et al. (2013). Cover of Creeping willow (*Salix repens*) needs to be controlled (e.g. through an appropriate grazing regime) to prevent the development of a coarse, rank vegetation cover. It is abundant within the fixed dunes at Strandhill but is notably absent from the dune slacks. See coastal habitats supporting document for further details

Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Delaney et al. (2013).. See coastal habitats supporting document for further details

1014 Marsh Snail *Vertigo angustior*

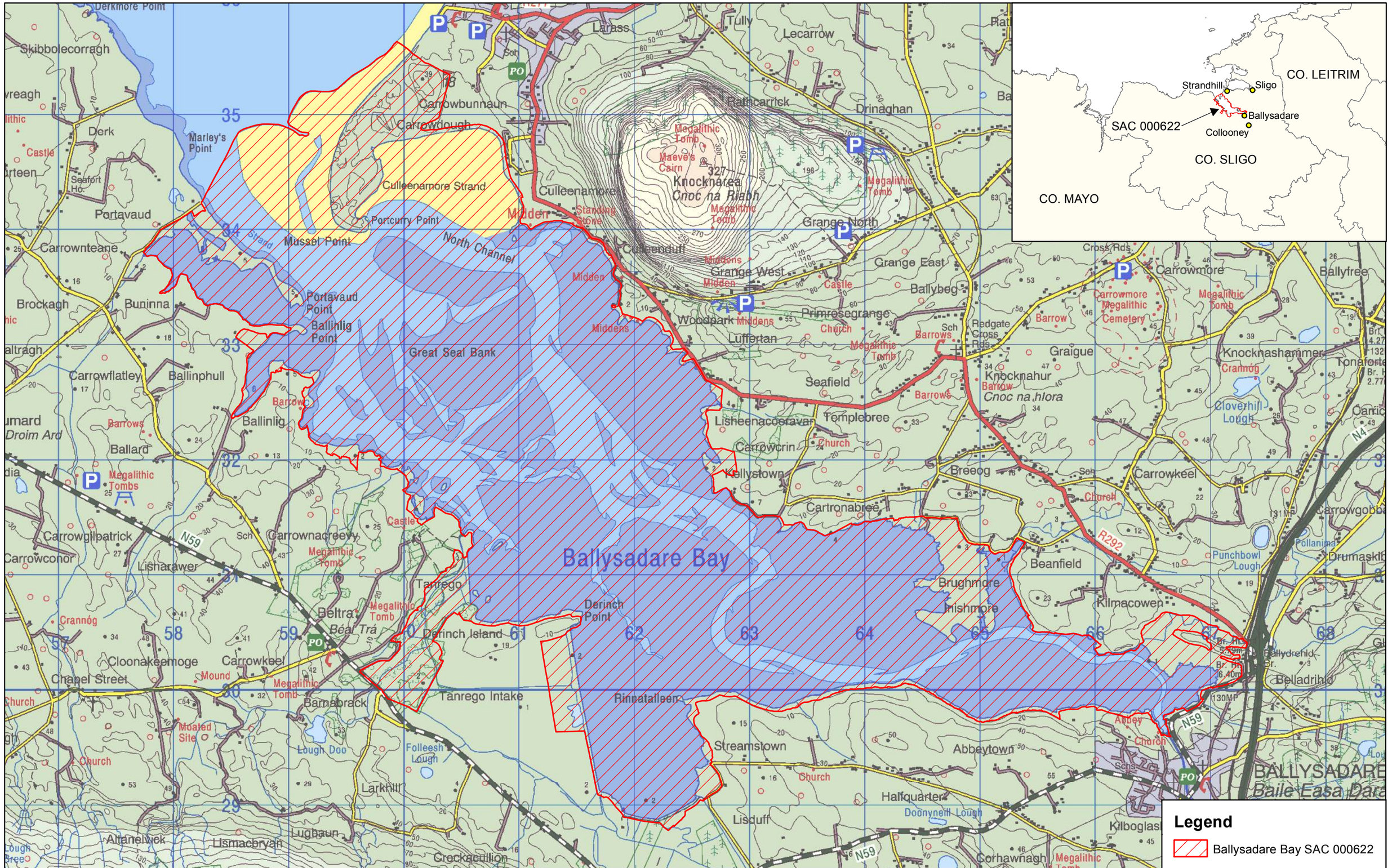
To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Ballysadare Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: occupied sites	Number	No decline. There is one known location for this species in this SAC (which overlaps two 1km squares). See map 7	From Moorkens and Killeen (2011) (site code Va CAM20)
Presence on transect	Occurrence	Adult or sub-adult snails are present in all three of the habitat zones on the transect (minimum four samples)	Transect established as part of condition assessment monitoring at this site (Moorkens and Killeen, 2011). See habitat area target below for definition of optimal and suboptimal habitat
Presence	Occurrence	Adult or sub-adult snails are present in at least six other places at the site with a wide geographical spread (minimum of eight sites sampled)	From Moorkens and Killeen (2011)
Transect habitat quality	Metres	At least 50m of habitat along the transect is classed as optimal and the remainder as at least sub-optimal	From Moorkens and Killeen (2011). See habitat extent target below for definition of optimal and sub-optimal habitat. See habitat area target below for definition of optimal and suboptimal habitat
Transect optimal wetness	Metres	Soils, at time of sampling, are damp (optimal wetness) and covered with a layer of humid thatch for at least 50m along the transect	From Moorkens and Killeen (2011)
Habitat extent	Hectares	At least 45ha of the site in at least optimal/sub-optimal condition. Optimal habitat is defined as fixed dune, species-rich grassland dominated by red fescue (*Festuca rubra*) and marram (*Ammophila arenaria*), with sparse oxeye daisy (*Leucanthemum vulgare*), dandelion (*Taraxacum* sp.), ribwort plantain (*Plantago lanceolata*) and other low growing herbs. Vegetation height 20-50cm. Habitat growing on damp, friable soil covered with a layer of humid, open structured thatch. Sub-optimal habitat is defined as above but either vegetation height is less than 10cm or above 50cm; or the soil is dry and sandy; or the thatch is wetter with a denser structure	From Moorkens and Killeen (2011). See also the conservation objective for fixed dunes (2130)

1365 Harbour seal *Phoca vitulina*

To maintain the favourable conservation condition of Harbour Seal in Ballysadare Bay SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use. See map 8	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 8	Attribute and target based on background knowledge of Irish breeding populations, review of data summarised by Summers et al. (1980); Harrington (1990); Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition. See map 8	Attribute and target based on background knowledge of Irish populations, review of data from Lyons (2004); Cronin et al. (2004); NPWS (2010); NPWS (2011); NPWS (2012) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 8	Attribute and target based on background knowledge of Irish populations, review of data from Lyons (2004) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	See marine supporting document for further details



Legend

Ballysadare Bay SAC 000622

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Department of Arts, Heritage and the Gaeltacht

MAP 1: BALLYSADARE BAY SAC CONSERVATION OBJECTIVES SAC DESIGNATION

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2013

SAC 000622

SPA 004129

SAC 001898

Legend

- Ballysadare Bay SAC 000622
- Unshin River SAC 001898
- Ballysadare Bay SPA 004129
- OSi Discovery Series County Boundary

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Department of Arts, Heritage and the Gaeltacht

MAP 2:
BALLYSADARE BAY SAC CONSERVATION OBJECTIVES ADJOINING / OVERLAPPING DESIGNATIONS

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

SITE CODE: SAC 000622; version 3,
SAC 001898; version 3.
SPA 004129; version 1.03. CO. SLIGO

0 1 2 3 4 5 km

N

Map Version 1
Date: Sept 2013

Legend

- Ballysadare Bay SAC 000622
- 1130 Estuaries
- OSi Discovery Series County Boundary

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MAP 3:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
ESTUARIES

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2013

Legend

- Ballysadare Bay SAC 000622
- 1140 Mudflats and sandflats not covered by sea water at low tide
- OSi Discovery Series County Boundary

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MAP 4:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
TIDAL MUDFLATS AND SANDFLATS

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2013

Legend

Ballysadare Bay SAC 000622

OSi Discovery Series County Boundary

Marine Community Types

Fine sand with polychaetes community complex

Intertidal reef community

Intertidal sand with *Angulus tenuis* community complex

Muddy sand to sand with *Hediste diversicolor*, *Corophium volutator* and *Peringia ulvae* community complex

Sand with bivalves, nematodes and crustaceans community complex

Subtidal reef community

Zostera-dominated community

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MAP 5:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

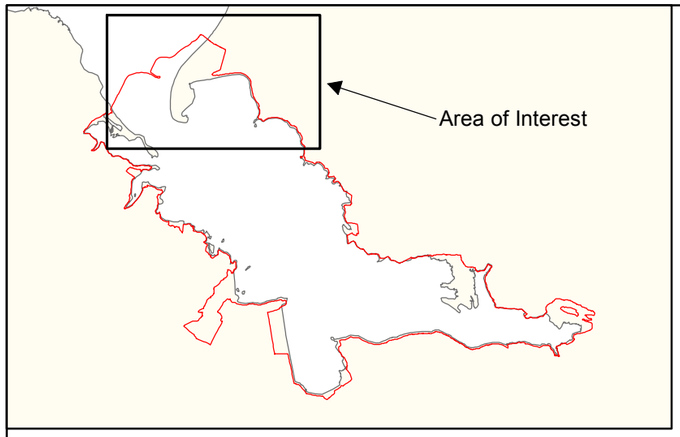
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2013



Legend

Ballysadare Bay SAC 000622

OSi Discovery Series County Boundary

SDM: 133 Sand Dune Monitoring Project Site Codes

Sand Dune Habitats

Qualifying Interests

2110 Embryonic shifting dunes

2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')

2190 Humid dune slacks

Non-Qualifying Interests

1220 Perennial vegetation of stony banks

2170 Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)

SDM: 133

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MAP 6:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
SAND DUNE HABITATS

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

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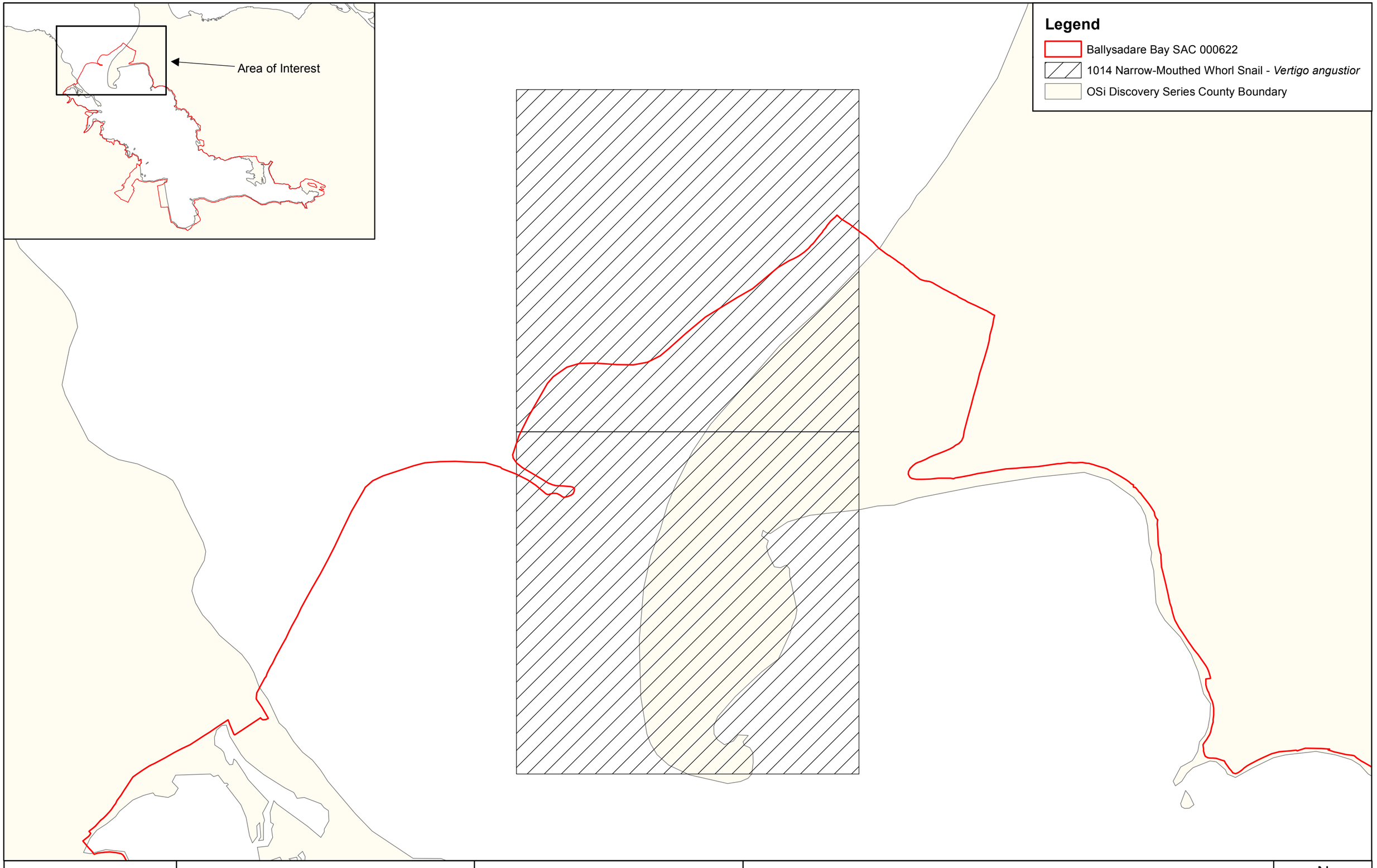
N

Map Version 1
Date: Sept 2013



Legend

- Ballysadare Bay SAC 000622
- 1014 Narrow-Mouthed Whorl Snail - *Vertigo angustior*
- OSi Discovery Series County Boundary

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MAP 7:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
NARROW-MOUTHED WHORL SNAIL

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 100 200 300 400 500 m

N

Map Version 1
Date: Sept 2013

Legend

- Ballysadare Bay SAC 000622
- 1365 Harbour Seal - *Phoca vitulina* breeding sites
- 1365 Harbour Seal - *Phoca vitulina* moulting sites
- 1365 Harbour Seal - *Phoca vitulina* resting sites
- 1365 Harbour Seal - *Phoca vitulina* habitat
- OSi Discovery Series County Boundary

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MAP 8:
BALLYSADARE BAY SAC
CONSERVATION OBJECTIVES
HARBOUR SEAL

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

SITE CODE:
SAC 000622; version 3. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Sept 2013

APPENDIX 5

CONSERVATION OBJECTIVES FOR BALLYSADARE BAY SPA

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Ballysadare Bay SPA 004129

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

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

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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***

004129	Ballysadare Bay SPA
A046	Brent Goose *Branta bernicla hrota*
A141	Grey Plover *Pluvialis squatarola*
A149	Dunlin *Calidris alpina alpina*
A157	Bar-tailed Godwit *Limosa lapponica*
A162	Redshank *Tringa totanus*
A999	Wetlands

Please note that this SPA overlaps with Ballysadare Bay SAC (000622) and is adjacent to Drumcliff Bay SPA (004013) and Cummeen Strand SPA (004035). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2013
Title :	Ballysadare Bay SPA (site code 4129) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

A046 Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Ballysadare Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

To maintain the favourable conservation condition of Grey Plover in Ballysadare Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in Ballysadare Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Ballysadare Bay SPA [004129]

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Ballysadare Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Ballysadare Bay SPA [004129]

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Ballysadare Bay SPA, which is defined by the following list of attributes and targets:

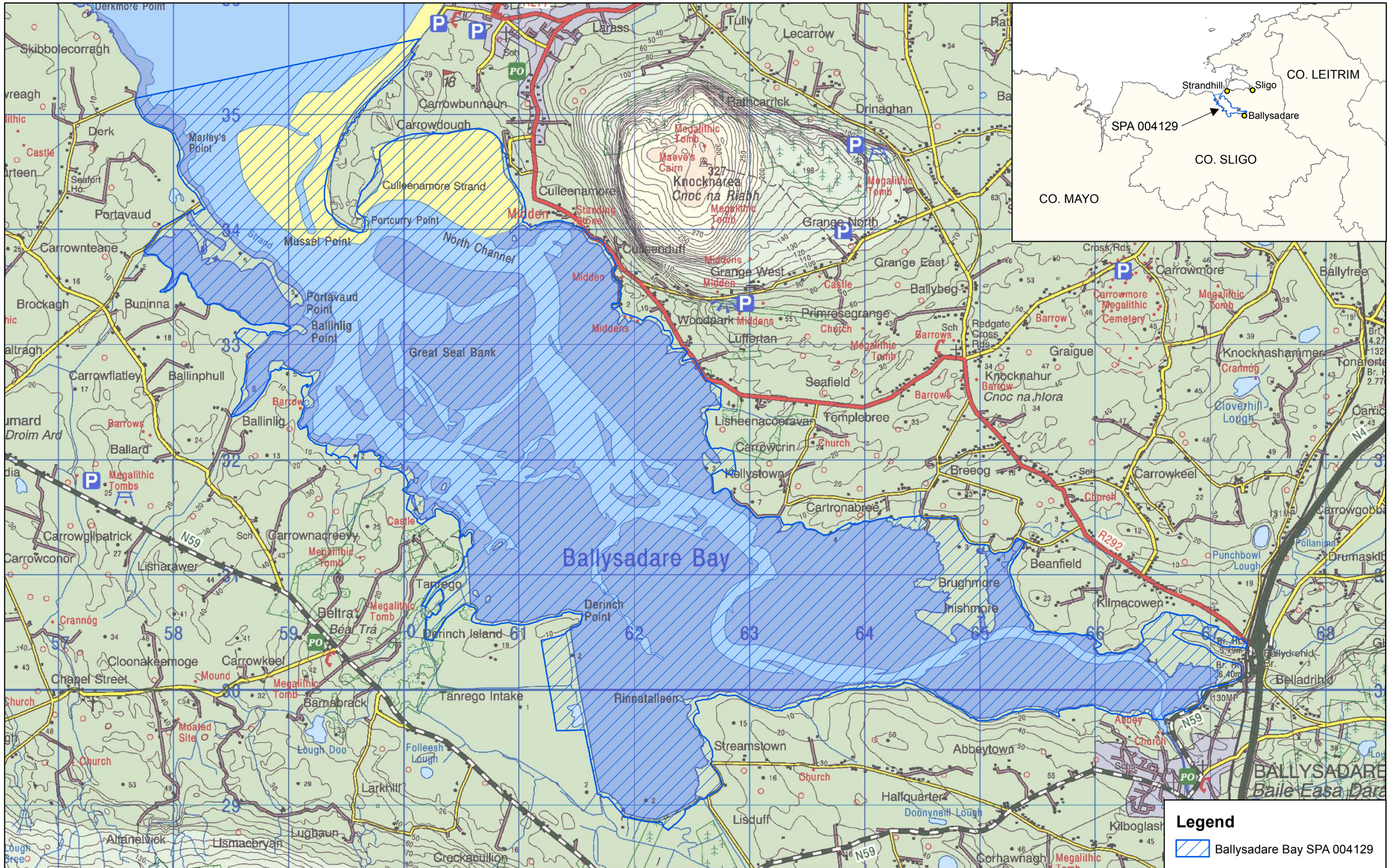
Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Ballysadare Bay SPA [004129]

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Ballysadare Bay SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2130 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 2130ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document



Legend

Ballysadare Bay SPA 004129

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MAP 1: BALLYSADARE BAY SPA CONSERVATION OBJECTIVES SPA DESIGNATION

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

SITE CODE: SPA 004129; version 1.03. CO. SLIGO

0 0.5 1 1.5 2 km

N

Map Version 1
Date: Oct 2013

004013

004035

000622

004129

Legend

- Ballysadare Bay SPA 004129
- Drumcliff Bay SPA 004013
- Cummeen Strand SPA 004035
- Ballysadare Bay SAC 000622
- OSi Discovery Series County Boundary

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

MAP 2:
BALLYSADARE BAY SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING
DESIGNATIONS

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

SITE CODE: SPA 004129; version 1.03
SPA 004013; version 2.02, SPA 004035; version 1.03,
SAC 000622; version 3. CO. SLIGO.

0 1 2 3 4 km

N

Map Version 1
Date: Oct 2013