Natura Impact Statement

Appropriate Assessment

Retail Development

Masshill Rd. & Circular Rd. (N17)

Tubbercurry, Co. Sligo

Prepared by: Moore Group – Environmental Services

12th December 2019

On behalf of Surlis's Supervalu Ltd &

Sligo County Council

Project Proponent	Surlis's Supervalu Ltd
Project	Retail Development Masshill Rd. & Circular Rd. (N17), Tubbercurry, Co. Sligo
Title	Natura Impact Statement Retail Development Masshill Rd. & Circular Rd. (N17), Tubbercurry, Co. Sligo

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Moore Archaeological and Environmental Services Limited				

Abbreviations

AA	Appropriate Assessment
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
GIS	Geographical Information System
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage System

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1. Introduction

1.1. General Introduction

This Natura Impact Statement (NIS) has been prepared by Moore Group – Environmental Services on behalf of Surlis's Supervalu Ltd and Sligo County Council. This NIS report contains information to assist the competent authority in carrying out an Appropriate Assessment (AA) on the effects of the proposed development of a Retail development at Masshill Rd. & Circular Rd. (N17), Tubbercurry, Co. Sligo on European sites, to ascertain whether or not the Project would adversely affect European site integrity.

This NIS informs the Appropriate Assessment (AA) process in the determination of the significance of potential impacts on the conservation objectives of European sites. It is necessary that the proposed development has regard to Article 6 of the Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (referred to as the Habitats Directive). This is transposed into Irish Law by Part XAB of the Planning and Development Act 2000 as amended and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477) (referred to as the Habitats Regulations). The focus of the assessment is on objectively assessing by reference to the evidence as to whether the Project will adversely affect the integrity of the European sites in light of their conservation objectives.

1.2. Legislative Background - The Habitats and Birds Directives

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) is the main legislative instrument for the protection and conservation of biodiversity in the EU. Under the Directive Member States are obliged to designate Special Areas of Conservation (SACs) which contain habitats or species considered important for protection and conservation in a European Union context.

The Birds Directive (Council Directive 79/409/EEC and Council Directive 2009/147/EC on the Conservation of Wild Birds), is concerned with the long-term protection and management of all wild bird species and their habitats in the EU. Among other things, the Directive requires that Special Protection Areas (SPAs) be established to protect migratory species and species which are rare, vulnerable, in danger of extinction, or otherwise require special attention.

Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs), designated under the Birds Directive, form a pan-European network of protected sites

known as Natura 2000. The Habitats Directive sets out a unified system for the protection and management of SACs and SPAs.

Articles 6(3) and 6(4) of the Habitats Directive set out the requirement for an assessment of proposed plans and projects likely to affect Natura 2000 sites.

Article 6(3) establishes the requirement to screen all plans and projects and to carry out a further assessment if required (Appropriate Assessment (AA)); Article 6(4) establishes requirements in cases of imperative reasons of overriding public interest:

> Article 6(3): *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to an 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): *"If, in spite of a negative assessment of the implications for the 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 the 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, to the beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."*

1.3. Methodology

The Commission's methodological guidance (EC, 2002) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1-2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

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 there are not likely to be significant effects on a Natura 2000 site. Mitigation measures (i.e., measures intended to avoid or reduce the harmful effects of the project on the site concerned) cannot be taken into account at this stage.

Stage 2 Appropriate Assessment: In this stage, there is a consideration of the impact of the project with a view to ascertain whether there will be any adverse effect on the integrity of the Natura 2000 site either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are predicted impacts, an assessment of the potential mitigation of those impacts is considered.

Stage 3 Assessment of Alternative Solutions: This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site.

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 sites will be necessary.

1.4. Guidance

The NIS has been compiled in accordance with guidance contained in the following documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 rev.).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 2002); hereafter referred to as the EC Article Guidance Document.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2000); hereafter referred to as MN2000.

- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC (EC, 2018).

1.5. Data Sources

Sources of information that were used to collect data on the Natura 2000 network of sites, and the environment within which they are located, are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Open Street Maps;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2019;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records;
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans in neighbouring areas;
    - Sligo County Development Plan 2017-2023
    - Tubbercurry LAP 2015-2021

1.6. Statement of Authority

This report was compiled by Ger O'Donohoe (B.Sc. Applied Aquatic Sciences (GMIT, 1993) & M.Sc. Environmental Sciences (TCD, 1999)) who has over 25 years' experience in environmental impact assessment and has completed numerous reports for the purposes of Appropriate Assessment Screening and Natura Impact Statements.

Engineering and technical data was supplied by JA Gorman Consulting Engineers and Brock McClure Planning and Development Consultants for the proposed development.

1.7. Description of the Project

Surlis's Supervalu Limited intends to apply for permission for development on a site of c. 1.13 ha at the junction of Masshill Road and Circular Road/N17, Carrowntubber, Tubbercurry, Co. Sligo. The proposed development shall consist of the demolition of a 2 storey retail/warehouse/storage/office building on site (c. 471 sq m GFA) and the construction of a new 1-2 storey (overall height 9.2 m) retail development of c. 2,021 sq m (Total GFA) / c. 1,974 sq m (Total NFA). The retail proposal shall consist of a convenience retail supermarket including off licence and main entrance lobby area (c. 1,311 sq m NFA); ancillary supermarket goods storage area (c. 275 sq m NFA); a café unit (c. 94 sq m NFA); and a retail unit (c. 94 sq m NFA), all at ground floor level. At first floor level ancillary office floor space (c. 200 sq m GFA) is proposed.

The proposal shall also provide for 2 no. new vehicular access points via Masshill Road; a new pedestrian connection/access ramp to an existing car park adjoining the application site to the south; new advertising structures and retail signage (c. 52.9 sq m GFA); c. 127 no. car parking spaces; 30 no. bicycle parking spaces; trolley bays; refuse and recycling storage area (c. 32 sq m GFA); plant space (c. 32 sq m GFA); service and delivery yard area, including new dock leveller (c. 85 sq m GFA); all landscaping works including boundary treatment; new service and drainage connections; public lighting; and all associated site development works.

The proposed development is to be connected to the existing public sewer network for the disposal of wastewater.

It is noted that there are two land-drains which pass through the site from north northeast to southwest, which discharge into the Maiden River' which forms the southern boundary of the site and leads on to the Tubbercurry Stream. As part of the proposed Project it is proposed to culvert this central smaller drain. The 'Maiden River' located along the western boundary of the proposed Project will be retained *in situ* and included in the landscape plan for the site.

Surface water will be attenuated and treated via interception before discharge to the adjacent Maiden River.

Figure 1 shows the proposed Project location and Figure 2 shows a detailed view of the proposed Project boundary on recent aerial photography. Figure 3 is a plan of the proposed Project.

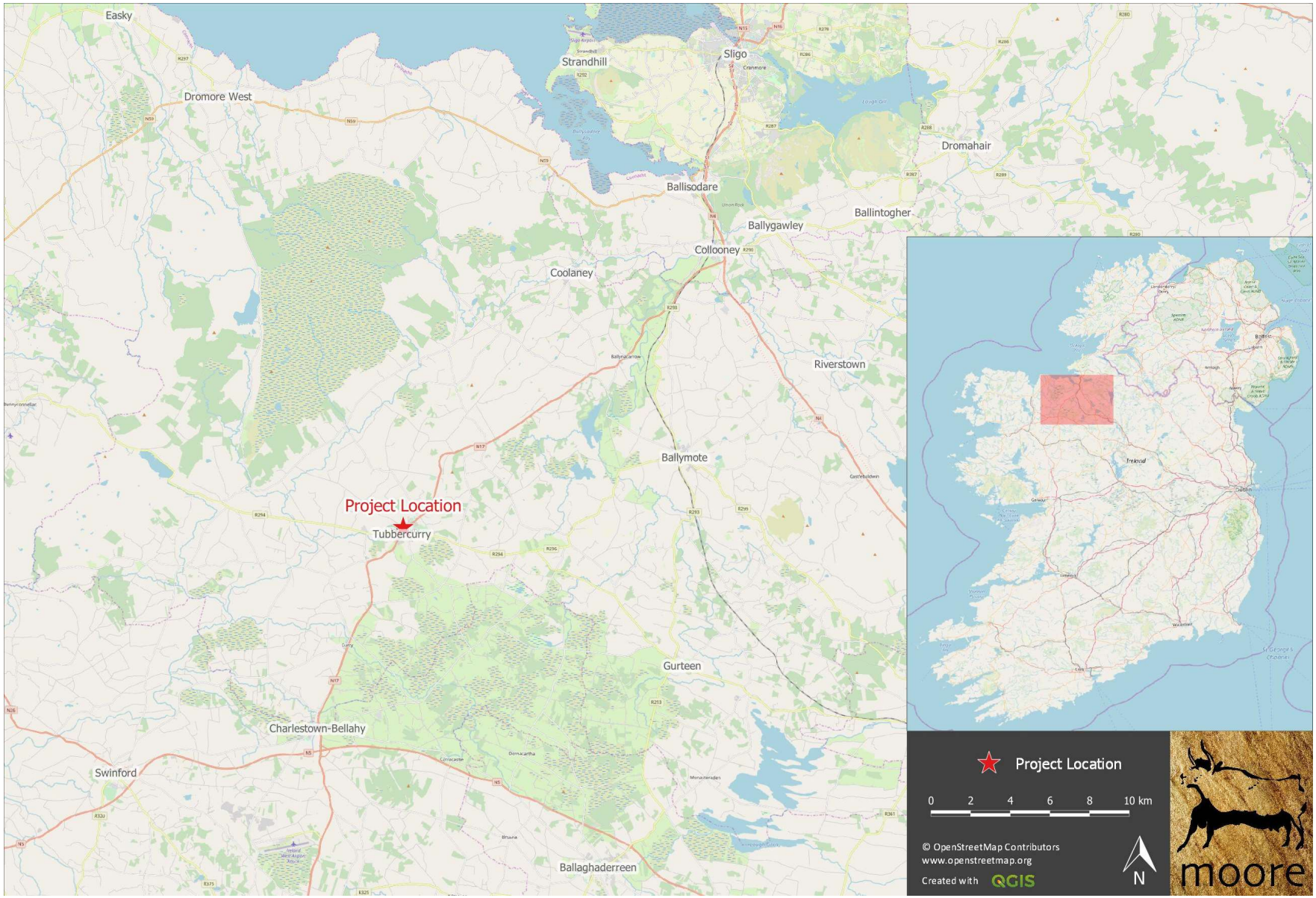

Figure 1. Showing the Project location in Tubbercurry, County Sligo.

Figure 2. Showing the proposed development boundary on recent aerial photography.

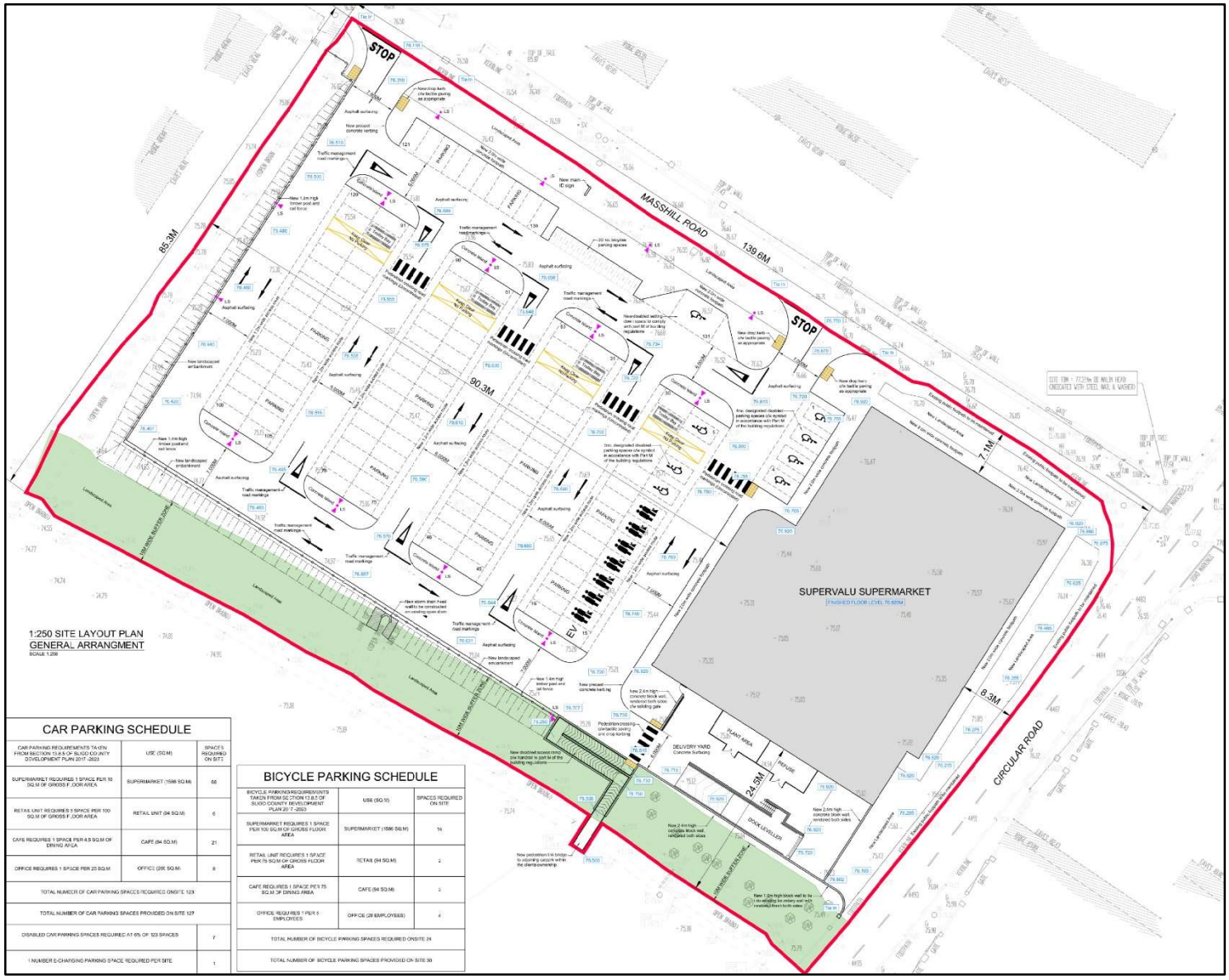

Figure 3. Proposed layout with the boundary of the development shown in red.

2. Stage 1 – Screening for Appropriate Assessment

Screening determines whether appropriate assessment is necessary by examining:

1) Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of the site, and;

2) The potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives and considering whether these effects will be significant.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process in certain circumstances, becomes overly complicated, then the process must proceed to Stage 2 (AA).

DoEHLG (2009) Guidance on Appropriate Assessment suggests an assessment of European sites within a zone of impact of 15 km. This distance is a guidance only and the zone of impact has been identified taking consideration of the nature and location of the proposed Project to ensure all European sites with connectivity to it are considered in terms of a catchment-based assessment.

The zone of impact may be determined by connectivity to the proposed Project in terms of:

- Nature, scale, timing and duration of works and possible impacts, nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Sensitivity and location of ecological features.

The guidance provides that, at the screening stage, it is necessary to identify the sites and compile information on their qualifying interests and conservation objectives. In preparation for this, the potential for source pathway receptor connectivity is firstly identified and detailed information is then provided on sites with connectivity. European sites that are located within 15 km of the Project are listed in Table 1 and presented in Figures 5 and 6 below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on the 26th of November 2019.

Table 1 European Sites located within 15km or the potential zone of impact[1] of the Project.

Site Code	Site name	Distance (km)[2]
000492	Doocastle Turlough SAC	5.78
000497	Flughany Bog SAC	9.71
000633	Lough Hoe Bog SAC	11.80
000634	Lough Nabrickkeagh Bog SAC	9.69
000636	Templehouse and Cloonacleigha Loughs SAC	6.95
000637	Turloughmore (Sligo) SAC	2.00
001669	Knockalongy and Knockachree Cliffs SAC	14.97
001898	Unshin River SAC	10.60
001899	Cloonakillina Lough SAC	8.26
002006	Ox Mountains Bogs SAC	6.90
002298	River Moy SAC	4.07
000458	Killala Bay/Moy Estuary SAC	27.59
004036	Killala Bay/Moy Estuary SPA	27.83

The proposed Project site is located immediately adjacent to the Maiden River which flows into the Tubbercurry Stream, which forms the southern boundary of the proposed Project. It has been noted that there are two drains which cross the site from northeast to southwest and discharge into the Maiden River. Approximately 6 km downstream of the proposed Project, the waters of the Tubbercurry Stream enter the River Moy SAC (Site Code 002298) and soon afterwards flow into the River Moy.

Downstream the waters of the River Moy enter Killala Bay/Moy Estuary SAC (Site Code 000458) and Killala Bay/Moy Estuary SPA (Site Code 004036), which are located over 27.5 km to the north west of the proposed Project. Given the nature and scale of the proposed development and the distance between it and Killala Bay/Moy Estuary, potential significant effects on the Killala Bay/Moy Estuary European sites are screened out of the assessment at this stage.

There is no connectivity to any of the other European sites listed in Table 1 and they are screened out of the assessment at this stage.

Given the separation distance, approximately 6 river kilometres, no direct impacts on the Moy River European site are predicted and there will be no habitat loss or fragmentation as a result of the proposed development.

[1] All European sites potentially hydrologically connected irrespective of the nature or scale of the proposed Project.
[2] Distances indicated are the closest geographical distance between the proposed Project and the European site boundary, as made available by the NPWS. Connectivity along hydrological pathways may be significantly greater.

A worst-case potential indirect effect has been considered, whereby the proposed development results in a significant detrimental change in the water quality in the Moy River, either alone or in-combination with other projects or plans, as a result of pollution via Tubbercurry Stream.

In the absence of construction management, the potential impact on downstream European sites is uncertain.

Thus, in line with Departmental Guidance and having regard to ECJ case law and the 'Precautionary Principle', a Stage 2 Appropriate Assessment of this Project is has been prepared as follows.

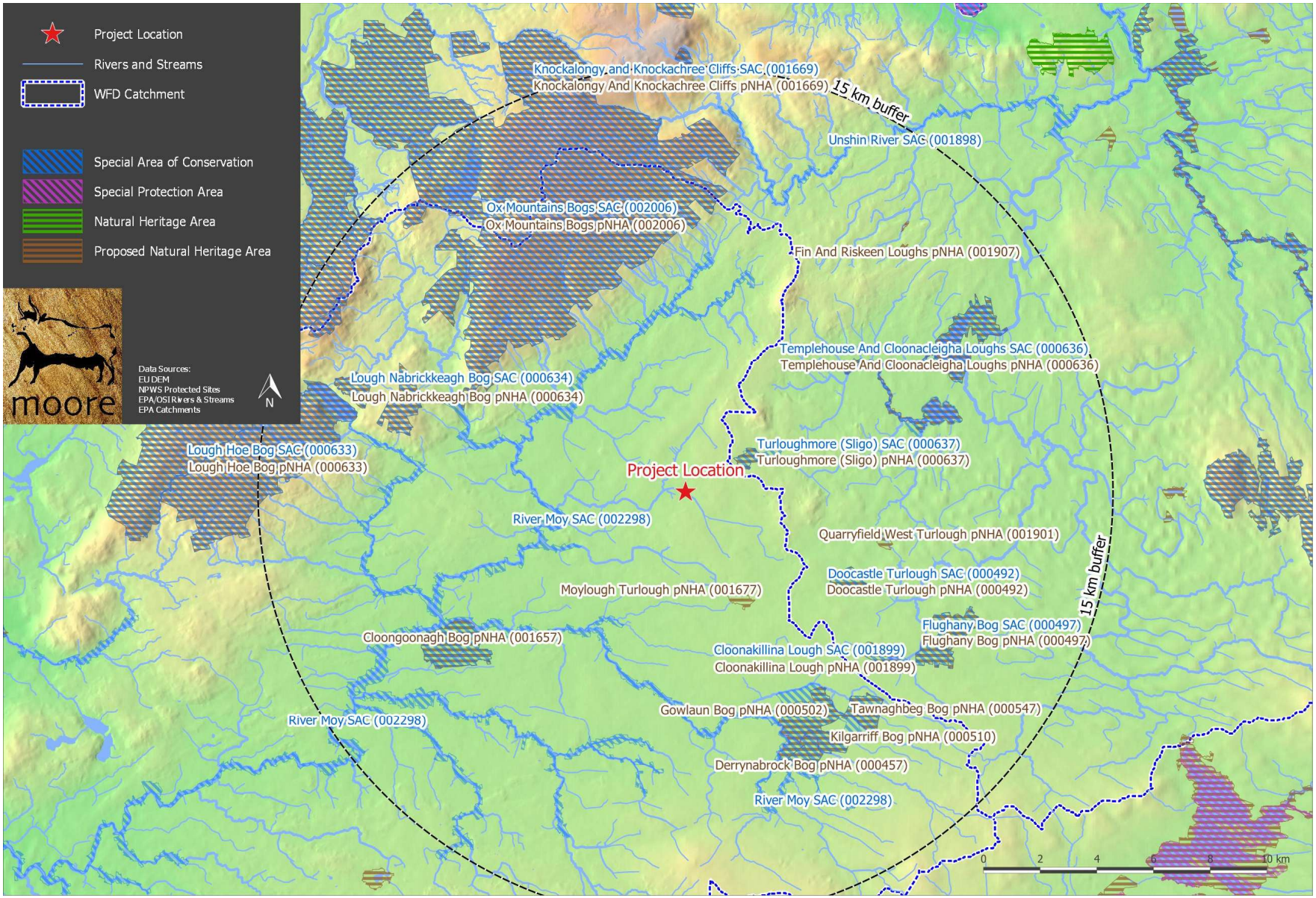

Figure 4. Showing European sites and NHAs/pNHAs within 15 km of the proposed development.

Figure 5. Detail of designated conservation sites in the vicinity of the Project showing downstream pathways to the River Moy SAC.

3. Stage 2 – Appropriate Assessment

This stage considers whether the Project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The Stage 2 Appropriate Assessment comprises a scientific examination of the plan / project and the relevant European site; to identify and characterise any possible implications for the site in view of the site's conservation objectives, structure and function; taking account of in combination effects.

3.1. Description of European Sites Potentially Affected

Potential impacts on the following European sites have been identified**:**

- Moy River SAC (Site code 002298)

The Qualifying Interests of the Moy River SAC (Site Code 002298) are set out in Table 2, below.

*Table 2 SACs located within the potential zone of influence of the Project (*indicates priority habitat).*

Site Code	Site Name	Qualifying Interests
002298	River Moy SAC	**Species:** 1092 White-clawed Crayfish *Austropotamobius pallipes* 1095 Sea Lamprey *Petromyzon marinus* 1096 Brook Lamprey *Lampetra planeri* 1106 Salmon *Salmo salar* 1355 Otter *Lutra lutra* **Habitats:** 7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion 7230 Alkaline fens 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*

This report is cognisant of the following notes outlined in the Conservation Objectives:

> **River Moy SAC** - Please note that this SAC overlaps with Killala Bay/Moy Estuary SPA (004036) and Lough Conn and Lough Cullin SPA (004228). It is adjacent to Killala Bay/Moy Estuary SAC (000458), Lough Hoe Bog SAC (000633), Bellacorick Bog Complex SAC (001922) and Ox

Mountains Bogs SAC (002006). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate.

3.1.1. Site Synopsis - River Moy SAC [002298]

The NPWS provides the following Site Synopsis in relation to the River Moy SAC (Version date 0.01.2014):

This site comprises almost the entire freshwater element of the River Moy and its tributaries including both Loughs Conn and Cullin. The system drains a catchment area of 805 sq. km. Most of the site is in Co. Mayo, though parts are in west Sligo and north Roscommon. Apart from the Moy itself, other rivers included within the site are the Deel, Bar Deela, Castlehill, Addergoole, Clydagh and Manulla on the west side, and the Glenree, Yellow, Strade, Gweestion, Trimogue, Sonnagh, Mullaghanoe, Owengarve, Eighnagh and Owenaher on the east side. The underlying geology is Carboniferous Limestone for the most part, though Carboniferous Sandstone is present at the extreme west of the site, with Dalradian Quartzites and schists at the south-west. Some of the tributaries at the east, the south of Lough Conn and all of Lough Cullin are underlain by granite. There are many towns adjacent to but not within the site. These include Ballina, Crossmolina, Foxford, Swinford, Kiltimagh and Charlestown.

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):*

- *[7110] Raised Bog (Active)**
- *[7120] Degraded Raised Bog*
- *[7150] Rhynchosporion Vegetation*
- *[7230] Alkaline Fens*
- *[91A0] Old Oak Woodlands*
- *[91E0] Alluvial Forests**
- *[1092] White-clawed Crayfish (Austropotamobius pallipes)*
- *[1095] Sea Lamprey (Petromyzon marinus)*
- *[1096] Brook Lamprey (Lampetra planeri)*
- *[1106] Atlantic Salmon (Salmo salar)*
- *[1355] Otter (Lutra lutra)*

On the slopes and rising ground around the southern shores of Loughs Conn and Cullin, oak woodlands are found. Sessile Oak (Quercus petraea) is the dominant tree species, with an understorey of Holly (Ilex aquifolium), Hazel (Corylus avellana) and Downy Birch (Betula pubescens), with some Ash (Fraxinus excelsior). Additional species are associated with the lakeshore such as Rock Whitebeam (Sorbus rupicola), Aspen (Populus tremula), Silver Birch (B. pendula) and the shrubs Guelder-rose (Viburnum opulus), Buckthorn (Rhamnus catharticus) and Spindle (Euonymus europaeus). The ground flora is

usually composed of Bilberry (Vaccinium myrtillus), Great Wood-rush (Luzula sylvatica), Wood-sorrel (Oxalis acetosella), buckler-ferns (Dryopteris aemula and D. dilatata), Hard Fern (Blechnum spicant), Common Cowwheat (Melampyrum pratense) and Bracken (Pteridium aquilinum). The rare Narrowleaved Helleborine (Cephalanthera longifolia), protected under the Flora (Protection) Order, 1999, occurs in association with the woodlands. Also found in these woodlands is the snail Spermodea lamellata, a species associated with old natural woodlands.

Alluvial woodland occurs at several locations along the shores of the lakes but is particularly well developed along the river at Coryosla Bridge. Principal tree species are willows (including Salix cinerea subsp. oleifolia) and Alder (Alnus glutinosa). Herbaceous species include Royal Fern (Osmunda regalis), Meadowsweet (Filipendula ulmaria) and Reed Canary-grass (Phalaris arundinacea). The woods are flooded by seasonal fluctuations in lake level.

On higher ground adjacent to the woodlands is blanket bog with scattered shrubs and trees on the drier areas. The rocky knolls often bear Juniper (Juniperus communis) or Gorse (Ulex europaeus), with some unusual rare herb species such as Intermediate Wintergreen (Pyrola media) and Lesser Twayblade (Listera cordata).

Within the site are a number of raised bogs including those at Kilgarriff, Gowlaun, Derrynabrock, Tawnaghbeg and Cloongoonagh. These are examples of raised bogs at the north-western edge of the spectrum and possess many of the species typical of such in Ireland, including an abundance of Bog Asphodel (Narthecium ossifragum), Carnation Sedge (Carex panicea) and the moss Campylopus atrovirens. Some of the bogs include significant areas of active raised bog habitat. Well developed pool and hummock systems with quaking mats of bog mosses (Sphagnum spp.), Bog Asphodel and White Beaked-sedge (Rhynchospora alba) are present. Many of the pools contain a diversity of plant species, including Bogbean (Menyanthes trifoliata), the bog moss Sphagnum cuspidatum, Campylopus atrovirens, Common Cottongrass (Eriophorum angustifolium), Great Sundew (Drosera anglica) and occasional Lesser Bladderwort (Utricularia minor). Several of the hummock-forming mosses (Sphagnum fuscum and S. imbricatum) which occur here are quite rare in this region and add to the scientific interest of the bogs within the overall site.

Depressions on the bogs, pool edges and erosion channels, where the vegetation isdominated by White Beaked-sedge comprise the habitat 'Rhynchosporion vegetation'. Associated species in this habitat at the site include Bog Asphodel, sundews, Deergrass (Scirpus cespitosus) and Carnation Sedge.

Degraded raised bog is present where the hydrology of the uncut bogs has been affected by peat cutting and other land use activities in the surrounding area, such as afforestation and associated drainage, and also the Moy arterial drainage. Species typical of the active raised bog habitat may still be present but the relative abundances differ. A typical example of the degraded habitat, where drying has occurred at the edge of the high bog, contains an abundance and more uniform cover of Heather (Calluna

vulgaris), Carnation Sedge, Deergrass and sometimes Bog-myrtle (Myrica gale). Occurring in association with the uncut high bog are areas of wet regenerating cutover bog with species such as Common Cottongrass, bog mosses and sundew, while on the drier areas, the vegetation is mostly dominated by Purple Moor-grass (Molinia caerulea). Natural regeneration with peat-forming capability will be possible over time with some restorative measures.

Alkaline fen is considered to be well developed within the site. An extensive stand occurs as part of a wetland complex at Mannin and Island Lakes on the Glore River. Key diagnostic species of the Schoenus association characteristic of rich fens include the bryophytes Campylium stellatum, Aneura pinguis and Scorpidium scorpioides, and the herbaceous species Long-stalked Yellow-sedge (Carex lepidocarpa), Grass-of parnassus (Parnassia palustris) and Common Butterwort (Pinguicula vulgaris). Other fen species include Black Bog-rush (Schoenus nigricans), Purple Moor-grass, Marsh Helleborine (Epipactis palustris), Meadow Thistle (Cirsium dissectum) and Bluntflowered Rush (Juncus subnodulosus). The rare moss Bryum uliginosum occurs on exposed marl at a ditch to the east of Island Lake.

The open water of Loughs Conn and Cullin is moderately hard with relatively low colour and good transparency. The phytpoplankton of the lake is dominated by diatoms and blue-green algae and there is evidence that the latter group is more common now than in former years. This indicates that nutrient inflow is occurring. The changes in Lough Conn appear to represent an early phase in the eutrophication process. Stoneworts still present include Chara aspera, C. delicatula and Nitella cf. opaca. Other plants found in the shallower portions include pondweed species (Potamogeton spp.). Where there is a peat influence Intermediate Bladderwort (Utricularia intermedia) is characteristic, while Water Lobelia (Lobelia dortmanna) often grows in sand. Narrow reedbeds and patches of Yellow Water-lily (Nuphar lutea) occur in some of the bays.

Drainage of the Moy in the 1960s lowered the level of the lakes, exposing wide areas of stony shoreline and wet grassland, which are liable to flooding in winter. This increased the habitat diversity of the shoreline and created a number of marginal wetlands, including fens and marshes. Plant species of note in the lake-margin include Heath Cudweed (Omalotheca sylvatica), Great Burnet (Sanguisorba officinalis) and Irish Lady's-tresses (Spiranthes romanzoffiana). These three species are listed on the Irish Red Data list and are protected under the Flora (Protection) Order, 1999.

Other habitats present within the site include wet grassland dominated by rushes (Juncus spp.) grading into species-rich marsh in which sedges are common. Among the other species found in this habitat are Yellow Iris (Iris pseudacorus), Water Mint (Mentha aquatica), Purple Loosestrife (Lythrum salicaria) and Soft Rush (Juncus effusus).

Rusty Willow (Salix cinerea subsp. oleifolia) scrub and pockets of wet woodland dominated by Alder (Alnus glutinosa) have become established in places throughout the site. Ash (Fraxinus excelsior) and Downy Birch (Betula pubescens) are common in the latter and the ground flora is typical of wet

woodland with Meadowsweet (Filipendula ulmaria), Wild Angelica (Angelica sylvestris), Yellow Iris, horsetails (Equisetum spp.) and occasional tussocks of Greater Tussock-sedge (Carex paniculata).

Small pockets of conifer plantation, close to the lakes and along the strip both sides of the rivers, are included in the site.

The Moy system is one of Ireland's premier salmon waters and it also encompasses two of Ireland's best lake trout fisheries in Loughs Conn and Cullin. Although the Atlantic Salmon (Salmo salar) is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. The Moy is a most productive catchment in salmon terms and this can be attributed to its being a fingered system with a multiplicity of 1st to 5th order tributaries which are large enough to support salmonids < 2 years of age while at the same time being too small to support significant adult trout numbers and are therefore highly productive in salmonid nursery terms.

Salmon run the Moy every month of the year. Both multi-sea-winter fish and grilse are present. The salmon fishing season is 1st February to 30th September. The peak of the spring fishing is in April and the grilse begin running in early May. The average weight of the spring fish is 9 lb and the grilse range from about 3-7 lb. In general spring fish are found more frequently in the rivers at the western extent of the Moy system.

The Arctic Char (Salvelinus alpinus), an interesting relict species from the last ice age, which is listed as threatened in the Irish Red Data Book has been recorded from Lough Conn and in only a few other lakes in Ireland. The latest reports suggest that it may now have disappeared from the site.

The site is also important for the presence of four other species listed on Annex II of the E.U. Habitats Directive, namely Sea Lamprey, Brook Lamprey, Otter and Whiteclawed Crayfish. The Sea Lamprey is regularly encountered in the lower stretches of the river around Ballina, while the Otter and White-clawed Crayfish are widespread throughout the system. In addition, the site also supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger, Irish Hare and Daubenton's Bat. Common Frog, another Red Data Book species, also occurs within the site.

Loughs Conn and Cullin support important concentrations of wintering waterfowl and both are designated Special Protection Areas (SPAs). A nationally important population of the Annex I species Greenland White-fronted Goose (average 113 over 6 winters 1994/95 to 1999/00) is centred on Lough Conn. Whooper Swans also occur (numbers range between 25 to 50), along with nationally important populations of Tufted Duck 635, Goldeneye 189 and Coot 464. A range of other species occur on the lakes in regionally important concentrations, notably Wigeon 303, Teal 154, Mallard 225, Pochard 182,

Lapwing >1,000 and Curlew 464. Golden Plover also frequent the lakes, with numbers ranging between 700 and 1,000.

Loughs Conn and Cullin are one of the few breeding sites for Common Scoter in Ireland. Breeding has occurred on Lough Conn since about the 1940s when about 20-30 pairs were known. A census in 1983 recorded 29 pairs. Breeding was first proved on Lough Cullin in 1983 when 24 pairs were recorded. In 1995, 24-26 pairs were recorded at Lough Conn and 5 pairs at Lough Cullin. The latest survey in 1999 gives a total of 30 birds for both lakes, comprising only 5 pairs, 18 unpaired males and 2 unpaired females. The reason for the decline is not known but may be due to predation by mink, possible changes in food supply and/or redistribution to other sites. The Common Scoter is a Red Listed species.

Agriculture, with particular emphasis on grazing, is the main land use along the Moy. Much of the grassland is unimproved but improved grassland and silage fields are also present. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the large lakes. Fishing is the main tourist attraction on the Moy and there are a large number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The North Western Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Other aspects of tourism are concentrated around Loughs Conn and Cullin.

Afforestation has occurred in the past around the shores of Loughs Conn and Cullin. The coniferous trees are due for harvesting shortly. It is proposed to replant with native tree species in this area. Forestry is also present along many of the tributaries and in particular along the headwaters of the Deel. Forestry poses a threat in that sedimentation and acidification can occur. Sedimentation can cover the gravel beds resulting in a loss of suitable spawning grounds. The Moy was arterially dredged in the 1960s. Water levels have been reduced since that time. This is particularly evident along the shores of Loughs Conn and Cullin and in the canal-like appearance of some river stretches. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as examples of other important habitats. The presence of a fine example of broadleaved woodland in this part of the country increases the overall habitat diversity and adds to the ecological value of the site, as does the presence of the range of nationally rare and Red Data Book plant and animal species.

3.2. Conservation Objectives of European Sites

3.2.1. River Moy SAC [002298]. Version 1. 3rd August 2016

Specific Conservation Objectives and Target Notes are set by the NPWS (Version 1. 3rd August 2016) for River Moy SAC [002298] as follows:

Conservation Objectives for : River Moy SAC [002298]

7110 Active raised bogs

To restore the favourable conservation condition of Active raised bogs in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Restore area of active raised bog to 132.4ha, subject to natural processes	There are five raised bogs listed for River Moy SAC. The total area of Active Raised Bog (ARB) habitat for these five bogs was mapped at 45.3ha. Area of Degraded Raised Bog (DRB) on the High Bog (HB) has been modelled as 152.4ha. See map 3. However, it is estimated that only 82.1ha is potentially restorable to ARB by drain blocking. The total potential ARB on the HB is therefore estimated to be 127.4ha. Eco-hydrological assessments of the cutover estimates that an additional 5.0ha of bog forming habitats could be restored. The long term target for ARB is therefore 132.4ha. See raised bog supporting document for further details on this and following attributes
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC. See map 4 for most recently mapped distribution	ARB occurs on most of the bogs in the River Moy SAC. DRB occurs on all five bogs in the River Moy SAC. There is also potential for ARB restoration on cutover areas surrounding the bogs (see area target above)
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog. See map 3	The area of high bog within the five raised bogs listed for River Moy SAC in 2012 (latest figure available) was 498.4ha (DAHG 2014)
Hydrological regime: water levels	Centimetres	Restore appropriate water levels throughout the site	For ARB, mean water level needs to be near or above the surface of the bog lawns for most of the year. Seasonal fluctuations should not exceed 20cm, and should only be 10cm below the surface, except for very short periods of time. Open water is often characteristic of soak systems
Hydrological regime: flow patterns	Flow direction; slope	Restore, where possible, appropriate high bog topography, flow directions and slopes. See map 5 for current situation	ARB depends on mean water levels being near or above the surface of bog lawns for most of the year. Long and gentle slopes are the most favourable to achieve these conditions. Changes to flow directions due to subsidence of bogs can radically change water regimes and cause drying out of high quality ARB areas and soak systems
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Hectares; distribution	Restore adequate transitional areas to support/protect active raised bog and the services it provides	ARB is threatened due to effects of past drainage and peat-cutting around the margins of the bogs within the River Moy SAC. Natural marginal habitats no longer exist. Eco-hydrological assessments have evaluated the potential for ARB restoration on cutover areas (see note for habitat area attribute above)
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Hectares	Restore 66.2ha of central ecotope/active flush/soaks/bog woodland as appropriate	At least 50% of ARB habitat should be high quality (i.e. central ecotope, active flush, soaks, bog woodland). Target area of active raised bog for the site has been set at 132.4ha (see area target above)
Vegetation quality: microtopograph-ical features	Hectares	Restore adequate cover of high quality microtopographical features	High quality microtopography (hummocks, hollows and pools) is well developed in less disturbed parts of the bogs in River Moy SAC
Vegetation quality: bog moss (*Sphagnum*) species	Percentage cover	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peat-forming capacity	*Sphagnum* cover varies naturally across Ireland with relatively high cover in the east to lower cover in the west. Hummock forming species such as *Sphagnum austinii* are particularly good peat formers. *Sphagnum* cover and distribution also varies naturally across a site

Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora	Typical flora species include widespread species, as well as those with more restricted distributions but typical of the habitat's subtypes or geographical range
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna	Typical fauna species include widespread species, as well as those with more restricted distributions but typical of the habitat's subtypes or geographical range
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes	An important feature of interest in relation to the raised bogs in the River Moy SAC is the fact that they occur at the north-western edge of the geographic range of the habitat in Ireland
Negative physical indicators	Percentage cover	Negative physical features absent or insignificant	Negative physical indicators include: bare peat, algae dominated pools and hollows, marginal cracks, tear patterns, subsidence features such as dry mineral mounds/ridges emerging or expanding and evidence of burning
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels	Disturbance indicators include species indicative of conditions drying out such as abundant bog asphodel (*Narthecium ossifragum*), deergrass (*Trichophorum germanicum*) and harestail cotton-grass (*Eriophorum vaginatum*) forming tussocks; abundant magellanic bog-moss (*Sphagnum magellanicum*) in pools previously dominated by *Sphagnum* species typical of very wet conditions (e.g. feathery bog-moss (*S. cuspidatum*)); and indicators of frequent burning events such as abundant *Cladonia floerkeana* and high cover of carnation sedge (*Carex panicea*) (particularly in true midlands raised bogs)
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover	Most common non-native invasive species include lodgepole pine (*Pinus contorta*), rhododendron (*Rhododendron ponticum*), and pitcherplant (*Sarracenia purpurea*)
Air quality: nitrogen deposition	kg N/ha/year	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	Change in air quality can result from fertiliser drift; adjacent quarry activities; or other atmospheric inputs. The critical load range for ombrotrophic bogs has been set as between 5 and 10kg N/ha/yr (Bobbink and Hettelingh, 2011). The latest N deposition figures for the area around the bogs in River Moy SAC suggests that the current level is approximately 8.5kg N/ha/yr (Henry and Aherne, 2014)
Water quality	Hydrochemical measures	Water quality on the high bog and in transitional areas close to natural reference conditions	Water chemistry within raised bogs is influenced by atmospheric inputs (rainwater). However, within soak systems, water chemistry is influenced by other inputs such as focused flow or interaction with underlying substrates. Water chemistry in areas surrounding the high bog varies due to influences of different water types (bog water, regional groundwater and run-off from surrounding mineral lands)

Conservation Objectives for : River Moy SAC [002298]

7120 Degraded raised bogs still capable of natural regeneration

The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in River Moy SAC

Conservation Objectives for : River Moy SAC [002298]

7150 Depressions on peat substrates of the Rhynchosporion

Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in River Moy SAC

Conservation Objectives for : River Moy SAC [002298]

7230 Alkaline fens

To maintain the favourable conservation condition of Alkaline fens in River Moy 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	The full extent of of this habitat within the SAC is unknown. An extensive area is known to occur as part of a wetland complex on the Glore River, north-west of Ballyhaunis but there are likely to be other areas present in the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes	Full distribution of the habitat in this SAC is currently unknown- see note above
Hydrological regime	Metres	Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	Maintenance of groundwater, surface water flows and water table levels within natural ranges is essential for this wetland habitat
Peat formation	Flood duration	Active peat formation, where appropriate	In order for peat to form, water levels need to be slightly below or above the soil surface for c.90% of the time (Jim Ryan, pers. comm.)
Water quality: nutrients	Water chemistry measures	Appropriate water quality to support the natural structure and functioning of the habitat	Fens receive natural levels of nutrients (e.g. iron, magnesium and calcium) from water sources. However, they are generally poor in nitrogen and phosphorus with the latter tending to be tbe limiting nutrient
Vegetation structure: typical species	Percentage	Maintain vegetation cover of typical species including brown mosses and vascular plants	Mosses listed for fen in this SAC include *Campylium stellatum, Aneura pinguis* and *Scorpidium scorpioides* while vascular plants include long-stalked yellow sedge (*Carex lepidocarpa*), black bog rush (*Schoenus nigricans*), blunt-flowered rush (*Juncus subnodulosus*), purple moor-grass (*Molinia caerulea*), grass of Parnassus (*Parnassia palustris*), butterwort (*Pinguicula vulgaris*), marsh helleborine (*Epipactis palustris*) and meadow thistle (*Cirsium dissectum*) (internal NPWS files)
Vegetation composition: trees and shrubs	Percentage	Cover of scattered native trees and shrubs less than 10%	Scrub and trees will tend to invade if fen conditions become drier. Attribute and target based on upland habitat conservation assessment criteria (Perrin et al., 2014)
Physical structure: disturbed bare ground	Percentage	Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%	While grazing may be appropriate in this habitat, excessive areas of disturbed bare ground may develop due to unsuitable grazing regimes. Attribute and target based on upland habitat conservation assessment criteria (Perrin et al., 2014)
Physical structure: drainage	Percentage	Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%	Attribute and target based on upland habitat conservation assessment criteria (Perrin et al., 2014)

Conservation Objectives for : River Moy SAC [002298]

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

To maintain the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in River Moy 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	Old sessile oakwoods are likely to occur as mosaics with other woodland types and the total extent within the SAC is unknown. Two sites (1763, 1800) in the SAC were surveyed as part of the the National Survey of Native Woodlands (NSNW) (Perrin et al., 2008). Site 1763 (Pontoon) is an extensive area of woodland and 106.3ha was mapped as this Annex I habitat type (or mosaics containing it). See map 6. NB further areas are likely to be present within the SAC
Habitat distribution	Occurrence	No decline. Woodlands surveyed as part of the NSNW are shown on map 6	The main location of this woodland type in the SAC is Pontoon Woods. See note on area above
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 sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring "deep" woodland conditions (Peterken, 2002). Topographical and land ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al (2008)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak (*Quercus* spp.) regenerates poorly. In suitable sites ash (*Fraxinus excelsior*) can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin and Daly (2010) list Pontoon Wood as possible ancient woodland
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (*Fagus sylvatica*), sycamore (*Acer psudoplatanus*), rhododendron (*Rhododendron ponticum*) and cherry laurel (*Prunus laurocerasus*)

Conservation Objectives for : River Moy SAC [002298]

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

To maintain the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) in River Moy 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	Total extent of this habitat within the SAC is unknown and it may occur in mosaics with other woodland types. Two sites (1763, 1800) within the SAC were surveyed as part of the the National Survey of Native Woodlands (NSNW) (Perrin et al., 2008). Map 6 shows surveyed woodlands including areas classified as 91E0 (2.76ha). NB areas mapped as other wet woodland types may also correspond with this Annex I woodland type. There are also likely to be additional areas of this Annex I woodland type within the SAC
Habitat distribution	Occurrence	No decline. Woodlands surveyed as part of the NSNW are shown on map 6	The area of this habitat identified by the NSNW occurs at Prospect (site 1800) on the western shore of Lough Conn. See note on area above
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 sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical and land-ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Alder (*Alnus glutinosa*) and oak (*Quercus* spp.) regenerate poorly. Ash (*Fraxinus excelsior*) often regenerates in large numbers although few seedlings reach pole size
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river floodplains and lakeshores
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species

Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including including alder (*Alnus glutinosa*), willows (*Salix* spp.), oak (*Quercus robur*) and ash (*Fraxinus excelsior*)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: sycamore (*Acer pseudoplatanus*) and Himalayan balsam (*Impatiens glandulifera*). The NSNW notes rhododendron (*Rhododendron ponticum*) clearance in site 1800

Conservation Objectives for : River Moy SAC [002298]

1092 White-clawed Crayfish *Austropotamobius pallipes*

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

Attribute	Measure	Target	Notes
Distribution	Occurrence	No reduction from baseline. See map 7	The general distribution of white-clawed crayfish in the SAC is that it is widespread in the upper tributaries of the River Moy and the rivers which feed Loughs Conn and Cullin. It is absent from the main River Moy. The named tributaries that it is recorded from are the following: Upstream of Lough Conn: River Deel and its tributaries of the Toreen River, Rathnamagh River and Rappa Stream; Fiddaunglass; Addergoole River. Upstream of Lough Cullin: Tobergal River; Clydagh; tributaries of the Toormore and Manulla Rivers. Moy tributaries: Gweestion River; tributaries of the Pollagh, Glore, Yellow and Geestaun Rivers; Killeen River; Spaddagh River; Sonnagh River; Owenaher River; Owengarve River
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries	See Reynolds et al. (2010) for further details
Negative indicator species	Occurrence	No alien crayfish species	Alien crayfish species are identified as a major direct threat to this species and as a disease vector. See Reynolds (1998) for further details. Ireland is currently free of non-native invasive crayfish species
Disease	Occurrence	No instances of disease	Crayfish plague is identified as major threat and has occurred in Ireland even in the absence of alien vectors. See Reynolds (1998) for further details. Disease can in some circumstances be introduced through contaminated equipment and water in the absence of vector species
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	Target taken from Demers and Reynolds (2002). Q values based on triennial water quality surveys carried out by the EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Crayfish need high habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions must be available on the whole length of occupied habitat

Conservation Objectives for : River Moy SAC [002298]

1095 Sea Lamprey *Petromyzon marinus*

To maintain the favourable conservation condition of Sea Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	This SAC only covers the freshwater portion of the River Moy. The adjacent Killala Bay/Moy Estuary SAC (site code: 000485) encompasses the estuarine elements of sea lamprey habitat. Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas (Rooney et al. 2015), however, there are no artificial barriers in the Moy catchment limiting lamprey access
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Attribute and target based on Harvey and Cowx (2003) and O'Connor (2007)
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density at least 1/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on Harvey and Cowx (2003)
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Silting habitat is essential for larval lamprey and they can be severely impacted by sediment removal. Recovery can be rapid and newly-created habitat can be rapidly colonised (King et al., 2015). However, it is vital that such sedimenting habitats are retained. Occupancy in excess of 50% of sites would be 'reasonable' for the Irish catchments examined to date. (King and Linnane, 2004; King et al., unpublished data)

Conservation Objectives for : River Moy SAC [002298]

1096 Brook Lamprey *Lampetra planeri*

To maintain the favourable conservation condition of Brook Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage of river accessible	Access to all watercourses down to first order streams	Artificial barriers can block lampreys' migration both up- and downstream, thereby possibly limiting species to specific stretches, restricting access to spawning areas and creating genetically isolated populations (Espanhol et al., 2007). However, there are no artificial barriers in the Moy catchment limiting lamprey access
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Attribute and target based on data from Harvey and Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field (Gardiner, 2003), hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Silting habitat is essential for larval lamprey and they can be severely impacted by sediment removal. Recovery can be rapid and newly-created habitat can be rapidly colonised (King et al., 2015). However, it is vital that such sedimenting habitats are retained. Occupancy in excess of 50% of sites would be 'reasonable' for the Irish catchments examined to date. (King and Linnane, 2004; King et al., unpublished data)

Conservation Objectives for : River Moy SAC [002298]

1106 Salmon *Salmo salar*

To maintain the favourable conservation condition of Salmon in River Moy 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. There are no artificial barriers on the Moy catchment limiting salmon access
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	A conservation limit is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2016). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. For the 2016 SSC advice, the Moy is currently exceeding its CL by 19,012 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. There are no artificial barriers preventing salmon from accessing suitable spawning habitat in this SAC
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)

Conservation Objectives for : River Moy SAC [002298]

1355 Otter *Lutra lutra*

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

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha	No field survey. Areas mapped to include 10m terrestrial buffer along lake shorelines and along river banks identified as critical for otters (NPWS, 2007)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 479.4km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase. For guidance, see map 8	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

3.3. Description of the Existing Environment

3.3.1. Habitats & Flora

The site comprises two fields of Wet grassland/Marsh (GS4/GM1) which are divided by a central drainage ditch (FW4) clearly visible in Figure 2 with the southwestern boundary 'Maiden River' leading to the Tubbercurry Stream further to the west.

The category buildings and artificial surfaces (BL3) refers to the buildings on site.

There are patches of bare ground and spoil (ED) close to the roadside boundary which have experienced varying levels of disturbance in the past.

There were no signs of invasive species on the proposed development site.

3.3.2. Fauna

Otters

A review of the NBDC database revealed only one record from 1990 from the Tubbercurry Stream in the 1 km square downstream of the town.

There were no signs of otters or otter resting places on the proposed development site.

3.4. Consideration of Impacts on European Sites

3.4.1. Habitats Directive Annex I Habitats

There would be no direct impacts on the Moy River SAC European site and there would be no habitat loss or fragmentation as a result of the proposed development. Having considered direct impacts and ruling them out, indirect impacts are then considered in terms of source pathway vectors.

Considering a worst-case scenario whereby the project may result in a significant detrimental change in water quality in the River Moy either alone or in combination with other projects or plans as a result of indirect pollution, the effect would have to be considered in terms of changes in water quality which would significantly affect the habitats or food sources for which the Moy River European site is designated.

The effect could arise from a significant release of elevated suspended solids or from chemical pollution from hydrocarbons which would have mortality effects on Salmon, Lamprey or affect Otters or Otter food sources.

3.4.2. Habitats Directive Annexed Species

The main considerations for Habitats Directive Annexed Species is with regard to those species associated with the aquatic environment downstream of the proposed development including White-clayed Crayfish, Lamprey, Salmon and Otters.

White-clawed Crayfish

There are no records of White-clawed crayfish in the 1 km square in which the proposed development is located (NBDC) or in the river channels downstream of the Tubbercurry Stream (NPWS Conservation Objectives Document).

Lamprey

All three species of Lamprey are likely to occur in the downstream channels of the main River Moy System.

There will be no direct impacts on Lamprey species and so the main consideration is with regard to indirect impacts on water quality.

Salmon

The River Moy Fishery is one of the most prolific salmon fisheries in Ireland and is registered as a Salmonid Water under the Salmonid Regulations. Salmonid waters are included within the Register as areas protected for water dependent species and habitats. The protected areas for Salmonid species are comprised of the 34 Salmonid rivers, tributaries and lakes listed in the Salmonid Regulations (S.I. 293 / 1988).

The adjacent water courses are not suitable for migrating or spawning salmon and there will be no direct effects on Salmon and so the main consideration is with regard to indirect impacts on water quality.

Otter

The otter *Lutra lutra* is listed under Annex II of the EU Habitats Directive and under Annex II of the Berne Convention; it is also a legally protected species under the Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000). Otters are found throughout Ireland and tend to occupy linear territories along watercourses and are rarely found far away from water. This species is listed as one of the qualifying interests of the River Moy SAC.

There will be no direct impact on otters or on otter resting places or holts. Commuting otters are relatively accustomed to low levels of human activity and in any case will commute at night when human activity is lowest.

A worst-case scenario may be considered whereby the Project may result in a significant detrimental change in water quality in the River Moy either alone or in combination with other projects or plans as a result of indirect pollution. The effect would have to be considered in terms of changes in water quality which would affect the habitats or food sources on which otters rely.

3.4.3. Ecological Network Supporting Natura 2000 Sites

An analysis of the proposed Natural Heritage Areas and designated Natural Heritage Areas in terms of their role in supporting the species using Natura 2000 sites was undertaken. These supporting roles

mainly relate to mobile fauna such as mammals and birds which may use pNHAs and NHAs as "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account during the AA process.

There are no other designated or proposed designated sites or areas of semi-natural habitat that would be affected by the proposed development.

3.5. Impacts on the Qualifying Interests of European Sites

3.5.1. Direct Impacts

There will be no direct impacts on the SAC conservation areas as a result of the construction and operation of the proposed development given the distance from the European sites. Direct impact refers to physical impacts defined in the Departmental Guidance as 'Loss of habitat area' and/or 'Habitat Fragmentation'. There are no direct impacts identified which may affect the Annex I habitats and Annex II species of the River Moy SAC.

The construction works of the proposed development will have no impacts upon the integrity or the site structure of the European sites considered. There is an adequate distance between the proposed development site and designated areas to ensure that no direct impacts will occur.

Having established this, the assessment emphasis is placed on potential indirect and cumulative impacts.

The primary consideration in terms of source-vector-pathways for indirect impacts relates to surface water and potential indirect impacts on hydrologically linked habitats and aquatic species via the Tubbercurry Stream.

3.5.2. Indirect Impacts

Consideration of impacts on Surface Water

Considering a worst-case scenario whereby the project may result in a significant detrimental change in water quality in the River Moy either alone or in combination with other projects or plans as a result of indirect pollution, the effect would have to be considered in terms of changes in water quality which would significantly affect the habitats or food sources for which the River Moy European sites are designated.

The effect could arise from a significant release of elevated suspended solids or from chemical pollution from hydrocarbons which would have mortality effects on Salmon, Lamprey or affect Otters or Otter food sources.

There would be no direct impacts on Otters and so the main concern is with regard to water quality and indirect impacts on water quality and prey species.

Best Practice Construction Management will be outlined in a Construction Environmental Management Plan (CEMP) and implemented during the construction phase. Management measures will include appropriate site-specific measures from the CIRIA Report C532 Control of Water Pollution from Construction Sites. The CEMP will be prepared for the Construction phase of the proposed development.

3.6. Mitigation Measures

Protection of Surface Water

Best Practice Construction Management will be outlined in a Construction Environmental Management Plan (CEMP) and implemented during the construction phase. Management measures will include appropriate site-specific measures from the CIRIA Report C532 Control of Water Pollution from Construction Sites.

The CEMP will include a reference to this Appropriate Assessment which establishes the connectivity to the River Moy SAC and the requirement for avoidance in terms of both direct and indirect construction activity, e.g. machinery will not enter water courses and construction management will avoid indirect pollution of water courses.

The contractor will be required to put in place such measures to prevent silt entering the Maiden River and Tubbercurry Stream at the most western extent of the drainage ditch from the site. The measure may include the use of silt fencing or trapping at a suitable level to prevent silt laden water from washing downstream.

In order to reduce the risk of contamination arising as a result of spills or leakages, measures including, but not limited to, the following will be employed:

- Provision of a water and sediment management plan, providing for means to ensure that surface water run-off is controlled such that no silt or other pollutants enter local water courses or drains.

- All re-fuelling of plant, equipment and vehicles will be carried out either offsite or at a construction compound.
- All fuels, chemicals, liquid and solid waste will be stored in areas bunded in accordance with established best practice guidelines at the construction compound also; and
- Provision of spill kits.

Specific measures will be included in the CEPM regarding the pedestrian crossing of the Maiden River. These will include prevention of siltation or contamination of the water course during the placement of the bridge.

The CEMP will be prepared with the input of a suitably qualified ecologist and the ecologist will be required to be present during the bridge placement as an Ecological Clerk of Works to monitor the effectiveness of the proposed avoidance measures.

In addition to these specific measures the following general measures are to be included in the CEMP:

General

Prior to any works, all personnel involved will receive an on-site induction relating to operations adjacent to watercourses and the environmentally sensitive nature of the River Moy and re-emphasise the precautions that are required as well as the construction management measures to be implemented.

The project proponent will ensure that the engineer setting out the works is fully aware of the ecological constraints and construction management requirements.

Fuel/Lubricant spillage from equipment

- Chemicals used will be stored in sealed containers.
- Chemicals shall be applied in such a way as to avoid any spillage or leakage.
- All refuelling, oiling and greasing will take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses and away from drains and watercourses as far as reasonably practicable. Vehicles will not be left unattended during refuelling.
- It is proposed that the construction compound will be located within the site boundary.
- Storage areas, machinery depots and site offices will be located within the site boundary.
- Spill kits will be made available and all staff will be properly trained on correct use.

- All fuels, lubricants and hydraulic fluids required to be stored on site will be kept in secure bunded areas at a minimum of 10m from water courses. The bunded area will accommodate 110% of the total capacity of the containers within it.
- Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place with all staff properly briefed. Any waste oils or hydraulic fluids will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.
- All plant shall be well maintained with any fuel or oil drips attended to on an ongoing basis.
- Any minor spillage during this process will be cleaned up immediately.
- Should any incident occur, the situation will be dealt with and coordinated by the nearest supervisor who will be responsible for instructions by the Local Authority.

Concrete

- Wet concrete and cement are very alkaline and corrosive and can cause serious pollution to watercourses.
- Disposal of raw or uncured waste concrete will be controlled to ensure that the water courses on site will not be impacted.
- Best practice in bulk-liquid concrete management addressing pouring and handling, secure shuttering / form-work, adequate curing times will be implemented.
- Wash water from cleaning ready mix concrete lorries and mixers may be contaminated with cement and is therefore highly alkaline, therefore, washing will not be permitted on site.

3.7. Assessment of In-Combination Effects

The Commission services' interpretation document 'Managing Natura 2000 sites', makes clear that the phrase 'in combination with other plans or projects' in Article 3(3) refers to cumulative effects caused by the projects or plans that are currently under consideration together with the effects of any existing or proposed projects or plans. When impacts are assessed in combination in this way, it can be established whether or not there may be, overall, an impact which may have significant effects on a Natura 2000 site or which may adversely affect the integrity of a site.

As part of the Screening for an Appropriate Assessment, in addition to the proposed works, other relevant projects and plans in the region must also be considered at this stage. This step aims to identify at this early stage any possible significant in-combination or cumulative effects / impacts of the proposed development with other such plans and projects.

The planning section of the Sligo County Council website was consulted, and Table 3 presents a list of applications that were granted permission in the vicinity of the proposed Project within the past three years.

Table 3. Recent planning applications to SCC in the locality of the proposed development site.

Planning Ref.	Development	Discussion
1764	retention of an extension to the side of the existing hotel comprising toilets, linen store, store and circulation and also in respect of an extension to the rear of the hotel comprising cold room and lobby, together with all ancillary site works and services	Planner's Report - Given the distance to the nearest Natura site, and as this is an application for an alteration to an existing hotel, it was considered that this is not required.
16508	development consisting of the construction of 4 new disabled car parking spaces together with associated site works (recorded in Sligo County Council Record of Protected Structures as St. John the Evangelist Church (RC) RPS No. 379)	Planner's Report - Given the distance to the nearest Natura 2000 site, and as this is an application for an alteration to an existing developed site, it was considered that this is not required.

There are no predicted in-combination effects with the developments in Table 3 given the reasons outlined in the discussion column of the table.

3.7.1. Conclusion of In-combination Effects

Given the inclusion of strict Best Practice Construction Measures to be included and enforced through a Construction Environmental Management Plan, the proposed development will have no predicted impacts on local ecology and biodiversity or on hydrologically linked European sites, therefore in-combination impacts can be ruled out.

The Sligo County Development Plan and Tubbercurry Local Area Plan in complying with the requirements of the Habitats Directive require that all Projects and Plans that could affect the Natura 2000 sites in the same zone of impact of the Project site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any, in-combination impacts with Plans or Projects for the development area and surrounding townlands in which the development site is located, would be avoided.

Any new applications for the Project area will be initially assessed on a case by case basis initially by Sligo County Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

4. Natura Impact Statement & Conclusion

This NIS has reviewed the predicted impacts arising from the Project and found that with the implementation of appropriate mitigation measures specifically with regard to surface water management during construction, significant effects on the integrity of the River Moy European sites can be ruled out.

It is the conclusion of this NIS that the implementation or the operation of the Project under the conditions of appropriate planning will not result in significant adverse effects to the conservation objectives or integrity of the River Moy SAC, or any other European Site, either alone or in combination with other plans or projects:

5. References

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of plans and projects in Ireland (as amended February 2010).

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission Environment DG (2002) 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 92/43EEC. European Commission, Brussels.

European Commission (2007) 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 interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

NPWS (2016) Conservation Objectives: River Moy SAC 002298. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2019) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data