# NATURA IMPACT STATEMENT (NIS)

## An Ecological Impact Assessment to Support

## The Appropriate Assessment Process

## Regarding a Proposed Planning Application

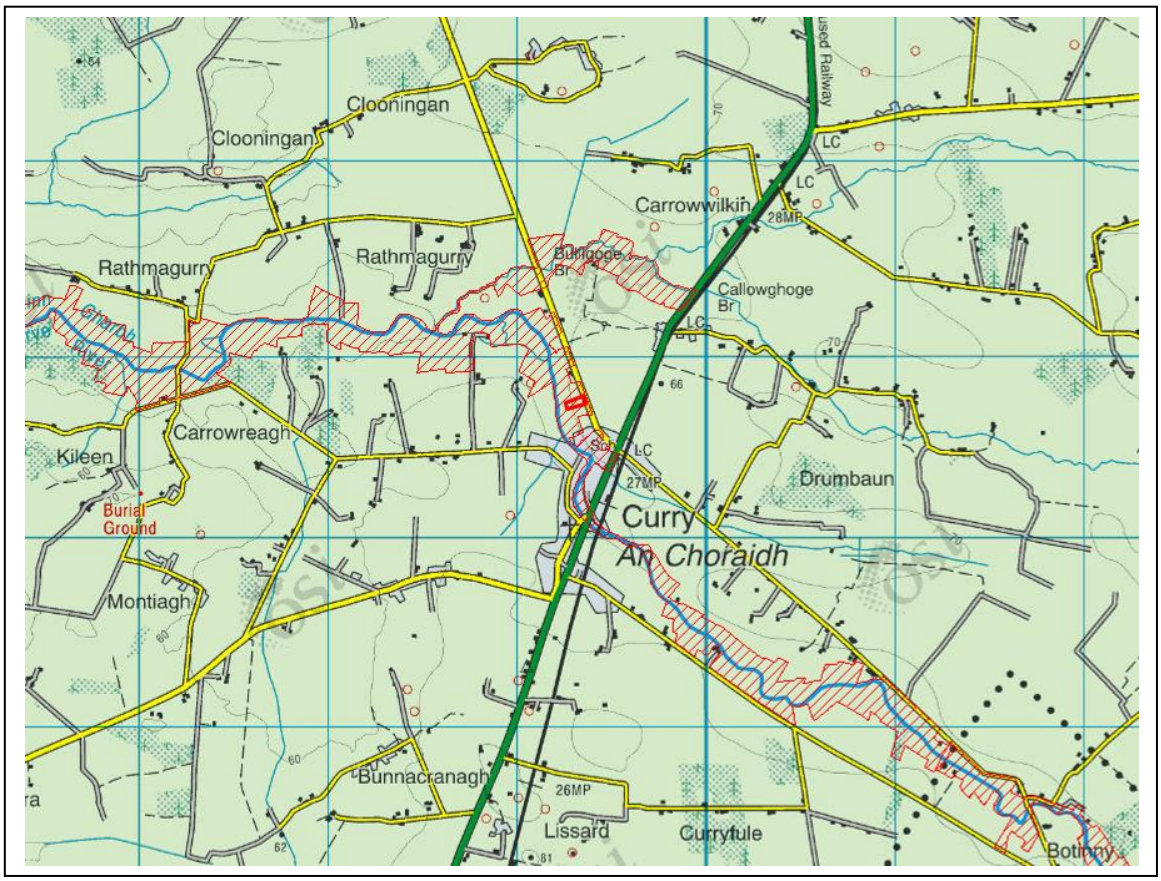
## For

## THE CONSTRUCTION OF A RESIDENTAL DWELLING HOUSE

## AT

## DRUMBAUN, CURRY,

## CO. SLIGO





**Client:** **Brendan & Aishling Brett**
**Drumbaun**
**Curry**
**Co. Sligo.**

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## APPENDICES

**ACKNOWLEDGEMENTS**

The Author wishes to acknowledge the essential contribution of National Parks and Wildlife whose maps, site synopsis, Natura Data forms and conservation objectives have enabled the compilation of this report.

# 1 INTRODUCTION

## 1.1 THE REQUIREMENT FOR AN ASSESSMENT UNDER ARTICLE 6

The requirement for appropriate assessment is set out in the ED Habitats Directive (92/43 EEC) in Article 6.3 which states:

> *'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, shali be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives'*

### 1.2 THE AIM OF THIS REPORT

This Natura Impact Statement (NIS) has been prepared in accordance with the current guidelines as prescribed by NPWS (NPWS, 2009, Revised February 2010), and provides an ecological impact assessment (EclA) for the proposed development of Brendan and Aishling Brett at Drumbaun, Curry, Co. Sligo**.**

The DOE in a communication entitled “Appropriate Assessment of plans and projects in Ireland, Guidance for planning authorities” have stated that “There are no prescribed methods for undertaking appropriate assessment, or form or content for reporting and although there are some worked examples of formats that can be used however these are not suitable where multiple sites have to be considered and particularly where a number of Natura sites within the 15Km radius of the proposed plan or project may be eliminated at a screening stage.

The NIS should provide sufficient data and information to the Local Authority in order to establish whether or not the proposed development is likely to have a significant impact on the Natura sites considered and impart sufficient information to assist the competent authority in its decision making process. Cognisance is taken of the Natura sites conservation objectives, indigenous species and specifically on the habitats for which the Natura 2000 conservation sites were designated. The Natura 2000 sites on which the NIS is based are as follows.

NHA’s do not have a statuatory designation and as such protection of such areas is restricted to (1) REPS / AEOS/ GLAS plans which require conservation of NHA’s and operate for a period of five years, (2) Forest service requirements for NPWS approval prior to payment of afforestation grants and (3) recognition of the ecological value of NHA’s by planning and licensing authorities. By performing the ecological impact assessment in a transparent logical sequence then, in relation to the habitats and species of the Natura sites, together with their conservation objectives, the NIS report should furnish sufficient information and data to satisfy the screening process required for the first stage of the process pursuant to Article 6.3 of the ED Habitats Directive. In addition the report should impart sufficient data to enable the Competent Authority to complete the Appropriate Assessment process if deemed necessary. No screening of the proposed project was carried out as it was determined that due to the location of the site within a Natura site that an NIS would be required due to the land take which was established through contact with NPWS..

Notes on the Author

The NIS has been undertaken by Paul Neary B.Sc. (Env. Sc.) M.Sc (eco tox), whom has previously carried out Ecological surveys and damage assessments on the Kerry Mountains, Ox Mountains, Shores of Lough Conn and Lough Cullin under the auspices of NPWS, he has also been involved in formulating management plans for National Parks and lectured in ecology. A number of his Appropriate Assessment reports have bee successfully defended by An Bord Pleanala in High Court actions taken by objectors whom wished to have the Boards decisions overturned. He has also submitted a number of remedial NIS's directly to An Bord Pleanala under section 261A of the Planning and Development Act, the findings of which have been ratified by the Bord.

### 1.3 CONSULTATION

#### 1.3.1 Government Departments

NPWS would be contacted by Sligo County Council during the normal course of the planning process and therefore, to avoid duplication, consultation with NPWS will be via that mechanism.

## *2 THE APPROPRIATE ASSESSMENT PROCESS*

### *2.1 INTRODUCTION*

There is a requirement, under Article 6(3) of the ED Habitats Directive (Directive 92/43/EEC), to carry out an Appropriate Assessment. The first step of the Appropriate Assessment process is to establish whether, in relation to a particular plan or project, Appropriate Assessment is required. Article 6(3) states:

> *'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the 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.'*

A number of guidance documents on the appropriate assessment process were consulted during the preparation of this NIS. These are:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (NPWS 2009, Revised February 2010);
- 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 (Nov. 2001 - published 2002); and
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007);

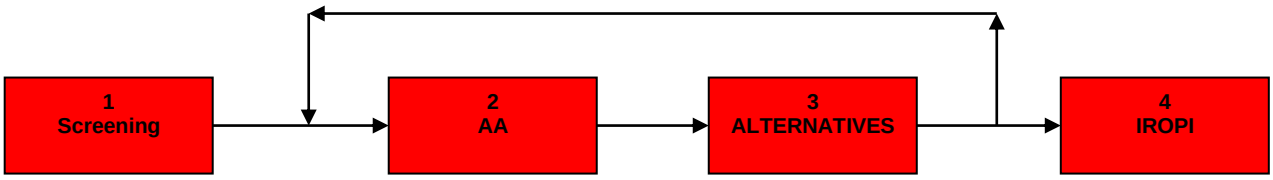
Where it cannot be deduced or proven with certainty that the development will not have a significant effect on the Natura 2000 sites then it is necessary and appropriate to carry out an appropriate assessment on the ramifications of the development on the sites with respect to their conservation objectives.The guidance for Appropriate Assessment (NPWS, 2009, revised February 2010) states:

*"AA is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4) and, for the purposes of this guidance, it comprises two main elements. Firstly a Natura Impact Statement - i.e. a statement of the likely and possible impacts of the plan or project on a Natura 2000 site (abbreviated in the following guidance to "NIS") must be prepared. This comprises a comprehensive ecological impact assessment of a plan or project; it examines the direct and indirect impacts that the plan or project might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites' conservation objectives. Secondly, the competent authority carries out the AA, based on the NIS and any other information it may consider necessary. The AA process encompasses all of the processes covered by Article 6(3) of the Habitats Directive, i.e. the screening process, the NIS, the AA by the competent authority, and the record of decisions made by the competent authority at each stage of the process, up to the point at which Article 6(4) may come into play following a determination that a plan or project may adversely affect the integrity of a Natura 2000 site".*

A High Court ruling in 2018 dictates that where an compensation or mitigations measures are applied to a plan or project then that plan or project must be assessed by means of a Natura Impact Assessment as opposed to a Screening Document.

## *2.2 STAGES*

The European Commission's guidance promotes a fours stage process, as set out in Box 1 below, to complete the Appropriate Assessment, and outlines the tests required at each stage. Stages 1 and 2 deal with the main requirements for assessment under Article 6.3 Stage 3 may be part of Article 6(3) or a necessary precursor for Stage 4.




This NIS includes the ecological impact assessment and testing required under the provisions of Article 6(3) by means of the first stage of Appropriate Assessment, the screening process (as set out in the EU Guidance documents).

EU guidance[1] states:

*"This stage examines the likely effects of a project or plan, either alone or in combination with other projects or plans, upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. This assessment comprises four steps:*

(1) *determining whether the project or plan is directly connected with or necessary to the management of the site;*

(2) *describing the project or plan and the description and characterisation of other projects or plans that in combination have the potential for having significant effects on the Natura 2000 site;*

(3) *identifying the potential effects on the Natura 2000 site;*

(4) *assessing the significance of any effects on the Natura 2000 site".*

The NIS also provides the information required for the Competent Authority to complete the Appropriate Assessment (Stage 2) if required.

[1] *Paragraph 3.1 of* '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 *(Nov. 2001)*

# 3 THE ECOLOGICAL IMPACT ASSESSMENT (EclA)

## 3.1 INTRODUCTION

The methodology employed with respect to the Ecological Impact Assessment for this Natura Impact Statement is cognisant of the EPA Advice Notes on Current Practice (2003); EPA 'Guidelines on the Information to be contained in Environmental Impact Statements' (2002), the Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (IEEM, 2006) and with reference to the National Roads Authority Guidelines (NRA) for ecological impact assessment (Revision *2,* 2009). The ecological assessment of the proposed development site is contained in the Appendix with this section primarily concerned with directing the reader to the relevant sections.

NHA's are included in the NIS where they are stand alone sites and where there is dual designation i.e. both an SPA or SAC and an NHA the natura site designation is considered in preference to the NHA designation. It is an objective, at EU level, to increase or expand the number and / or areas designated as SAC's or SPA's consequently there is a likelihood that certain NHA's (or section there of) will be re-designated at a future date which has implications for the section of the NIS which considers planned or contemplated nature conservation and / or Biodiversity targets. It is the considered opinion that the omission of the NHA's from the NIS process would result in the process being deficient and therefore they have being included. Not withstanding this it is the prerogative of the competent authority to include or omit these sites when completing the AA process however their inclusion, in this report, does not compromise the validity of the NIS generated. The proposed project is not necessary to the management of the site. The ecological characteristics of the Natura 2000 sites are described in Section 4 of this document which includes, where relevant, the conservation objectives for that site, followed by Assessment of Likely Effects, potential Mitigation and Residual impacts in Sections 5, 6 and 7 respectively. Conclusions are set out in section 8.
A summary description of the Project is provided in section 3.1.1. overleaf.

### 3.1.1 Description of the Project

The proposed project involves the construction of a new 4 bed 252.10M$^2$ domestic dwelling, a 48.97M$^2$ domestic garage, connection to the public sewer, installation of storm water soak pits, connection to the public water mains and all ancillary site works on a 0.404Ha green field site. The proposed project will involve short duration light construction works of approximately <6months. The proposed project is to connect to the Curry public sewer. The existing sewer system was upgraded in circa 2000 with the treatment plant (primary settlement, aeration, filter beds) designed for a p.e. of 400. The existing loading to the system is in the order of p.e.188 and when other planning permissions, granted but not started, are taken into consideration this brings the projected loading to the WWTP to 216. This indicates that the existing Curry WWTP has excess capacity and can easily cater for the additional 6p.e. loading associated with the proposed project.

### 3.1.2 Description of the Proposed Development Site

The North East facing site is located in the townland of Drumbaun with an address at Curry, Co. Sligo and is situated 267M North West of Curry National School, 265M West of the N17 Charlestown to Sligo Road, West of the Banada L4504 Road at grid reference 549292, 806719. It is located in the upper reaches of the River Moy catchment ( Moy 030 - 174.78Km$^2$ ) which includes the area drained by the River Moy and all streams entering tidal water in Killala Bay between Benwee Head and Lenadoon Point, Co. Sligo, draining a total area of 2,345km². The largest urban centre in the catchment is Castlebar. The other main urban centres in this catchment are Ballina, Tubbercurry, Kiltimagh, Swinford, Foxford, Enniscrone and Crossmolina. The total population of the catchment is approximately 77,262 with a population density of 33 people per km². The lowland parts of the catchment are underlain by various types of limestones while the upland areas from the Ox Mountains and Croaghmoyle are underlain by a band of igneous and metamorphic rocks. Much of the lowland area south of Lough Conn exhibits drumlin type topography. There are also extensive sand and gravel aquifers lying between Swinford and Charlestown to as far south as Knock, to the east of Ballina and southwest of Crossmolina. More specifically the proposed site is located in the River Moy sub catchment Moy-SC-030 i.e. the Owengarve 030 sub basin.

The underlying geology is DSL (dinantian sandstone and shales) which contains a locally important (LI) of Low (L) vulnerability and a groundwater protection response R1. The principle soil group on site is AminPDPT which are acid mineral poorly drained surface water and ground water peaty gleys. The sub soil on site are TLPSsS, till derived chiefly from lower Paleozoic sand stone and shales, with variable texture and moderate permeability over lain by well drained soil The relative risk to both groundwater and surface water considered low for N, MRP and pathogens.

The entire site is within the River Moy SAC boundary however this is tempered by the fact that the on site habitat is described as GA1 (improve agricultural grassland) with no annexed habitats types present on the site or contiguous to the site boundary. The surrounding land use and habitat type also consists of improved agricultural grassland which is subject similar levels of agricultural activity

with a low density of dwellings and farm yard complexes.

There is no existing qualitative or quantitative data for ground water in the immediate area of the proposed development. The NRBMP indicate that the ground water status is “Good” and “Not at Risk” and not in a nutrient sensitive area or an Area for Action under the NRBMP. The near surface phosphate susceptibility is low with the near surface nitrate susceptibility considered moderate. Under the RBMP / WFD the surface water of the Owengarve River at this location is also considered to be of “High” status with an objective of “protect” and “not at risk” from abstraction, agriculture, domestic waste water treatment, aquaculture, forestry, urban run off, urban water discharges or hydro morphology.

The 2018 – 2021 River Basin Management plans Catchment assessment are not yet available and are currently being completed by the Environmental Protection Agency’s Catchment Science and Management Unit. On April 17th 2018 the Government published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will undertake to improve water quality and achieve ‘good’ ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027, which is an extension to the original time frames which were prescribed under the 1st cycle WFD targets and objectives. Ireland is required to produce a river basin management plan under the Water Framework Directive (WFD) which is the overarching legislation governing this approach. The Plan provides a more coordinated framework for improving the quality of waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland. The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are considered significant. A key purpose of the River Basin Management Plan (RBMP) is to set out priorities and to ensure that implementation is guided by those priorities, which detail the approach and infrastructural requirements. The key water quality data still originates in the first phase i.e. under the WFD data sets which have yet to be updated therefore the EPA Q values are more pertinent regarding empirical evidence when completing the AA process. Currently the RBMP is essentially a green paper on water quality which will require considerable capital investment from central government if the objectives are to be achieved within the prescribed time scales however to date no such commitment has being made.

This second-cycle River Basin management Plan 2018 – 2021 aims to build on the positive aspects of the first cycle WFD, and to acknowledge and address those aspects which did not achieve the prescribed or anticipated objectives and targets. The risk assessment is based on the monitoring data for the period 2007–2015, including data on status, water quality trends and the scale of the challenges involved in meeting the environmental targets set by the WFD. Where the monitoring data indicated that there was a risk that the environmental objectives would not be achieved in respect of certain water bodies, an assessment was then carried out to identify the significant pressures impacting on that water status. The River Basin Management Plan (RBMP) sets out a range of actions aimed at moving towards the objectives of the EU Water Framework Directive (WFD). In terms of devising a strategy for implementation, it must be acknowledged that the planned

actions are diverse, involve multiple stakeholders and will be implemented taking account of the available resources. Planned actions range from national measures implemented by national authorities (such as the Irish Water Capital Investment Plan and the Nitrates Action Programme) to sub-catchment management and water-body specific measures that need to be refined and implemented at a local level

This River Basin Management Plan (RBMP*)* sets out the measures aimed at protecting water bodies and addressing the pressures on those water bodies considered *"At Risk"* of not meeting the desired objectives of the Water Framework Directive (WFD). The approach adopted towards implementation centers on identifying and prioritising water bodies "for action" and ensuring effective delivery of environmental standards through a co-ordinated intervention at all levels. The River Basin Management Plan outlines the new approach that Ireland will take to protect our waters over the period to 2021. It builds on the experience from the first planning cycle in a number of areas:

(1) Stronger and more effective delivery structures have been put in place to build the foundations and momentum for long-term improvements to water quality

(2) A new governance structure, which brings the policy, technical and implementation actors together with public and representative organisations. This will ensure the effective and coordinated delivery of measures.

(3)The newly-established Local Authority Waters and Communities Office(link is external) will help people to get involved in improving water quality at a local level. An Fóram Uisce, also newly established, is a forum for stakeholders, community groups and sectoral representatives. It will analyse and raise awareness of water issues.

An enhanced evidence base has been developed to guide national policies and the targeting of local measures. Technical assessments of 4,829 water bodies have been carried out, examining their status (quality) and whether they are 'at risk' of not meeting status objectives in the future. Using this information, the Plan sets out national policies and regional prioritised measures to ensure the specific targets are achieved.

Among the main actions that will be taken through the Plan are:

(1) Improved waste water treatment: €1.7 billion in investment by Irish Water in over 250 waste water treatment projects between 2017 and 2021. This will help improve water quality and prevent deterioration of quality in targeted water bodies, including 'protected areas'.

(2) Conservation and leakage reduction: Irish Water will implement important measures to make water use more sustainable and efficient, reducing leakage in our water network from 45% of all water produced down to 37% by 2021, based on 2017 figures.

(3) Scientific assessments of water bodies and implementation of local measures by 43 new, specialist, local authority investigative assessment personnel: they will carry out scientific assessments of water bodies and lead on local implementation measures.

(4) A new collaborative Sustainability and Advisory Support Programme: this partnership between the State and the dairy industry, consisting of 30 Sustainability Advisers, will promote best farming practice in 190 areas chosen for action, for up to 5,000 farmers.

(5) Dairy Sustainability Initiative to help improve water quality: 18,000 dairy farmers to receive advice on sustainable farming practices in the 190 areas for action.

(6) The development of water and planning guidance for local authorities: this will help local authorities to consider the risks to water quality during planning and development decision-making.

(7) Extension of the Domestic Waste Water Treatment Systems grant scheme: the scheme will assist with the costs of septic tank remediation in High Status water areas.

(8) A Blue Dot Catchments Programme: the new programme will create a network of excellent river and lake areas. Agencies will work together to protect or restore excellent water quality in these water bodies.

(9) A new Community Water Development Fund: this will enable and support community water initiative

As the implementation of the RBMP, under the WFD, ramps up more resources are being allocated by the state for example in the 6th of November 2018 30 Agricultural Sustainability Advisors have being employed by the state to address the 50% of waters at risk of not meeting their ecological "Good" target by 2027 however this is not relevant to the proposed project. The EPA Q values are more pertinent regarding empirical evidence when completing the AA process which is ratified by the detailed conservation objectives which make specific reference to the Q values when considering potential impacts on species. Neither the surface water nor the ground water are in allocation that is considered an "Area for Action" under the NRBMP.

There is an EPA monitoring station down stream from the site on the Owengarve order 4 River at Station RS34O030150 ford S of Rathmagurry Ho. which has a Q linear value of 4 and a Q legend of "Good" when last sampled in 1993.

Neither the surface water nor the ground water are considered to be under pressure from abstraction, anthropogenic activity, aquaculture, domestic waste water, forestry or invasive species. The River Moy and its tributaries are not considered nutrient sensitive and is not used for drinking water abstraction. It is governed by the EC Salmonid River Regulation 1988, SI 293 (quality of

salmonid waters). The fresh water pearl muscle is not recorded in the system however the invasive Zebra muscle is present as are the North American mink.

. The air quality in the area is described as very good (zone D) which translates to the following, $SO_2$ 0-49µgM$^{-3}$ (1hr average), $NO_2$ 0-36 µgM$^{-3}$ (1hr average), $O_3$ 0-39 µgM$^{-3}$ (1hr average) and $PM_{10}$ 0-19 µgM$^{-3}$ (24hr average).

# 4 NATURA 2000 SITES

The Natura 2000 sites within 15Km of the proposed development are listed below (see appendix B map 2):

(1) River Moy SAC 002298

(2) Doocastle Turlough SAC 000492

(3) Cloonakillina Lough SAC 0001899

(4) Turloughmore SAC 000637

(5) Flughany Bog SAC 000497

(6) Templehouse & Cloonadeigha Lough SAC 000636

(7) Lough Hoe Bog SAC 00633

(8) Lough Nabrickkeagh Bog SAC 00634

(9) Ox Mountain Bog SAC002006

## 4.1 DESIGNATED SITES IN THE VICINITY OF THE PROJECT

There are a number of designated sites within 15km of the proposed development (see Map 1 in appendix) and these Natura sites are listed in Table T1 below.

**Table T1: Natura sites within 15km of the proposed development**

| Designation | Site Name | Site Code | Distance from the proposed development | Direction to Natura Site |
|---|---|---|---|---|
| SAC | River Moy | 002298 | Located within boundary of the SAC | N/A |
| SAC | Doocastle Turlough | 000492 | 8.455Km | North East |
| SAC | Cloonakillina Lough | 0001899 | 9.065Km | East |
| SAC | Turloughmore | 000637 | 7.756Km | North North East |
| SAC | Flughany Bog | 000497 | 11.12Km | East |
| SAC | Templehouse & Cloonadeigha Lough | 000636 | 12.993Km | North East |
| SAC | Lough Hoe Bog | 00633 | 12.209Km | North West |
| SAC | Lough Nabrickkeegh Bog | 000634 | 10.125Km | North West |
| SAC | Ox Mountain Bog | 002006 | 9.064Km | North West |

## 4.2 CHARACTERISTICS OF THE DESIGNATED SITES

The subsequent sections 4.2.1 to 4.2.9 outline the Site Synopsis and the features of interest as prescribed by the NPWS for each site individually. The detailed conservation objectives are included for the most relevant Natura sites. The site synopsis for each site has being generated by the NPWS, whom are the state body with the statutory responsibility for all Natura sites (SPA/SAC) and NHA's, and given their significance are presented in this report in an un-condensed format; free from editing, abbreviation, interpretation or summation. This ensures that there are no erroneous omissions from the site descriptions which facilitate, not just the competent authority, but also any other state body, public body or private individual in assessing each designated site considered on its own merit. The NHA's do not have a statutory designation. Protection of such areas is restricted to (1) REPS / AEOS/ GLAS plans which require conservation of NHA's and operate for a period of five years, (2) Forest service requirements for NPWS approval prior to payment of afforestation grants and (3) recognition of the ecological value of NHA's by planning and licensing authorities.

Only the conservation objectives for the most relevant sites are included in the following section. The conservation objectives and supporting documents for all Natura 2000 sites are publically available from NPWS on their web site if required.

### 4.2.1 Site Name: River Moy SAC

**SITE SYNOPSIS** Version date: 6.01.2014

**SITE CODE: 002298**

This site comprises almost the entire freshwater element of the 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 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 candidate SAC selected for alluvial wet woodlands and raised bog, both priority habitats on Annex I of the E.U. Habitats Directive. The site is also a candidate SAC selected for old oak woodlands, degraded raised bog and Rhynchosporion, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive -Atlantic Salmon, Otter, Sea and Brook Lamprey and White-clawed Crayfish.

On the slopes and rising ground around the southern shores of Loughs Conn and Cullin, Oak woodlands are seen. Sessile Oak *(Quercus petraea)* is the dominant tree with an understorey of Holly *(Ilex aquifolium),* Hazel *(Corylus avellana)* and Birch *(Betida pubescens}* with some Ash *(Fraxinus excelsior).* Additional species are associated with the lakeshore such as the whitebeam *(Sorbus rupicola},* Aspen *(Populus tremida),* Silver Birch *(B. pendula)* and the shrubs Guelder Rose *(Viburnum opidus),* Buckthorn *(Rhamnus catharticus)* and Spindle Tree *(Euonymus europaeus).* The ground flora is usually composed of Bilberry *(Vaccinium myrtillus),* Wood Rush *(Luzula syivatica),* Wood Sorrel *(Oxalis acetosella),* Buckler Ferns *(Dryopteris aemula* and *D. dilatatd),* Hard Fern *(Blechnum spicant),* Cow-wheat *(Melampyrum* spp.) and Bracken *(Pteridium aqu'dinum).* The rare Narrow-leaved Helleborine *(Cephalanthera longifolid),* protected under the Flora Protection Order, 1999, occurs in association with the woodlands. Also found in these woodlands is the snail *(Acanthinula lamellata).* associated with old natural woodlands. 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 cordatd).* 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 possesses 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 *(Narthecium ossifragum)* 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 *(Eriophorutn angust(folium),* Great Sundew *(Drosera anglica)* and occasional Lesser Bladderwort *(Utricularia minor).* Several of the hummock-forrning mosses *(Sphagnum fuscurn* and 5. *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 is dominated by White Beaked-sedge *(Rhynchospora alba)* comprise the habitat Rhynchosporion. Associated species in this habitat at the site include Bog Asphodel, Sundews, Deergrass *(Scirpus Scespitosus)* 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 by the Moy arterial drainage. Species typical of the active raised bog habitat are still present but the relative abundance of them is different. 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 Ling 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. 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. Arctic Charr *(Salvelinus alpinus)* appear to have disappeared from the lake over the same period of time. The changes in Lough Conn appear to represent an early phase in the eutrification process. Stoneworts still present include *Chara aspera, C. delicatula* and *Nilella* cf. *opaca.* Other plants found in the shallower portions are the pondweeds. 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 60s 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 officinal is)* and the north-western edge of the spectrum and possesses 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 *(Narthecium ossifragum)* 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 *(Eriophorutn angust(folium),* Great Sundew *(Drosera anglica)* and occasional Lesser Bladderwort *(Utricularia minor).* Several of the hummock-forrning mosses *(Sphagnum fuscurn* and 5. *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 is dominated by White Beaked-sedge *(Rhynchospora alba)* comprise the habitat Rhynchosporion. 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 by the Moy arterial drainage. Species typical of the active raised bog habitat are still present but the relative abundance of them is different. 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 Ling 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. 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. Arctic Charr *(Salvelinus alpinus)* appear to have disappeared from the lake over the same period of time. The changes in Lough Conn appear to represent an early phase in the eutrification process. Stoneworts still present include *Chara aspera, C. delicatula* and *Nilella* cf. *opaca.* Other plants found in the shallower portions are the pondweeds. 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 60s 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 officinal is)* and Loughs Conn and Cullin support important concentrations of wintering waterfowl and both are designated Special Protection Areas. A nationally important population of the Annex I species Greenland White-fronted Geese (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 landuse along the Moy. Much of the grassland is unimproved but improved grassland and silage 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 a 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 occurs. Sedimentation can cover the gravel beds resulting in a loss of suitable spawning grounds. The Moy has been arterially dredged in the 60s. 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 EU 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 broad-leaved 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.

## Threats and Vulnerabilities

| Negative Impacts | | | |
|---|---|---|---|
| Rank | Threats and pressures [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| M | A03 | | o |
| M | F03.01 | | i |
| M | A04 | | i |
| M | A08 | | i |
| M | B | | o |
| L | J01 | | i |
| M | I01 | | i |
| M | A04 | | o |
| M | E01.03 | | o |
| H | F02.03 | | i |
| L | C01.03 | | i |
| M | B | | i |
| M | E01 | | o |
| M | A08 | | o |
| M | A03 | | i |

| Positive Impacts | | | |
|---|---|---|---|
| Rank | Activities, management [code] | Pollution (optional) [code] | inside/outside [i\|o\|b] |
| H | F02.03 | | i |
| M | F03.01 | | i |

**Other Site Characteristics**

This site comprises almost the entire freshwater element of the Moy and its tributaries, including both Lough Conn and Lough Cullin. The system drains a catchment area of 805 km2. Most of the site is in Co. Mayo though parts are in west Sligo and north Roscommon. 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. The river and its various tributaries rise in a number of locations some of which are upland areas dominated by blanket bog and heath. Throughout most of its course however the river flows through low-lying countryside where most of the adjoining land consists of agricultural grassland. The river eventually reaches the sea at Ballina where it flows into Killala Bay. To the west of Lough Cullin the river passes through areas where the bedrock is dominated by silicious rocks such as granite and here the character of the adjoining land changes to one where blanket bog and heath are important components of the landscape. In addition to river and lake habitats, the site contains adjoining habitats of ecological interest such as raised bogs, heath, wet grassland and deciduous woodland. Small pockets of conifer plantations, close to the lakes and along parts of the rivers, are included. Improved grassland is also included where it occurs along the river channels.

**Quality and importance**

This extensive site contains good examples of the Annex 1 habitats active raised bog, degraded raised bog, Rhynchosporion vegetation, alkaline fen, alluvial woodland and old oak woodlands. The raised bog areas present constitute the most north-westerly examples of raised bog in Ireland, with the most important examples occurring at Derrynabrock and Tawnaghbeg. Alkaline fen is particularly well developed at Mannin and Island Lakes, an excellent example of old oak woodland is to be found just east of Pontoon along the shores of Loughs Conn and Cullin. This represents one of the largest stands of oak woodland in western Ireland. Water quality of the river channels is generally good and the majority is classified as unpolluted. The open waters of Loughs Conn and Cullin are moderately hard with relatively low colour and good transparency. Lough Conn, with a surface of 50km2, is classified as a mesotrophic system, while Lough Cullin (surface of 11 km2) is classified as an oligotrophic system. The rivers and lakes support important populations of Lutra lutra, Austropotamobius pallipes, Lampetra planeri and Petromyzon marinus. The Moy system is one of the most important in Ireland for Salmo salar and is an internationally renowned fishery. It also has important stocks of Salmo trutta. Lough Conn supports a nationally important population of Anser albifrons flavirostris and has regionally important numbers of Cygnus cynus and Pluvialis apricaria (all Annex I Bird Directive species). The lakes support a range of other wintering waterfowl, notably nationally important populations of Aythya fuligula and Bucephala clangula. Lough Conn / Cullin represents one of only 4 breeding sites in Ireland for Melanitta nigra, which in Ireland is at the south-west end of its European range The population, however, has seriously declined

in recent years. A range of mammals listed in the Red Data Book occur within the site, including Martes martes and Myotis daubentoni. At least five Red Data Book plant species occur, including Cephalanthera longifolia and Spiranthes romanzoffiana.

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# National Parks and Wildlife Service

## *Conservation Objectives Series*

## River Moy SAC 002298

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

## 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*

| 002298 | River Moy SAC |
|---|---|
| 1092 | White-clawed Crayfish *Austropotamobius pallipes* |
| 1095 | Sea Lamprey *Petromyzon marinus* |
| 1096 | Brook Lamprey *Lampetra planeri* |
| 1106 | Salmon *Salmo salar* |
| 1355 | Otter *Lutra lutra* |
| 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)* |

**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.**

## Supporting documents, relevant reports & publications

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

### NPWS Documents

| | |
|---|---|
| **Year :** | 1998 |
| **Title :** | Conservation management of the white-clawed crayfish, (*Austropotamobius pallipes*) |
| **Author :** | Reynolds, J.D. |
| **Series :** | Irish Wildlife Manual No. 1 |
| **Year :** | 2004 |
| **Title :** | The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs |
| **Author :** | King, J.J.; Linnane, S.M. |
| **Series :** | Irish Wildlife Manuals No. 14 |
| **Year :** | 2004 |
| **Title :** | A survey of juvenile lamprey populations in the Moy catchment |
| **Author :** | O'Connor, W. |
| **Series :** | Irish Wildlife Manuals No. 15 |
| **Year :** | 2006 |
| **Title :** | Otter survey of Ireland 2004/2005 |
| **Author :** | Bailey, M.; Rochford, J. |
| **Series :** | Irish Wildlife Manual No. 23 |
| **Year :** | 2006 |
| **Title :** | Assessment of impacts of turf cutting on designated raised bogs |
| **Author :** | Fernandez Valverde, F.; MacGowan, F.; Farrell, M.; Crowley, W.; Croal, Y.; Fanning, M.; McKee, A-M. |
| **Series :** | Unpublished report to NPWS |
| **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 Manual No. 46 |
| **Year :** | 2010 |
| **Title :** | A technical manual for monitoring white-clawed crayfish (*Austropotamobius pallipes*) in Irish lakes |
| **Author :** | Reynolds, J., O'Connor, W., O'Keeffe, C.; Lynn, D. |
| **Series :** | Irish Wildlife Manual No.45 |
| **Year :** | 2012 |
| **Title :** | Killala Bay/Moy Estuary SAC (00458) Coastal Supporting doc V1 |
| **Author :** | NPWS |
| **Series :** | Conservation objectives supporting document |

| | |
|---|---|
| **Year :** | 2012 |
| **Title :** | Killala Bay/Moy Estuary SAC (000458) Marine supporting doc v.1 |
| **Author :** | NPWS |
| **Series :** | Conservation objectives supporting document |
| **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 Manual No. 76 |
| **Year :** | 2014 |
| **Title :** | Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0 |
| **Author :** | Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B. |
| **Series :** | Irish Wildlife Manual No. 79 |
| **Year :** | 2014 |
| **Title :** | Raised Bog Monitoring and Assessment Survey 2013 |
| **Author :** | Fernandez, F.; Connolly K.; Crowley W.; Denyer J.; Duff K.; Smith G. |
| **Series :** | Irish Wildlife Manual No. 81 |
| **Year :** | 2014 |
| **Title :** | National raised bog SAC management plan |
| **Author :** | Department of Arts, Heritage and the Gaeltacht |
| **Series :** | Draft for consultation. 15 January 2014 |
| **Year :** | 2014 |
| **Title :** | Derrynabrock Bog (SAC 002298), Co.Roscommon/Mayo, Site Report |
| **Author :** | Fernandez, F.; Connolly, K.; Crowley, W.; Denyer J.; Duff K.; Smith G. |
| **Series :** | Raised bog monitoring and assessment survey 2013 |
| **Year :** | 2014 |
| **Title :** | Tawnaghbeg Bog (SAC 002298), Co. Mayo, Site Report |
| **Author :** | Fernandez, F.; Connolly, K.; Crowley, W.; Denyer J.; Duff K.; Smith G. |
| **Series :** | Raised bog monitoring and assessment survey 2013 |
| **Year :** | 2016 |
| **Title :** | River Moy SAC (site code: 2298) Conservation objectives supporting document- raised bog habitats V1 |
| **Author :** | NPWS |
| **Series :** | Conservation objectives supporting document |


## Other References


| | |
|---|---|
| **Year :** | 1982 |
| **Title :** | Otter survey of Ireland |
| **Author :** | Chapman, P.J.; Chapman, L.L. |
| **Series :** | Unpublished report to Vincent Wildlife Trust |
| **Year :** | 2002 |
| **Title :** | Reversing the habitat fragmentation of British woodlands |
| **Author :** | Peterken, G. |
| **Series :** | WWF-UK, London |

| | |
|---|---|
| **Year :** | 2003 |
| **Title :** | Monitoring the river, sea and brook lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus* |
| **Author :** | Harvey, J.; Cowx, I. |
| **Series :** | Conserving Natura 2000 Rivers Monitoring Series No. 5. English Nature, Peterborough |
| **Year :** | 2003 |
| **Title :** | Identifying lamprey. A field key for sea, river and brook lamprey |
| **Author :** | Gardiner, R. |
| **Series :** | Conserving Natura 2000 rivers, Conservation techniques No. 4. English Nature, Peterborough |
| **Year :** | 2007 |
| **Title :** | Evolutionary history of lamprey paired species *Lampetra fluviatilis* L. and *Lampetra planeri* Bloch as inferred from mitochondrial DNA variation |
| **Author :** | Espanhol, R.; Almeida, P.R.; Alves, M.J. |
| **Series :** | Molecular Ecology 16, 1909-1924 |
| **Year :** | 2010 |
| **Title :** | Otter tracking study of Roaringwater Bay |
| **Author :** | De Jongh, A.; O'Neill, L. |
| **Series :** | Unpublished draft report to NPWS |
| **Year :** | 2015 |
| **Title :** | Behaviour of sea lamprey (*Petromyzon marinus* L.) at man-made obstacles during upriver spawning migration: use of telemetry to access efficacy of weir modifications for improved passage |
| **Author :** | Rooney, S.M.; Wightman, G.D.; O Conchuir, R.; King, J.J. |
| **Series :** | Biology and Environment: Proc. R. Ir. Acad. 115 B, 1-12 |
| **Year :** | 2015 |
| **Title :** | River engineering works and lamprey ammocoetes; impacts, recovery, mitigation |
| **Author :** | King, J.J.; Wightman, G.D.; Hanna, G.; Gilligan, N. |
| **Series :** | Water and Environment Journal, 29, 482-488 |
| **Year :** | 2016 |
| **Title :** | The status of Irish salmon stocks in 2015 with precautionary catch advice for 2016 |
| **Author :** | Standing Scientific Committee on Salmon |
| **Series :** | Independent scientific report to Inland Fisheries Ireland |

## Spatial data sources

| | |
|---|---|
| **Year :** | 2014 |
| **Title :** | Scientific Basis for Raised Bog Conservation in Ireland |
| **GIS Operations :** | RBSB13_SACs_ARB_DRB dataset, RBSB13_SACs_2012_HB dataset, RBSB13_SACs_DrainagePatterns_5k dataset and RBSB13_SAC_LIDAR_DTMs dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising |
| **Used For :** | Potential 7110; digital elevation model; drainage patterns (maps 3 and 5) |
| **Year :** | 2013 |
| **Title :** | Raised Bog Monitoring and Assessment Survey 2013 |
| **GIS Operations :** | RBMA13_ecotope_map dataset clipped to SAC boundary. Appropriate ecotopes selected and exported to new dataset. Expert opinion used as necessary to resolve any issues arising |
| **Used For :** | 7110 ecotopes (map 4) |
| **Year :** | Digitised 2003 |
| **Title :** | Raised Bog Restoration Project 1999 |
| **GIS Operations :** | Ecotope dataset clipped to SAC boundary. Appropriate ecotopes selected and exported to new dataset. Expert opinion used as necessary to resolve any issues arising |
| **Used For :** | 7110 ecotopes (map 4) |
| **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 :** | 91A0, 91E0 (map 6) |
| **Year :** | 2005 |
| **Title :** | OSi Discovery series vector data |
| **GIS Operations :** | Creation of a 10m buffer on the terrestrial side of river banks data; creation of 20m buffer applied to canal centreline data. Creation of a 20m buffer applied to river and stream centreline data; These datasets combined with the derived OSI 1:5000 vector lake buffer data. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising |
| **Used For :** | 1355 (no map) |
| **Year :** | 2010 |
| **Title :** | OSi 1:5000 IG vector dataset |
| **GIS Operations :** | Creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets combined with the derived OSi Discovery Series river and canal datasets. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising. Creation of 250m buffer on aquatic side of the lake boundary to highlight potential commuting points |
| **Used For :** | 1355 (map 8) |
| **Year :** | 2016 |
| **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 :** | 1092 (map 7) |

## 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**

| Attribute | Measure | Target | Notes |
|---|---|---|---|

| 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**

| Attribute | Measure | Target | Notes |
|---|---|---|---|

## 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:**

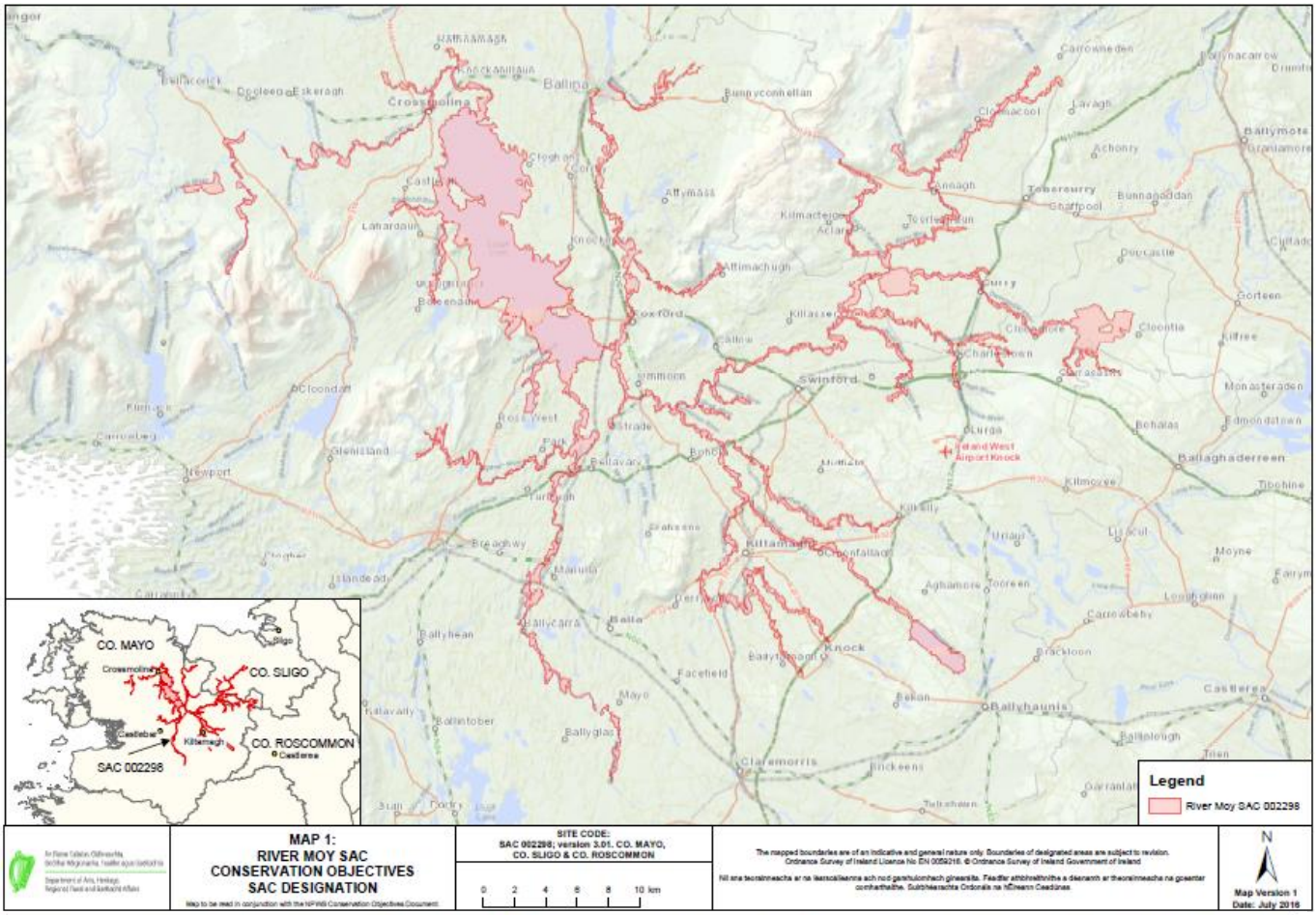
| Attribute | Measure | Target | Notes |
|---|---|---|---|
| Distribution: extent of anadromy | Percentage of river accessible | 100% of river channels down to second order accessible from estuary | Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and 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) |

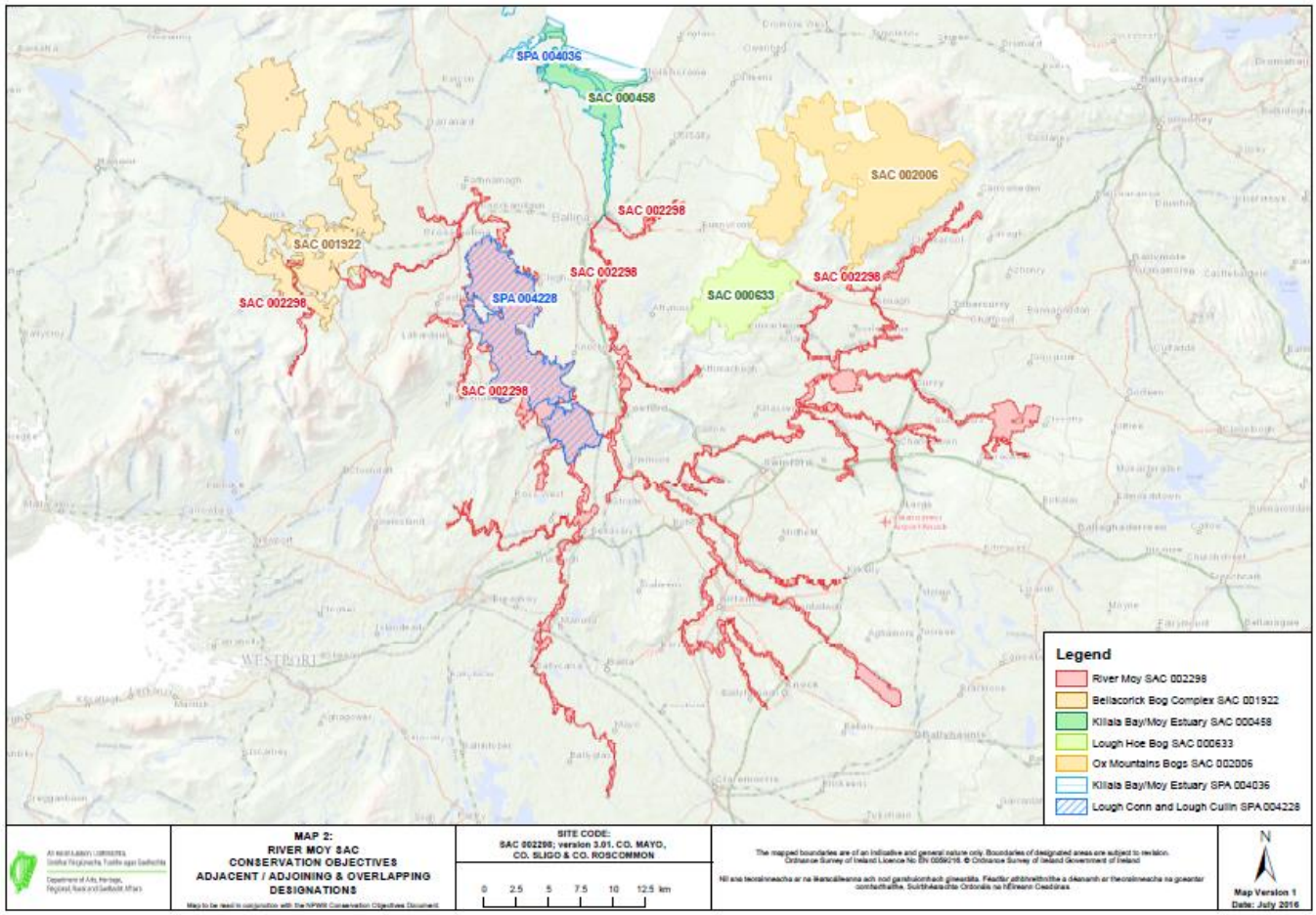
## Conservation Objectives for : River Moy SAC [002298]

**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 |


CO. MAYO
CO. SLIGO
CO. ROSCOMMON
SAC 002298
Legend
River Moy SAC 002298
MAP 1:
RIVER MOY SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
0 2 4 6 8 10 km
Map Version 1
Date: July 2016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SAC 002006
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SAC 001922
SAC 002298
SAC 002298
SPA 004228
SAC 000633
SAC 002298
SAC 002298
Legend
River Moy SAC 002298
Bellacorick Bog Complex SAC 001922
Killala Bay/Moy Estuary SAC 000458
Lough Hoe Bog SAC 000633
Ox Mountains Bogs SAC 002006
Killala Bay/Moy Estuary SPA 004036
Lough Conn and Lough Cullin SPA 004228
MAP 2:
RIVER MOY SAC
CONSERVATION OBJECTIVES
ADJACENT / ADJOINING & OVERLAPPING
DESIGNATIONS
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
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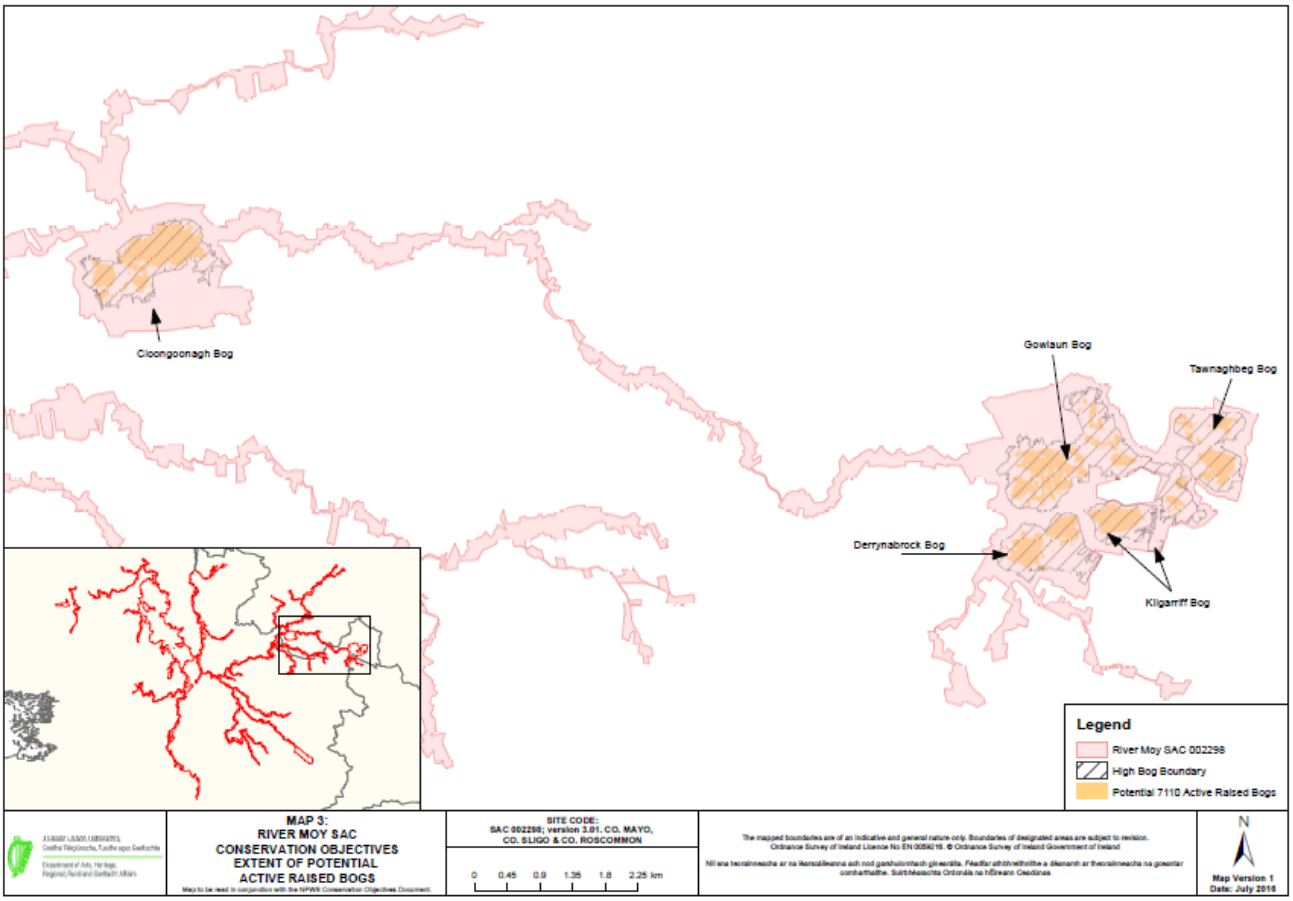
Map Version 1
Date: July 2016


Cloongoonagh Bog
Gowlaun Bog
Tawnaghbeg Bog
Derrynabrock Bog
Kilgarriff Bog
Legend
River Moy SAC 002298
High Bog Boundary
Potential 7110 Active Raised Bogs
MAP 3:
RIVER MOY SAC
CONSERVATION OBJECTIVES
EXTENT OF POTENTIAL
ACTIVE RAISED BOGS
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
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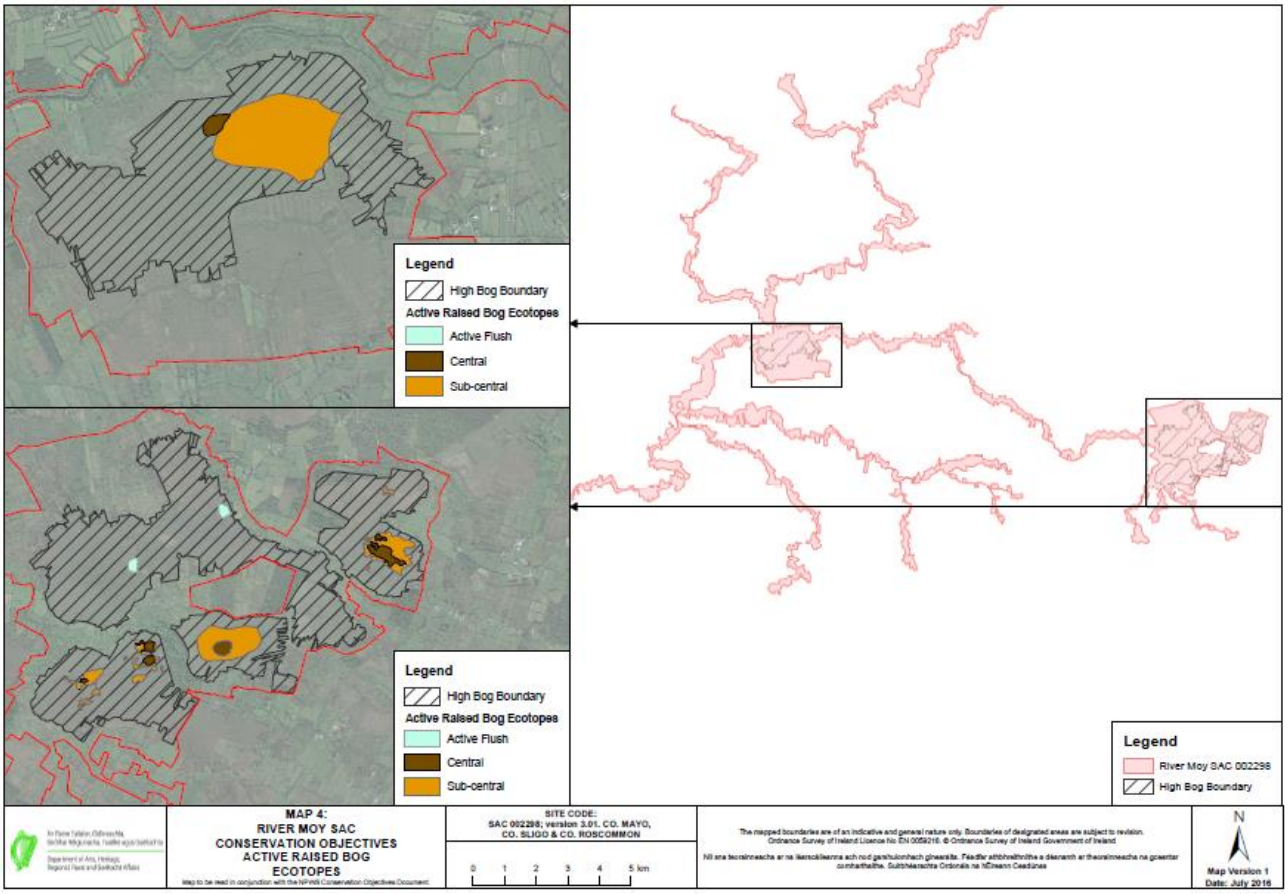
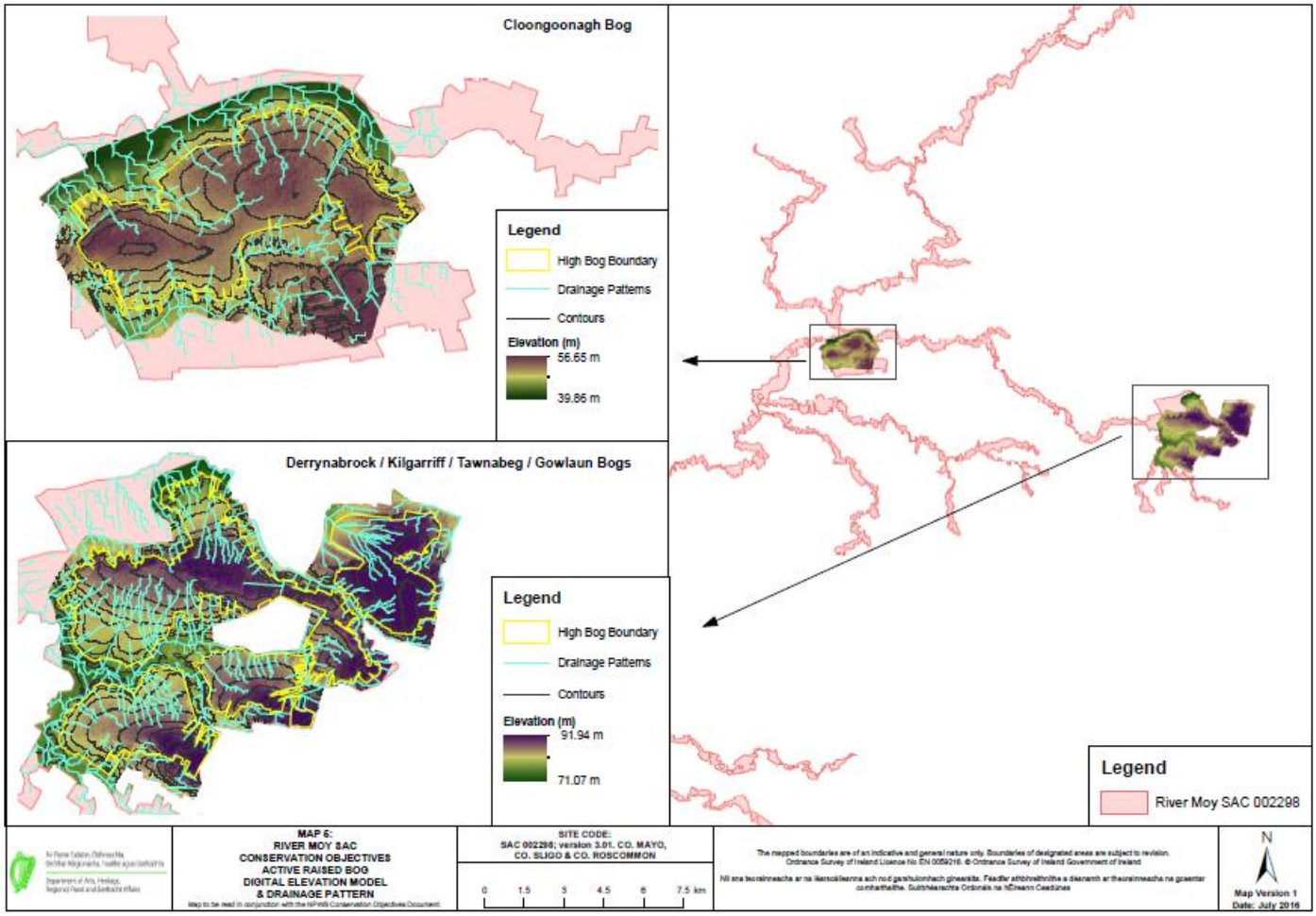
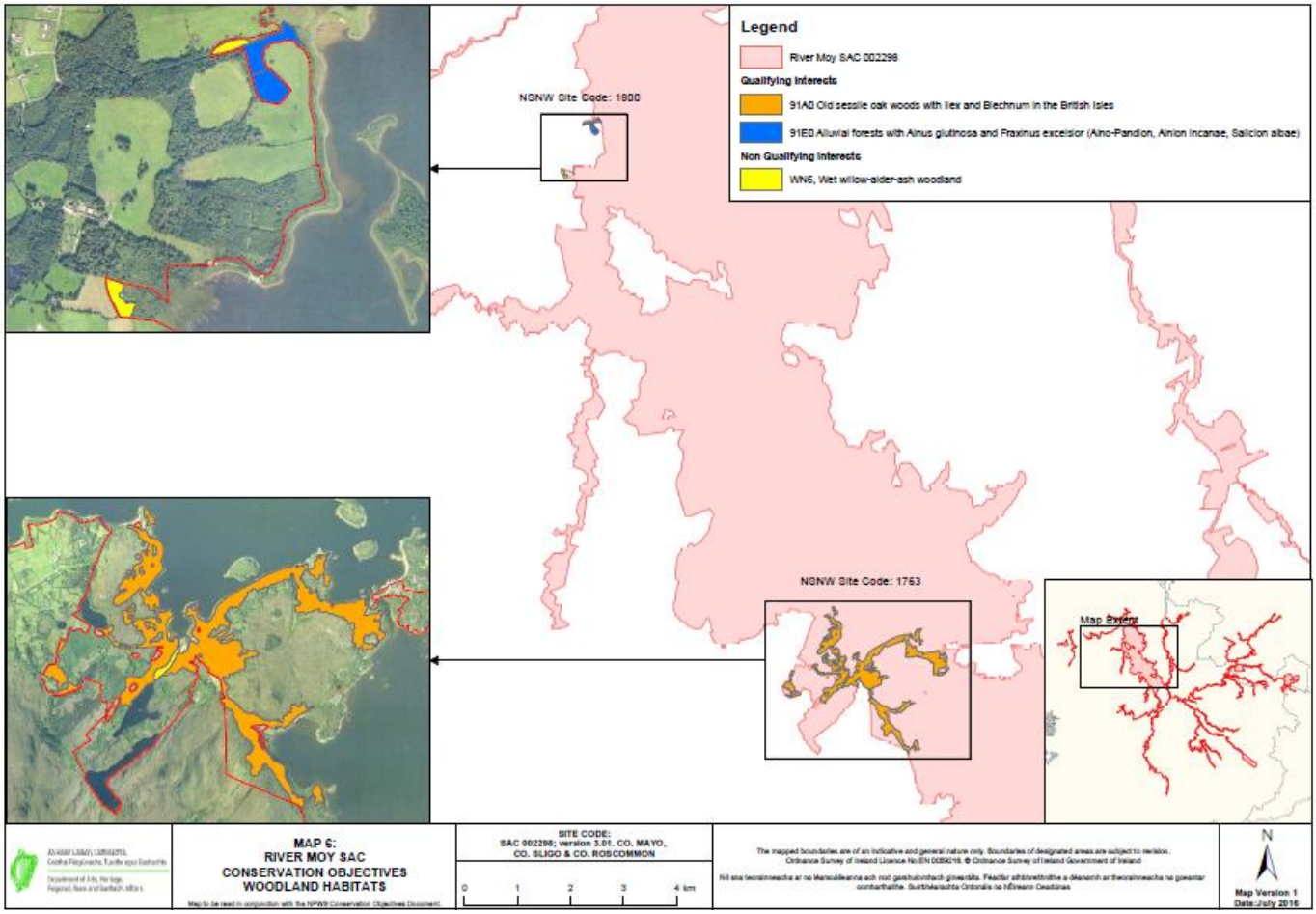
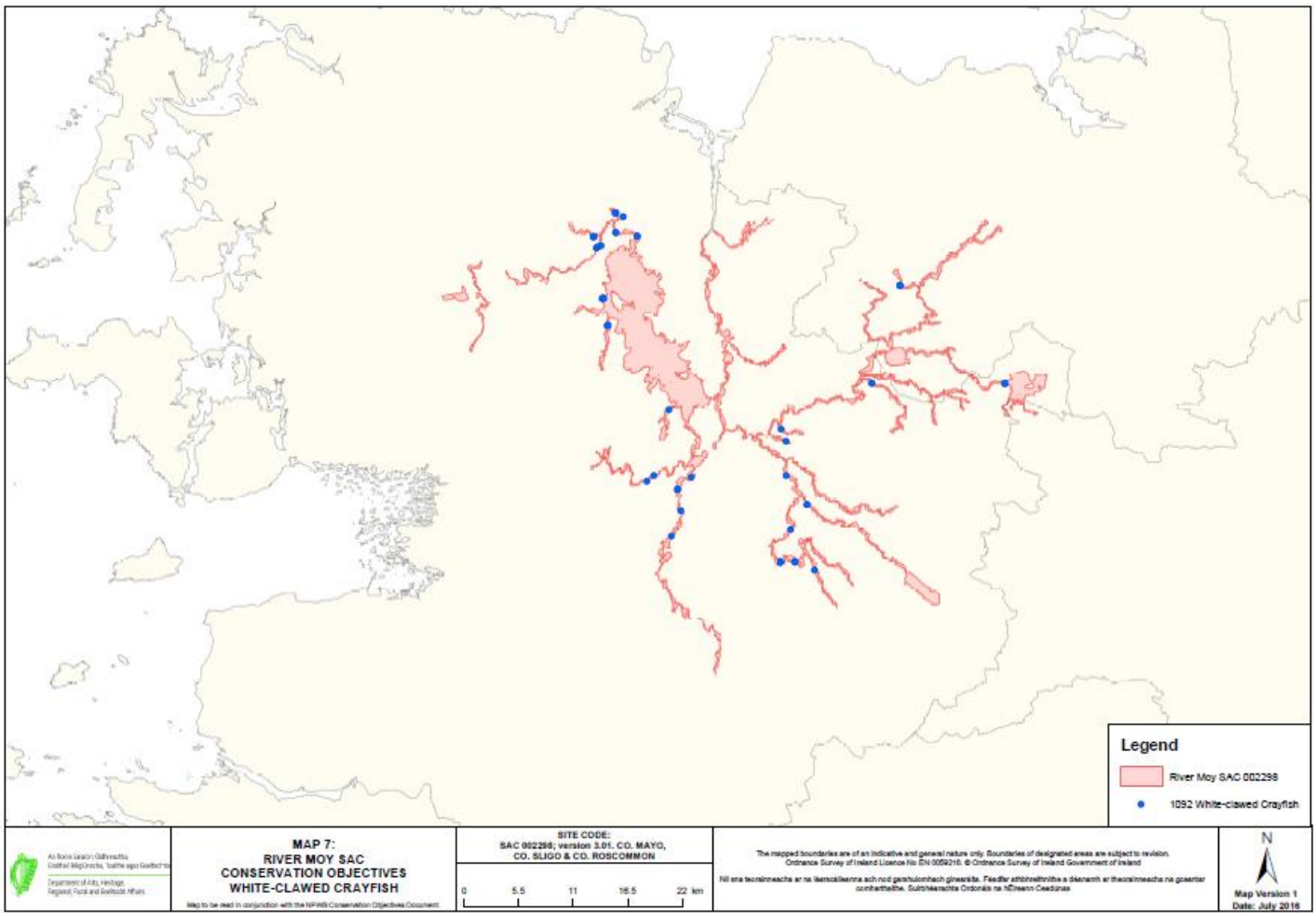
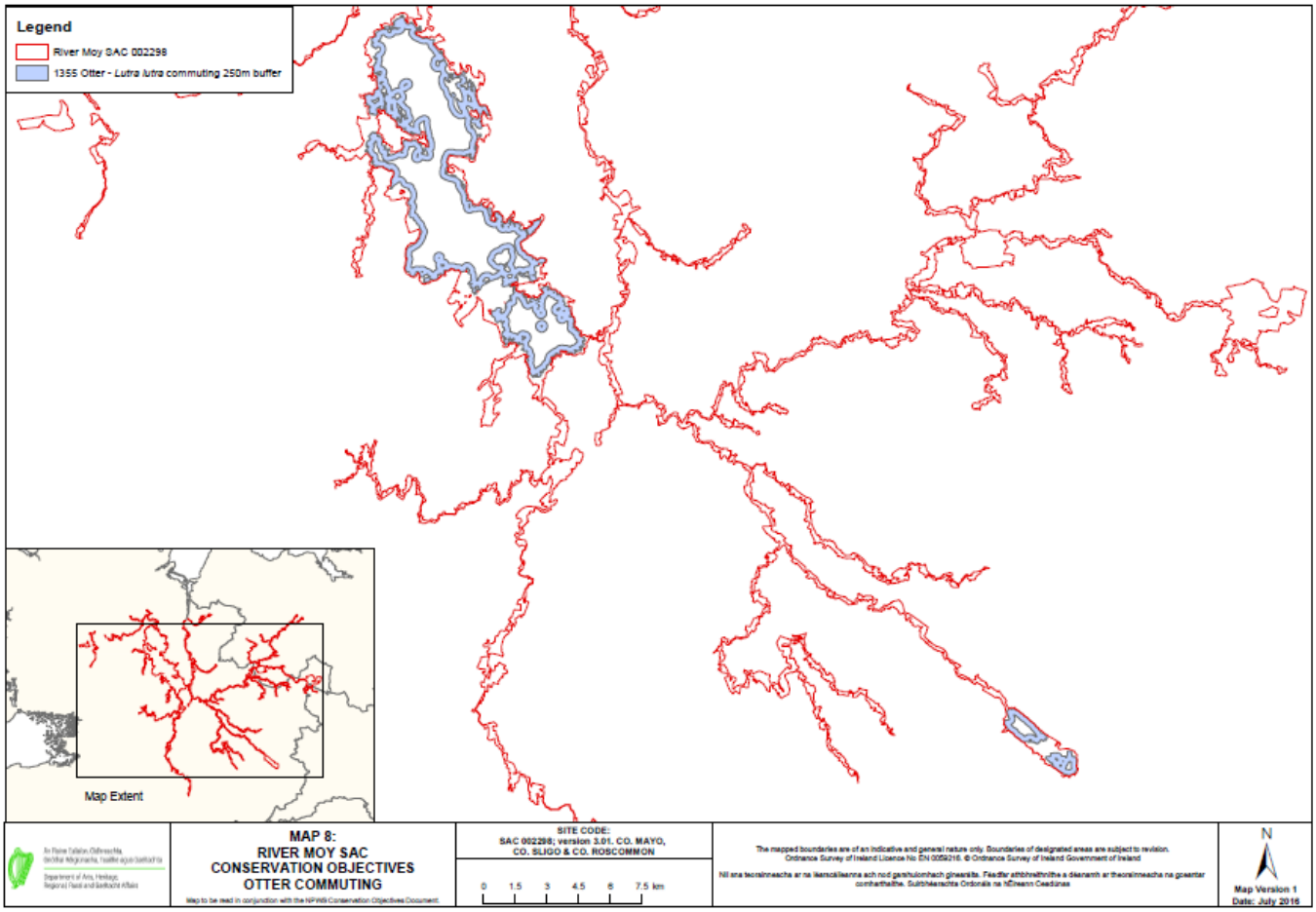
N
Map Version 1
Date: July 2016


Legend
High Bog Boundary
Active Raised Bog Ecotopes
Active Flush
Central
Sub-central
Legend
High Bog Boundary
Active Raised Bog Ecotopes
Active Flush
Central
Sub-central
Legend
River Moy SAC 002298
High Bog Boundary
MAP 4:
RIVER MOY SAC
CONSERVATION OBJECTIVES
ACTIVE RAISED BOG
ECOTOPES
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
0 1 2 3 4 5 km
N
Map Version 1
Date: July 2016


Cloongoonagh Bog
Legend
High Bog Boundary
Drainage Patterns
Contours
Elevation (m)
56.65 m
39.86 m
Derrynabrock / Kilgarriff / Tawnabeg / Gowlaun Bogs
Legend
High Bog Boundary
Drainage Patterns
Contours
Elevation (m)
91.94 m
71.07 m
Legend
River Moy SAC 002298
MAP 6:
RIVER MOY SAC
CONSERVATION OBJECTIVES
ACTIVE RAISED BOG
DIGITAL ELEVATION MODEL
& DRAINAGE PATTERN
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
0 1.5 3 4.5 6 7.5 km
N
Map Version 1
Date: July 2016


Legend
River Moy SAC 002298
Qualifying Interests
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)
Non Qualifying Interests
WN6, Wet willow-alder-ash woodland
NSNW Site Code: 1800
NSNW Site Code: 1763
Map Extent
MAP 6:
RIVER MOY SAC
CONSERVATION OBJECTIVES
WOODLAND HABITATS
SITE CODE:
SAC 002298; version 3.01. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
0 1 2 3 4 km
N
Map Version 1
Date: July 2016


Legend
River Moy SAC 002298
1092 White-clawed Crayfish
MAP 7:
RIVER MOY SAC
CONSERVATION OBJECTIVES
WHITE-CLAWED CRAYFISH
SITE CODE:
SAC 002298; version 3.0 f. CO. MAYO,
CO. SLIGO & CO. ROSCOMMON
0 5.5 11 16.5 22 km
N
Map Version 1
Date: July 2016




**4.2.2 Site Name: Doocastle Turlough SAC**

**SITE SYNOPSIS Version date: 26.08.2013**

**Site Code: 000492**

Doocastle turlough occurs on the county boundary between Mayo and Sligo, south-east of Tobercurry. Its basin is orientated along a north-west/south-east axis on gently undulating fluvioglacial deposits, with little exposed rock visible. The turlough is marl-free and in this regard resembles the nearby Turloughmore and Moylough, as well as Castleplunket and Carrowreagh in Roscommon. 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):

[3180] Turloughs*

The wettest parts of the turlough are the ditches and two shallow ponds extending from them. Water Horsetail (*Equisetum fluviatile*) occurs in the ditches, with Unbranched Bur-reed (*Sparganium emersum*), Branched Bur-reed (*S. erectum*), Water-plantain (*Alisma plantago-aquatica*) and pondweeds (*Potamogeton natans*. *P. pusillus* and *P. crispus*). The pools contain Water-pepper (*Polygonum hydropiper*) and Small Water-pepper (*P. minus*), mixed with Floating Sweet-grass (*Glyceria fluitans*), Thread-leaved Water-crowfoot (*Ranunculus*

*trichophyllus*), Lesser Marshwort (*Apium inundatum*) and Marsh Yellow-cress (*Rorippa palustris*). The uncommon Marsh Stitchwort (*Stellaria palustris*) grows adjacent to some of the ditches at the western end. A small intermittent stream flows into the turlough from the eastern end but in the summer the stream sinks and is no longer visible. There is no evidence of any external drainage, but additional seepage comes from a willow (*Salix* sp.) bed on the southern end of the basin. The floor of the basin is generally covered in a wet sedge community, including Carnation Sedge (*Carex panicea*), Common Sedge (*C. nigra*), Reed Canary-grass (*Phalaris arundinacea*), Marsh Pennywort (*Hydrocotyle vulgaris*) and Marsh-marigold (*Caltha palustris*), with Marsh Cinquefoil (*Potentilla palustris*) and Amphibious Bistort (*Polygonum amphibium*) in the wetter areas. The uncommon Fen Bedstraw (*Galium uliginosum*) also occurs here. East of the castle the vegetation is dominated by taller herbs such as Meadowsweet (*Filipendula ulmaria*), Brown Sedge (*Carex disticha*) and Bottle Sedge (*C. rostrata*). The Summer Snowflake (*Leucojum aestivum*) occurs as a few clumps on the floor of this basin but it has probably been introduced. Doocastle contains small numbers of Whooper Swan and Golden Plover, species listed on Annex I of the E.U. Birds Directive. Other migratory wildfowl and waders occur in quite high numbers for a relatively isolated turlough (numbers are individuals recorded in 1993) - Wigeon (289), Teal (142), Curlew (92) and Lapwing (125). In summary, this site is the best developed of the three most northerly turloughs in the country, with a good diversity of vegetation and several plants uncommon to the locality. There is some nutrient-poor fen with Fen Bedstraw, its only station in east Mayo. The turlough is relatively intact and no arterial or other drainage has been carried out. The site is also important for its bird populations.

**4.2.3 Site Name: Cloonakillina Lough SAC**
**SITE SYNOPSIS Version date: 14.11.2013**
**Site Code: 001899**

Cloonakillina is a medium sized lake located in Co. Roscommon, 10 km south-east of Tobercurry which is in Co. Mayo. More than half the area of the original lake has now developed into an extensive area of scraw (floating vegetation) or transition mire. 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):

[7140] Transition Mires

With the exception of a few areas of open water, the floating mat of vegetation covers the entire western half of Cloonakillina Lough. It is comprised mainly of sedges (*Carex* sp.), reedbeds and Bogbean (*Menyanthes trifoliata*). The sedge communities are diverse and include Slender Sedge (*Carex lasiocarpa*), Slender Tufted-sedge (*C. acuta*), Lesser Tussock-sedge (*C. diandra*), Long-stalked Yellow-sedge (*C. lepidocarpa*) Bottle Sedge (*C. rostrata*), Greater Tussock-sedge (*C. paniculata*) and Bog Sedge (*C. limosa*). There is also an excellent diversity of tall herbs such as Yellow Loosestrife (*Lysimachia vulgaris*) and Purple Loosestrife (*Lythrum salicaria*). Rafts of Common Club-rush (*Scirpus lacustris*) occur

in shallower areas around the lake and adjacent to islands within the lake. The islands support stands of broadleaf deciduous woodland adding diversity to the site. The interior of the site is used for feeding and roosting by small numbers of wildfowl such as Mallard, Teal and Wigeon. Redshank, Curlew, Snipe, Common Sandpiper, Mute Swan and Dunlin are also known to frequent the site. The margins of the site are used for cattle grazing and other agricultural purposes. There is also a large mature conifer plantation on the north-west and south-west sides which makes this end of the lake quite inaccessible and provides additional cover for birdlife on the lake. This lake has undergone rapid succession from open water to transition mire since it was first mapped in 1915. This change was probably initiated and accelerated by drainage in the region, but nonetheless the rate of change is quite exceptional. This site is unique in character and is of high conservation significance because of its considerable size and botanical diversity. It is also an excellent ecological example of one of the successional pathways from open water to raised bog formation.

**4.2.4 Site Name: Turloughmore (Sligo) SAC**
**SITE SYNOPSIS Version date: 10.09.2013**
**Site Code: 000637**

Turloughmore occupies a hollow in the drift-covered ridges north-east of Tobercurry in Co. Sligo. It is less calcareous than most turloughs and is also relatively free-draining, resulting in the fact that there are no long-lasting pools left when groundwater levels subside. The reason for this seems to be the sandy glacial drift which fills the basin. This is derived from the acidic rocks to the north, rather than the limestones to the south-east. The drift gives a smooth outline to the turlough and there is only a single small outcrop of rock. A raised bog encroaches from the east, which creates an unusual zonation on this side. Pasture, some of which floods at times of very high water levels, surrounds the remainder of the turlough.
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):

[3180] Turloughs*

The turlough consists of two parts, separated by a slight ridge. The vegetation of both basins is a predominantly dry grass and sedge community. Species present on the floor include a range of sedges (*Carex nigra, C. hirta* and scattered *C. disticha*), with Tall Fescue (*Festuca arundinacea*), Reed Canary-grass (*Phalaris arundinacea*) and Marsh Ragwort (*Senecio aquaticus*). Above this level, there is an extensive area of slightly leached heath-type vegetation, with Mat-grass (*Nardus stricta*), Tufted Hair-grass (*Deschampsia cespitosa*) and Carnation Sedge (*Carex panicea*). Tormentil (*Potentilla erecta*) is abundant, and a little Creeping Cinquefoil (*P. reptans*) is present, with lady's-mantle (*Alchemilla* sp.), Common Spotted-orchid (*Dactylorhiza fuchsii*) and, on the eastern side below the bog, Sneezewort (*Achillea ptarmica*), the eyebright *Euphrasia arctica* and Heath Rush (*Juncus squarrosus*). Above this zone there is often a band of Purple Moor-grass (*Molinia caerulea*), rushes (*Juncus effusus* and *J. conglomeratus*), Devil's-bit Scabious (*Succisa pratensis*) and Sweet

Vernal-grass (*Anthoxanthum odoratum*).
The site is visited occasionally by small numbers of Whooper Swan, a species listed on Annex I of the E.U. Birds Directive.
The turlough has a regular flooding pattern in winter and appears to be unaffected by local or regional drainage. The more oligotrophic communities at this site would be threatened by agricultural improvement to the areas around the turlough. Grazing pressure around the turlough is mostly fairly high and this prevents scrub and woodland from becoming established. Part of the floor of the basin is grazed by horses. Turloughmore is important for being the most northern turlough in the country. It is of ecological interest also for its relatively oligotrophic nature, and has a good representation of the associated vegetation types.

**4.2.5 Site Name: Flughany Bog SAC**
**SITE SYNOPSIS Version date: 26.08.2013**
**Site Code: 000497**

Flughany Bog is an example of a western raised bog, located 10 km south-east of Tobercurry. It is one of a series of small to medium-sized raised bogs which occur close to the north-westerly limit of raised bog formation along the border between counties Mayo and Sligo. Other bogs occurring in the area are Derrynabrock, Kilgarriff, Tawnabeg and Gowlaun Bogs. Flughany is comprised of two lobes which are separated by a ridge of mineral material. The bog displays some features of blanket bog morphology, such as the absence of a distinct dome. 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

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species: Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*). Most of the wet, high quality active bog at this site occurs in the south-eastern portion of the uncut high bog area. Here there is a well-developed pool and hummock system. The numerous inter-connecting pool systems and wet flats support Rhynchosporion vegetation. Typically, the vegetation is dominated by

*Sphagnum cuspidatum,* with White Beak-sedge, Great Sundew (*Drosera anglica*), Bogbean (*Menyanthes trifoliata*), Common Cottongrass (*Eriophorum angustifolium*), bladderworts (*Utricularia* spp.) and *Sphagnum auriculatum* also present. Wet lawns dominated by White Beak-sedge also occur on flat ground between some of the pool complexes. Low hummocks of bog mosses, including scarce species such as *S. imbricatum* and *S. fuscum*, are a feature of the bog surface. Degraded raised bog dominates most of the high bog surface. The driest and most disturbed marginal areas of the uncut high bog surface are typically dominated by more ecologically robust species such as Carnation Sedge*,* Heather (*Calluna vulgaris*), Deergrass and Bog Asphodel, which tend to form extensive mono-dominant swards. Further into the high bog, where the water levels are higher and more stable, the vegetation is less disturbed and more species-rich, and there is a high *Sphagnum* cover (typically 25 to 50%). Pool areas are rare in areas of degraded raised bog and where they occur they tend to be shallow and dominated by an algal mat with little *Sphagnum* cover. The bog provides habitat for birds. Flughany Bog supported approximately 160 Snipe in winter 1988/89. Snipe and Curlew breed here in summer and Red Grouse, a Red-listed species, is resident. Turf-cutting, particularly mechanised peat extraction, and drain excavation pose major threats to raised bogs, as they upset their sensitive hydrology. Grazing and fire can cause damage to the peat surface and vegetation. At Flughany, the structure of the bog is partially degraded mainly due to the effects of peat extraction along the margins of the high bog area. This peat cutting has lowered the water levels and has resulted in a species-poor flora, which has a low *Sphagnum* cover, over a substantial part of the surface. Flughany Bog, whilst small, is a good example of a relatively intact raised bog, and contains examples of the Annex 1 habitats active raised bog, degraded raised bog and depressions on peat substrates (Rhynchosporion). The site is also of note as it occurs close to the north-westerly limit of raised bog formation in Ireland. Overall, the site displays a good diversity of the flora and fauna that is typical of raised bog habitats.

**4.2.6 Site Name: Templehouse and Cloonacleigha Loughs SAC**
**SITE SYNOPSIS Version date: 10.09.2013**
**Site Code: 000636**

This site is located approximately 5 km north-west of Ballymote, Co. Sligo. It comprises three shallow, hard water lakes - Templehouse Lough, Cloonacleigha Lough and Killawee Lough - which are inter-connected by the Owenmore river. The lakes are situated on Carboniferous limestone, but are surrounded by low, peat-covered hills.
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):

[3140] Hard Water Lakes
[3260] Floating River Vegetation

Templehouse and Cloonacleigha Loughs support a wide diversity of wetland communities

including floating and submerged aquatic habitats, tall fen vegetation, carr and wet woodland. Other habitats within the site are mixed woodland, lowland wet grassland, raised bog and cut-away bog. The emergent vegetation of the lakes includes Common Reed (*Phragmites australis*), Common Club-rush (*Scirpus lacustris*), Slender Tufted-sedge (*Carex acuta*), Marsh-marigold (*Caltha palustris*), Marsh Willowherb (*Epilobium palustre*) and River Water-dropwort (*Oenanthe fluviatilis*). Yellow and White Water-lilies (*Nuphar lutea* and *Nymphaea alba*) and Ivy-leaved Duckweed (*Lemna trisulca*) dominate the floating vegetation. Five species of stonewort have been recorded from Cloonacleigha Lough: *Chara aspera*, *C. contraria*, *C. rudis*, *C. virgata* and *C. vulgaris* var. *longibracteata*, with the last-named also occurring in Templehouse Lough. Other submerged species present include Perfoliate Pondweed (*Potamogeton perfoliatus*), Spiked Water-milfoil (*Myriophyllum spicatum*) and Canadian Waterweed (*Elodea canadensis*). Also present along the shore of Cloonacleigha Lough are areas of fen and scraw (floating vegetation) which are rich in sedges (e.g. *Carex lasiocarpa, C. aquatilis, C. acuta*), along with fen pastureland with Tufted Hair-grass (*Deschampsia cespitosa*) and Tall Fescue (*Festuca arundinacea*). Mixed woodland occurs on the northern shores of Templehouse Lough. The dominant tree species are Pendunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*), and Beech (*Fagus sylvatica*); small amounts of Grand Fir (*Abies grandis*) are also present. A dense understorey of Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*) occurs in some parts. Both the Beech and Ash are extensively regenerating. Areas of more natural woodland with birch (*Betula pubescens* and *B. pendula*), Rusty Willow (*Salix cinerea* subsp. *oleifolia*), Eared Willow (*S. aurita*), Bay Willow (*S. pentandra*), Ash and Alder (*Alnus glutinosa*) also occur. The Red Data Book species Bird Cherry (*Prunus padus*) is known from the Templehouse area and may occur within the site. Epiphytic lichens such as Cup-moss (*Cladonia pyxidata*) and beard-mosses (*Usnea* spp.) are abundant here. Ground flora species recorded include Bluebell (*Hyacinthoides non-scripta*), Woodruff (*Galium odoratum*), Dog's Mercury (*Mercurialis perennis*), Lords-and-Ladies (*Arum maculatum*), Meadowsweet (*Filipendula ulmaria*), Water Mint (*Mentha aquatica*) and Yellow Loosestrife (*Lysimachia vulgaris*). The stretch of Owenmore River included in the site is meandering and slow-moving and hosts a diverse flora which achieves up to 80% coverage in places. Species present include Branched Bur-reed (*Sparganium erectum*), Yellow Water-lily, Broad-leaved Pondweed (*Potamogeton natans*), starworts (*Callitriche* spp.), River Water-dropwort and the non-native Monkeyflower (*Mimulus guttatus*). Tall fen vegetation, with stands of Common Reed, an abundance of sedges and a herb layer which includes the Red Data Book species Marsh Pea (*Lathyrus palustris*) occurs along the river. The complex of loughs, woodland and river channels makes this an important site for birds, especially wintering waterfowl e.g. Teal, Wigeon, Mallard, Tufted Duck and Goldeneye. There is also a relatively large wader population, including Lapwing, Curlew and small numbers of Greenland White-fronted Goose, a species listed on Annex I of the E.U. Birds Directive. Many bird species breed in the area, including Mute Swan and Great Crested Grebe, and the largest heronry in Co. Sligo, supporting approximately 16 breeding pairs, is found on the shore of Templehouse Lough. Furthermore, a population of Woodcock is managed for shooting on the Templehouse estate. Besides shooting, the area is used for coarse fishing and boating. Some agricultural land is included in the site and this is extensively grazed by sheep, and

less so by cattle, and some hay is also cropped. Potential threats to the site include: water pollution from domestic and agricultural sources; over-grazing of lough fringe vegetation and woodland ground flora; field drainage; peat cutting; and afforestation. A section of wetland has already been damaged by the construction of several large drains and some of its margins have been cut for turbary. Some conifer afforestation has also taken place. A proposed drainage scheme for the Owenmore River, if implemented, would pose a major threat to the area. This would result in both habitat loss and changes in the structure and species composition of some habitats. These events could also affect the bird and mammal populations and possibly result in the loss of some of the rare and specialised plants found at the site. Templehouse Lough, Cloonacleigha Lough and Killawee Lough, along with the Owenmore River, are an integral part of a scenic landscape. Within the site there is a diverse range of habitats, both aquatic and terrestrial, including two which are listed in the E.U. Habitats Directive. The site supports a range of uncommon plant species (some of these at their only known station for Co. Sligo), and most notably Marsh Pea. Furthermore, the site is of regional importance for birds. Overall it is of considerable conservation value.

### 4.2.7 Site Name: Lough Hoe Bog SAC

**SITE SYNOPSIS** **Version date: 10.09.2013**

**Site Code: 000633**

Lough Hoe Bog is an extensive area of undulating montane blanket bog and heath-covered rocky ridges on a lake-studded plateau in the Ox (Slieve Gamph) Mountains. It straddles the Mayo/Sligo county boundary. The underlying geology is of granite, gneiss and schist. The northern boundary of the site encompasses Lough Talt on the Tobercurry to Ballina Road, which is13 km from Tobercurry and 17 km from Ballina.

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):

[3110] Oligotrophic Waters containing very few minerals
[7130] Blanket Bogs (Active)*
[1013] Geyer's Whorl Snail (*Vertigo geyeri*)
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)

The plateau top is covered by a thin layer of blanket bog with areas of shallow inter-connecting pools. Hummocks are large and are formed from the mosses *Sphagnum papillosum* and *Racomitrium lanuginosum*, and Heather (*Calluna vulgaris*). The pools contain the bog moss *S. auriculatum*, Common Cottongrass (*Eriophorum angustifolium*) and Bogbean (*Menyanthes trifoliata*). In the drier areas, Deergrass (*Scirpus cespitosus*) and Hare's-tail Cottongrass (*E. vaginatum*) are abundant. In places, blanket bog grades into wet heath vegetation, while dry heath occurs on some of the steeper slopes and rocky outcrops.

There are numerous oligotrophic (nutrient-poor) lakes found on the site. Plant species

colonising these lakes include Bottle Sedge (*Carex rostrata*), Water Lobelia (*Lobelia dortmanna*), Bog Pondweed (*Potamogeton polygonifolius*) and rushes (*Juncus bulbosus* and *J. effusus*), amongst others. The rocky lake shores are frequently colonised by Common Yellow-sedge (*Carex demissa*) and wood-rush (*Luzula* sp.). Floating mats of vegetation, consisting mainly of Bogbean and Bog Pondweed have developed at the ends of some lakes, while Bulrush (*Typha latifolia*), Common Reed (*Phragmites australis*), Common Club-rush (*Scirpus lacustris*) and Water Horsetail (*Equisetum fluviatile*) are the main emergent species at the lake edges. There are three large rivers on the site, two in the south and the third to the north - the Lough Hoe River. Species commonly occurring by these rivers include Water Mint (*Mentha aquatica*), Selfheal (*Prunella vulgaris*), Bracken (*Pteridium aquilinum*) and Bog Pimpernel (*Anagallis tenella*). To the south of the river flowing from Lough Hoe is an area with numerous hollows, 5-10 m in diameter. These areas are dominated by Soft Rush (*Juncus effusus*), Star Sedge (*Carex echinata*), Wavy Hair-grass (*Deschampsia flexuosa*), Bell Heather (*Erica cinerea*) and Mat-grass (*Nardus stricta*). At the southern end of Lough Nalackagh there are areas of poorly developed inter-connecting pools, while another such pool system is found towards the north-west of the same lake. The rare Oak Fern (*Gymnocarpium dryopteris*) has been recorded from near Lough Talt, but it has not been seen there in recent years. The wetland snail, *Vertigo geyeri*, occurs in marsh vegetation on the shore on Lough Talt. This is a very rare, glacial relict species which is known in Ireland from only a small number of sites. It is rare and threatened in Europe and is listed on Annex II of the E.U. Habitats Directive. The presence in Lough Talt of a population of White-clawed Crayfish (*Austropotamobius pallipes*), a species also listed on Annex II of the E.U. Habitats Directive is also notable. Lough Talt also supports a population of the rare and threatened Red Data Book fish species, Arctic Char. An island in the lake formerly held a mixed colony of Common Gulls and Black-headed Gulls (46 and 280 individuals, respectively, in 1977/78). By 1992 this colony had all but disappeared, with only 4 pairs of the former species remaining. Grazing (by cattle and sheep) and turbary are the major land use activities in evidence on the site. Lough Hoe Bog is particularly vulnerable to afforestation, turbary and over-stocking. Despite some localised peat erosion and evidence of over-stocking, most of the site is relatively intact. Lough Hoe Bog contains a large area of good quality blanket bog, a habitat that is becoming increasingly rare in Ireland. The site also contains good quality examples of oligotrophic lakes. Both of these habitats are listed on Annex II of the E.U. Habitats Directive. The presence of several rare species, and in particular the E.U. Habitats Directive Annex II listed *Vertigo geyeri* and *Austropotamobius pallipes*, adds to the conservation significance of the site.

**4.2.8 SITE NAME: Lough Nabrickkeegh SAC**

**SITE SYNOPSIS** **Version date: 10.09.2013**

**SITE CODE: 000634**

Lough Nabrickkeagh Bog is located in the Ox Mountains, approximately 0.5 km north-west of Lough Talt in Co. Sligo. The bog overlies a substratum of metamorphic schist and gneiss, and ranges in altitude from 150 m to 260 m O.D. Topographical relief is provided by low, flat ridges, which tend to be drier than the flats in between.

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):

[7130] Blanket Bogs (Active)*

The site comprises two areas of highland blanket bog which are separated by a conifer plantation, but which are otherwise largely intact. These areas support a good diversity of vegetation communities and micro-topographical features typical of blanket bog. The vegetation is typically dominated by Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*) and Deergrass (*Scirpus cespitosus*), with a good cover of bog mosses (*Sphagnum* spp.) underneath. There is some variation in species abundance with altitude. Extensive areas feature systems of shallow, inter-connecting pools colonised by White Beak-sedge (*Rhynchospora alba*), Common Cottongrass (*Eriophorum angustifolium*) and occasional Bog-sedge (*Carex limosa*), with Round-leaved Sundew (*Drosera rotundifolia*) and Great Sundew (*D. anglica*) lining pool margins. Hummocks formed by bog mosses (including *S. imbricatum* and *S. fuscum*) are scattered throughout. These provide a slightly drier habitat for species such as Bilberry (*Vaccinium myrtillus*), and often have good growth of lichens, including the uncommon species, *Cladonia rangiferina*. Elsewhere, pools are more defined and somewhat deeper. These are frequently colonised by Bogbean (*Menyanthes trifoliata*) and the bog moss *S. cuspidatum*. Other areas have wet and quaking *Sphagnum* lawns with abundant White Beak-sedge. Several flushes occur on the site, mostly associated with streams, and some are iron-stained. The latter tend to be species-rich, with Bog Pimpernel (*Anagallis tenella*), Water Mint (*Mentha aquatica*) and Lesser Spearwort (*Ranunculus flammula*). Cranberry (*Vaccinium oxycoccos*) occurs in some of the flushes (this species is more commonly found on the raised bogs in the midlands of Ireland), and Eared Willow (*Salix aurita*) is an occasional coloniser. Lough Nabrickkeagh has a stony bottom and is colonised by aquatic species such as Shoreweed (*Littorella uniflora*) and Bulbous Rush (*Juncus bulbosus*), with White and Yellow Water-lily (*Nymphaea alba* and *Nuphar lutea*). Water Horsetail (*Equisetum fluviatile*) occurs as an emergent. The shoreline is colonised by species such as Soft Rush (*Juncus effusus*), Heath Rush (*J. squarrosus*) and Common Yellow-sedge (*Carex demissa*). Parts of the bog were cut for

turf in the past and the abandoned cut-away areas are now regenerating with abundant bog mosses and some of the vascular plants typically found on the intact bog. The bog provides valuable habitat for Red Grouse. The major threats to blanket bogs stem from peat exploitation, drainage, afforestation, over-stocking with grazing animals and burning. Afforestation has already decreased the area of intact bog at this site, but those areas which do remain appear remarkably undamaged by grazing and fire. Blanket bog is an increasingly rare habitat, and as such, receives priority status on Annex I of the E.U. Habitats Directive. Lough Nabrickkeagh is a good example of an intact highland blanket bog and is of considerable conservation value.

**4.2.9 Site Name: Ox Mountains Bogs SAC**
**SITE SYNOPSIS Version date: 20.07.2016**
**Site Code: 002006**

This site comprises several upland blanket bogs situated in the Slieve Gamph, or Ox Mountain range, on the border between counties Sligo and Mayo. The town of Tobercurry lies approximately 12 km to the south-east. Most of the underlying rock is composed of metamorphic schists and gneisses, but igneous intrusions are also found, as at the silica-rich granitic ridge to the east of Easky Lough. 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):

[3110] Oligotrophic Waters containing very few minerals
[3160] Dystrophic Lakes
[4010] Wet Heath
[4030] Dry Heath
[7130] Blanket Bogs (Active)*
[7140] Transition Mires
[7150] Rhynchosporion Vegetation
[1013] Geyer's Whorl Snail (*Vertigo geyeri*)
[1528] Marsh Saxifrage (*Saxifraga hirculus*)

Extensive areas of active blanket bog occur throughout this site. The dominant and most frequently occurring vascular plant species are Heather (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Deergrass (*Scirpus cespitosus*), Purple Moor-grass (*Molinia caerulea*), Common Cottongrass (*Eriophorum angustifolium*) and Hare's-tail Cottongrass (*E. vaginatum*). Bog mosses such as *Sphagnum papillosum* and *S. capillifolium* occur commonly through the site and contribute significantly to the vegetation. Another important feature of the site is the large number of dystrophic, bog pool systems that occurs. The pools and their margins, as well as the quaking lawns between the pools, are dominated by Rhynchosporion vegetation. This vegetation is characterised by the bog moss *Sphagnum cuspidatum* and often an abundance of White Beak-sedge (*Rhynchospora alba*). The recently discovered *Sphagnum beothuk*, a highly oceanic and amphi-Atlantic species, occurs in the wettest

hummock and pool systems. Other species which occur in these wet areas include Bogbean (*Menyanthes trifoliata*), Common Cottongrass (*Eriophorum angustifolium*), Bog-sedge (*Carex limosa*), Lesser Bladderwort (*Utricularia minor*), Oblong-leaved Sundew (*Drosera intermedia*) and a diversity of bog mosses including *S. auriculatum.* Between the pools, hummocks topped with Heather, lichens (*Cladonia* spp.) and the moss *Racomitrium lanuginosum* occur. Several oligotrophic lakes occur on the site, the largest of which is Easky Lough. This is a stony-bottomed lake which supports aquatic vegetation typical of such lakes, i.e. Shoreweed (*Littorella uniflora*), quillwort (*Isoetes* sp.), Bulbous Rush (*Juncus bulbosus*), Water Lobelia (*Lobelia dortmanna*), Common Spike-rush (*Eleocharis palustris*), Water Horsetail (*Equisetum fluviatile*), Sharp-flowered Rush (*Juncus acutiflorus*) and Bog Pondweed (*Potamogeton polygonifolius*), amongst others. Wet heath is fairly extensively developed on the site, particularly on the lower slopes of the north-facing side of the Ox Mountains and along the numerous stream valleys that descend from the plateau. Drier heath areas occur in other parts of the site; these typically have vegetation of Heather, Heath Rush (*Juncus squarrosus*) and Purple Moor-grass and are often grazed by sheep. The regionally scarce mosses *Sphagnum recurvum* var. *tenue*, *S. fuscum, S. imbricatum*, *S. strictum* and the liverwort *Cladopodiella fluitans* occur in blanket bog vegetation on this site. Marsh Saxifrage (*Saxifraga hirculus*), listed under Annex II of the Habitats Directive and also on the Flora (Protection) Order, 2015, is found in association with a flush system near Letterunshin. A population of the whorl snail *Vertigo geyeri* has recently been recorded from an area of calcareous fen within the site. This is a nationally rare species that is listed on Annex II of the E.U. Habitats Directive and the Ox Mountains record constitutes only the second known population in Co. Sligo. During the winter months the bogs are used by a flock of Greenland White-fronted Goose (40-50 birds, and occasionally up to 80, have been counted at Easky Bog). In the summer a number of pairs of Golden Plover breed. Both these species are listed on Annex I of the E.U. Birds Directive and in the Irish Red Data Book. The site is vulnerable to fragmentation by an extension of adjacent land uses, in particular afforestation and turbary. The Ox Mountains Bogs SAC is of considerable conservation significance, due primarily to the extensive, largely intact areas of blanket bog it contains. This habitat is listed, and given priority status, on Annex I of the E.U. Habitats Directive. The value of the site is increased by the presence of good examples of several other annex-listed habitats, i.e. wet heath, dry heath, oligotrophic lakes, transition mires, Rhynchosporion vegetation and dystrophic lakes. Also of note is the presence of Marsh Saxifrage and *Vertigo geyeri*, both nationally rare species, and the populations of two rare and threatened bird species. Part of the site has been designated as a Statutory Nature Reserve.

**The conservation objectives, supporting documentation and the Natura 2000 data for each site can be accessed on the NPWS web site which are publically available.**

**4.3 Screening of the Identified Natura Sites**

At this juncture it is prudent to screen each identified SAC and SPA to eliminate those on which the proposed development will not have a direct or indirect effect, while identifying those sites on which the proposed development may have a direct or indirect effect. The matrix (T1-T2) out lines this process in a concise and succinct manner. This process takes into account the size, scale, nature and location of the development in relation to the location, conservation objectives and species of the various Natura sites.

| **T1: River Moy SAC 002298** | | |
|---|---|---|
| **Potential Impact** | **Direct Effect** | **Indirect Effect** |
| Loss of Habitat | Yes – land take from the SAC – GA1 non annexed habitat type (0.00003% low ecological value). No annexed habitat types present on site. | No |
| Habitat Fragmentation | Yes – Technical fragmentation however no impact predicted on SAC species as mainly aquatic or in close proximity to aquatic section. | No |
| Disturbance | Yes – disturbance limited to site area only with no disturbance of annexed species or species for which the SAC was designated. | No |
| Impacts on migration | No | No |
| Impact on Annexed Species | None – predominantly aquatic | None – predominantly aquatic |
| Reduction in annexed species density | None – predominantly aquatic | None – predominantly aquatic |
| Water quality (surface or ground water) | No – discharge to surface water or ground water | No – no discharge to surface water or ground water |
| Water resource | No – no abstraction from surface water or ground water | No – no abstraction from surface water or ground water |
| Light | No absorbed into back ground | No absorbed into back ground |
| Noise | No – absorbed into back ground | No – absorbed into back ground |
| Vibration | No absorbed into back ground | No absorbed into back ground |
| Compaction | No | No |
| Traffic | No absorbed into back ground | No absorbed into back ground |
| Synergistic effects | No | No |
| Introduction of xenobiotics to aquatic environment | No | No |
| Construction | No absorbed into back ground | No absorbed into back ground |
| Habitation | No absorbed into back ground | No absorbed into back ground |
| Air quality | No absorbed into back ground | No absorbed into back ground |
| Climatic | No | No |
| Interference with the key relationships that define the structure of the site | No | No |
| Interference with the key relationships that define the function of the site | No | No |

**T2: (2) Doocastle Turlough SAC 000492, (3) Cloonakillina Lough SAC 0001899, (4) Turloughmore SAC 000637, (5) Flughany Bog SAC 000497, (6) Templehouse & Cloonadeigha Lough SAC 000636, (7) Lough Hoe Bog SAC 00633, (8) Lough Nabrickkeagh Bog SAC 00634, (9) Ox Mountain Bog SAC 002006**

| Potential Impact | Direct Effect | Indirect Effect |
|---|---|---|
| Loss of Habitat | None as not located within the boundary of these Natura Sites | None as not located within or adjacent too these Natura Site |
| Habitat Fragmentation | None as not located within the boundary of these Natura Sites | None as not located within or adjacent to thee Natura Sites– separation distance >7Km |
| Disturbance | None – separation distance to the Natura sites with nearest designated due to habitat type | None as not located within or adjacent to these Natura Site with limited scale |
| Impacts on migration | None given the limited scale of the operation and the separation distance involved. | None – separation distance 78Km |
| Impact on Annexed Species | None given the limited scale of the project and the separation distance involved. | None– separation distance >7Km |
| Reduction in annexed species density | No land take from these Natura sites or removal / deposition of material within its boundary. | None– separation distance >7Km |
| Water quality (surface or ground water) | No direct links to the Natura sites which is up the hydro geological and topographical gradient from the site. | No direct discharges to surface water |
| Water resource | No abstraction of water from ground water or surface water. | No discharges to groundwater or surface water associated with these sites. |
| Light | None given separation distance to the natura sites | None |
| Noise | In verse square law and separation distance dictates that no noise impact on the Natura sites – separation distance >7Km | In verse square law and separation distance dictates that no noise impact on these Natura sites |
| Vibration | ppv of a hydraulic roller at 25M is only 1.5mms with a truck on rough surfaces only produce a ppv of <2mm/s at 20M therefore vibration from construction and subsequent use would be undetectable in the Natura site. – separation distance >7Km | None |
| Compaction | None due to separation distance | None due to separation distance – separation distance >7Km |
| Traffic | None due to separation distance | None due to separation distance – separation distance >7Km |
| Synergistic effects | None | None |
| Introduction of xenobiotics to aquatic environment | None | None |
| Habitation | None given the separation distance these natura sites | None given the separation distance involved . |
| Air quality | None given the separation distance | None given the separation distance and limited scale of the operation. |
| Climatic | None given the limited scale of the operation and the separation distance involved. | None given the limited scale of the operation and the separation distance involved. |
| Interference with the key relationships<br><br>that define the structure of the site | None given the separation distance – separation distance >7Km | None given the separation distance– separation distance >7Km |
| Interference with the key relationships<br><br>that define the function of the site | None given the separation distance – separation distance >7Km | None given the separation distance– separation distance >7Km |

### 4.3.1 Analysis of Screening Report

The screening report indicates that only one of the designated sites, the River Moy SAC, may be directly impacted by the proposed development The land take is such that it will not directly or indirectly impact on any annexed habitat or species of the River Moy SAC, which are predominantly aquatic, nor will it contravene the conservation objectives or plans for the designated site. The proposed project is within the boundary of the River Moy SAC however the site represents 0.00263% of GA1 un annexed habitat.

By virtue of the separation distance between the proposed development site and the other Natura sites considered within the 15Km radius can be effectively screened out due to the lack of direct and indirect links. The proposed development would not have any significant or insignificant, direct or indirect impacts on them nor would it contravene their Conservation objectives as the separation distance is >7Km.

### 4.3.2 Rationale for Site Designation

Site designation tends to be a function of habitat and / or species present. For the purpose of clarity the following tables have being created to indicate the eco-logic for designating the River Moy SAC.

**Table: T3 Habitats Associated with the River Moy SAC**

| HABITAT | CODE | ANNEX** |
|---|---|---|
| Alluvial Wet Woodland | 91E0* | I |
| Raised Bog | 7110* | I |
| Degraded Raised Bog | 7120 | I |
| Old Oak Wood Lands | 91A0 | I |
| Rhynchosporion | 7150 | I |
| Wet Grassland | 6410 | |
| Blanket Bogs | 7130* | I |
| Fens | 7230 | |
| Quaking Bog | 7140 | |
| Lakes | 3130 | |
| Estuaries | 1130 | |
| Floating River Vegetation | 3260 | |
| Tidal Mudflats and Sandflats | 1140 | |

* Priority Habitat **E.U. Habitats Directive

**Table: T4 Species Associated with the River Moy SAC**

| SPECIES | SPECIES | | DESIGNATION |
|---|---|---|---|
| Atlantic Salmon | *Salmo salar* | F | Annex II |
| Otter | *Lutra Lutra* | M | Annex II |
| Sea Lamprey | *Petromyzon marinus* | F | Annex II |
| Brook Lamprey | *Lampetra planeri* | F | Annex II |
| White Clawed Cray Fish | *Austropotamobius pallipes* | F | Annex II |
| Intermediate Wintergreen | *Pyrola media* | P | |
| Lesser Twayblade | *Listera cordata* | P | |
| Atlantic Charr*** | *Salvelinus alpinus* | F | IRDB |
| Heath Cudweed | *Omalotheca sylvatica* | P | IRDL |
| Great Burnet | *Sanguisorba officinalis* | P | IRDL |
| Irish Ladies Tress | *Spiranthes romanzoffiana* | P | IRDL |
| Common Frog | *Rana temporaria* | A | Annex V, IRDB |
| Daubenton,s Bat | *Myotis daubentoni* | M | Annex IV, IRDB |
| Badger | *Meles meles* | M | IRDB |
| Irish Hare | *Lepus timidus hibernicus* | M | Annex V, IRDB |
| Pine Martin | *Martes martes* | M | Annex V, IRDB |
| Greenland White Fronted Goose | *Anser albifrons* | B | Annex I* |
| Whooper Swan | *Cygnus cygnus* | B | Annex I* |
| Golden Plover | *Pluvialis apricaria* | B | Annex I* |
| Tufted Duck | *Aythya fuligula* | B | |
| Coot | *Fulica atra* | B | |
| Golden Eye | *Bucephala clangula* | B | |
| Teal | *Anas crecca* | B | |
| Wigeon | *Anas penelope* | B | |
| Common Scooter | | B | RLS |
| Mallard | *Anas platyrhynchos* | B | |

RLS: RED LISTED SPECIES, ANNEX I &II OF EU HABITATS DIRECTIVE
IRDB: IRISH RED DATA BOOK , *** MAY BE EXTINCT,
IRDL: IRISH RED DATA LIST, * EU BIRDS DIRECTIVE

It is evident from the previous table that the SAC contains a nationally important species which is considered significant and warrants conservation.

### 4.4 Conservation Objectives

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, is stable or increasing, and
- the ecological factors that 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 as defined below.

The favourable conservation status of a species is achieved when:

- population data on the species concerned indicate that it is maintaining itself, and
- the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Objective 1: To maintain the Annex I habitats for which the SAC has been selected in a favourable conservation status:

Objective 2: To maintain the Annex II species for which the SAC has been selected at favourable conservation status i.e. *Lampetra planeri, Lutra Lutra, Salmo salar, Austropotamobius pallipes,*

Objective 3: To maintain the extent, species richness and biodiversity of the entire site.

Objective 4: To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

In addition to the above conservation objectives a “Framework for Corncrake Conservation to 2022” (version: 03 November 2015) has also been generated by NPWS which mentions makes reference to the Moy Valley.

The Corncrake conservation work is composed of the following primary elements:
(1) Continued monitoring

(2) Continuation and expansion of a range of schemes to protect birds and to provide adequate habitat

(3) Predator control in areas where it may prove effective

(4) Management of the Corncrake SPA network

The formulation and implementation of this strategy is overseen by a Steering Committee comprising staff of the National Parks and Wildlife Service of the Department of Arts, Heritage and the Gaeltacht and BirdWatch Ireland. The Steering Committee may also consult with other relevant Departments including Department of Agriculture, Food & the Marine, other State bodies, landowner representative groups and Non-Governmental Organisations.

**Corncrake Conservation Schemes**

There are four established management schemes currently in existence (none of which apply to the Moy Valley or River Moy SAC):

1. NPWS Corncrake Grant Scheme (CGS)

2. NPWS Corncrake Farm Plan Scheme (CFPS)

3. Agri-Environment Options Scheme (AEOS) closed to new applicants, though existing plans may remain in operation

4. Green Low-carbon Agri-environment Scheme (GLAS)

As well as these schemes, further conservation efforts of note are the ongoing habitat creation and management works undertaken by Bird Watch Ireland and others in Corncrake areas however these do not apply to the Moy Valley or River Moy SAC. NPWS has purchased some land in key Corncrake areas in order to secure long term management initiatives in these areas into the future. Further works are carried out on other lands and are described in the Annual Corncrake Reports published by the National Parks & Wildlife Service.

# 5 ASSESSMENT OF LIKELY EFFECTS

## 5.1 CONSIDERATION OF SIGNIFICANCE

In terms of significance, the NPWS Guidance (2010 Rev) uses an EC definition as follows:.." *any element of a plan or project that has the potential to affect the conservation objectives of a Natura 2000 site, including its structure and function, should be considered significant (EC, 2006)".* Other guidance documents also discuss significance criteria, some in more detail than others.

In general, significance indicators might include but are not limited too:

- impact on Annex I habitat (including loss or reduction in size - percentage relative to the overall area of the habitat in the Natura site; impairment of function);
- fragmentation of habitat or population (depending upon the duration or permanence);
- disturbance (noise, light etc. - distance, duration);
- effect on species populations (direct or indirect damage to size, breeding patterns etc);
- changes in water quality.

In the context of the Habitats Directive significant effects may be described as follows: "...Within the Habitats Regulations, significance is quite different It is used as a coarse filter and the test is a question over the possibility that there will be a significant effect on a key receptor that determines the conservation status of a European site. Thus, determining whether there will be a likely significant effect' does not imply that there will be such an effect or even that such an effect is more likely than not; it simply flags the need to test the issues and then make a judgement of the pathways and mechanisms imposed by a project on the designated wildlife interest. This test best equates to the screening and scoping opinions sought for an EIA but is confined to the Natura 2000 and Ramsar interest rather than wider environmental or nature conservation issues"( Morris (2008)).

In order to assess the likely impacts and ascertain whether a significant impact on the integrity of the Natura site(s) is likely to occur as a result of the proposed development, should the appropriate assessment process deemed to be required, it is necessary to consider what constitutes the integrity of a Site as referred to in Article 6(3). The document *Managing Natura 2000 Site, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC* (2000) gives clear guidance in this regard and states: *"The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives".*

Integrity has been debated and defined in various ways in guidance documentation and literature. For example, Treweek (1999) discusses biological integrity and ecosystem health, and refers to three generally accepted criteria: systematic indicators of ecosystem functional and structural integrity; ecological sustainability or resilience (relating to the ability

of a system to withstand "natural" or anthropogenic stresses); and absence of detectable symptoms of ecosystem disease or stress. A similar, but less academic, approach is adopted by the various guidance documents with a number of definitions proposed. The essence of the concept of ecological integrity is distilled in the following definition from *Planning Policy Statement 9* (UK Department of Environment, 1994 - now superseded by PP9, 2005): *"coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified"*

## 5.2 POTENTIAL IMPACTS ON THE NATURA SITE - IMPACT PREDICTION

The nature of the relatively small proposed development on site dictates that it lacks the potential to significantly negatively impact on the River Moy SAC by virtue of its scale and lack of magnitude. The criteria for assessing impact level have been extracted from those prescribed in Appendix 4 of the NRA EclA Guidelines (2004) criteria. Terminology for impact significance and duration mirrors that set out by the EPA (2003). The potential impact magnitude described is the following sections, without mitigation, is neutral unless otherwise stated as being positive or negative. Where the impact is stated as being localised, it refers to the immediate area of proposed site.

### 5.2.1 Potential impacts on the SAC Habitats

The proposed development will not directly impact on any qualifying habitat for the River Moy SAC. There is a land take of low ecological value GA1 non annexed habitat form the SAC which represents 0.00263% of the over all designated Natura area. The current land use precludes any annexed species from utilising the proposed development site with no prospect of it reverting to an annexed habitat type.

The proposed development will be confined directly to the target area. This will result in extremely localised impact in the context of the designated site as a whole and the Annex habitat types present therein. No impact on qualifying or non-qualifying ED annexed habitats outside the immediate area of the site, either during construction or subsequent habitation, is anticipated or expected. The land take does not fragment the aquatic habitat with a 45M riparian zone remaining along the River bank which is outside of the site boundary.

#### 5.2.1.1 Potential impacts on qualifying Avian species for the SAC

The proposed development will not impact, either directly or indirectly, on any qualifying Avian species for which the River Moy was designated. The majority of these species are confined to the lentic / lotic systems within the SAC. There are no records of *Alcedo atthis* being present at this location and if present would be confined to the channel. Not withstanding this, the site is sufficiently removed (45M) from the river channels to ensure that

should the species be present it would not utilise the development site given the lack of suitable habitat for roosting / nesting or feeding. Other Annexed Avian species and Red List Species are confined to Lough Cullin and Conn which have no direct links to the site. The current land use and lack of suitable habitat dictates that it is not used by such species for the reasons outlined below.

(i) Current land use leading to a short sward with bovine grazing which would prohibit ground nesting species from using the site.

(ii) Traffic movement (agricultural (both on site and off) and domestic)

(v) Disturbance and predation by domesticated animals in particular felines, canines.

(vi) Absence of suitable habitats i.e no potential nesting sites or suitable roosts.

(vii) Plot size is such that it lacks sufficient land cover to support populations of annexed species.

(viii) The impact of the wild mink population predating on ground nesting species

(ix) The absence of a concerted sustained predator control program in the area. The impact of predators on ground nesting is regarded as a potential threat particularly in areas of where the suitable habitat is fragmented, or on islands that are subject to a high degree of grazing pressure and/or where cover is in short supply. For example targeted predator control has been carried out in core Corncrake areas since 2010. The recent increases in Corncrake numbers in areas where predator control has taken place may be a reflection of this control, though it is difficult to identify the impact of predator control in isolation from other initiatives. This predator control is also likely to be of benefit to other species of conservation concern.

The River Moy SAC was not designated for the presence of the Corncrake (*Crex crex)* In 2000, BirdLife International produced an updated list of Important Bird Areas (IBAs) in Europe6. Of the 140 Republic of Ireland IBAs, seven were listed for Corncrake The Moy Valley was not included for Corn Crake conservation as the species was lost to that area since 1997 with the last calling male recorded in 1999. The European Court of Justice in Case C-418/04 found that Ireland ought to have classified the Moy Valley on the grounds that this area “had numerous Corncrakes in the 1980s until the mid-1990s… it follows that that site was one of the most suitable areas for conservation of the Corncrake… which is in line with the case-law cited in paragraph 37 of this judgment [Case C-3/96].” However Ireland does not propose to designate the Moy Valley on the grounds that such a designation would not be feasible for the following reasons:

(1) The long term absence of Corncrakes in the general area of the Moy Valley

(2) The disappearance of the Corncrake notwithstanding substantial suitable areas of habitat

(3) The distance from the Moy Valley to potential source stocks

The global population is estimated to be between 1.8 and 3.2million singing males (BirdLife International 2016) with at least 1.5 million of these in Russia. At least 300,000 are thought to breed in the Eastern European strongholds of the Baltic States, Georgia, Ukraine, Poland

and Romania (Koffijberg & Schaffer 2004). Western European populations are much smaller, with populations of more than 1000 being found only in Germany (Schaffer & Green 2001) and Scotland (Wotton et al. 2015). The reversal of population declines across the range has been limited; however, due to the recent discovery of large Eastern populations and the fact that population declines predicted in 2004 have not occurred, the Corncrake was reclassified in the IUCN Red List from 'Vulnerable' to 'Near Threatened' and finally to 'Least Concern' in 2010 (Schaffer & Barov 2011, Birdlife International 2014). It should be noted however that this was on the basis of improved knowledge of the species' global population and its reduced extinction risk, rather than on a genuine recovery to favourable conservation status across its range. The species remains a high conservation priority; at a European level it is included in Appendix II of the Bern Convention, Annex I of the Birds Directive (2009/147/EC), and is listed on the Red List of Conservation Concern of most European countries. The International Single Species Action Plan (ISSAP), to which many range states are signatories as part of the African Eurasian Waterbird Agreement (AEWA), was updated in 2006 (Schaffer & Barov 2011). In Ireland, Corncrake is on the Red List of Birds of Conservation Concern in Ireland due to historical declines (Colhoun & Cummins, 2014).

The most recent assessment of Corncrakes in Ireland, submitted in Ireland's report to the EU under Article 12 of the Birds Directive, notes an 85% decrease in population since 1978 and a 92% decrease in range.

The current land use of the proposed site results in a lack of suitable habitat dictates that it is not used by the species for the reasons outlined below.

(i) Current land use leading to a very short sward due to intensive bovine grazing which would prohibit ground nesting species from using the site.

(ii) Traffic movement on the site (agricultural machinery)

(v) Disturbance and predation by domesticated animals in particular felines, canines and other predatory avian species which is exacerbated by the lack of cover..

(vi) Absence of suitable habitats i.e no potential nesting sites or suitable roosts.

(vii) Plot size in that the proposed development site lacks sufficient land area to support populations of annexed species.

Although there is a land take form the SAC in the magnitude of 0.00263% there will be no impact on the Corn Crake due to its absence from the Moy valley .

#### 5.2.1.2 Potential impacts on qualifying Mammalian species for the SAC

Species such as *Lutra Lutra, Martes martes, Meles Meles* and *Lepus timidus hibernicus* will not use the site given the continual disturbance from the local access road, land use, short sward length and plot size. The current land use has resulted in a short sward length over an extended area surrounding the proposed site which offers no suitable cover for large mammalian species or for species such as *Erinaceus europaeus* or *Scirurus vulgaris*

*Lutra Lutra* is a reclusive species that tend to be found within 80M of suitable habitat therefore as the Owengarve River is at its closest is 45M to the West it can be inferred

that the species will not be impacted as it would be confined to the lotic / lentic sections of the SAC or the areas immediately adjacent to it.

*Myotis daubentoni* has being recorded in the SAC, this species use the river bridge as a roost with the feeding pattern confining them to the river the river channel therefore the proposed development would not directly affect them either through construction or subsequent habitation given the separation distances involved. There are no suitable roosts present on site for any bat species. However any factors which affect water quality could indirectly affect *Myotis daubentoni* by reducing entomological prey species. This is examined further in the section on impacts on qualifying aquatic species.

#### 5.2.1.3 Potential impacts on qualifying Aquatic species for the SAC

There are no direct on site link / channels between the proposed development site and the River channel. Precautionary measures would negate any potential indirect effects on the identified River. The NPWS publications on the "Survey of Juvenile Lamprey Populations in the Moy Catchment" , " An outline of the biology, distribution and conservation of Lampreys in Ireland" and "Ireland Red List No.5 Amphibian, Reptile and Freshwater Fish" all identify the threats to the populations of such species as water pollution, dredging and weirs impeding up river penetration of these species none of which will occurs as a result of the proposed development.

The white clawed cray fish (1092) is recorded upstream. The species requires a Q value of 3-4 at all times with disease and alien crayfish species identified as the main threats. The proposed project would not increase or exacerbated the threats with no negative impacts on water quality anticipated provide suitable environmental control measures are employed with respect to water quality.

Neither Otter nor the fresh water pearl mussels are recorded at this location in the River Moy SAC.

The potential causes for the reduction of water quality during construction are increase in suspended solids, contamination with hydrocarbons, contamination with cementatious material and contamination with synthetic compounds (paints, water proofers, mortar mix ect) with the connection to the Curry WWTP also considered and indicates that it's loadings are well below the 400p.e. design criteria .

Any activity that has the potential to indirectly impact on water quality also has the potential to impact on qualifying aquatic species. For example Suspended solids can affect the gills of *Salmo salar.* Any agent that adversely impacts on the benthic fauna can have ramifications for *Myotis daubentoni* prey species. However appropriate mitigation measures can be employed on site to negate all the potential direct or indirect effects.

#### 5.2.1.4 Potential impacts on qualifying Botanical species for the SAC

There will be no impact on any qualifying, or listed, species of plant. No annexed botanical species were observed during the ecological survey which would be expected given the current site use which has resulted predominantly in a monoculture of agricultural grasses which are subject to bovine grazing and chemical fertiliser.

#### 5.2.1.5 Other factors that may impact on the SAC

Noise, vibration, air quality and light will not impact on the SPA/ SAC habitat or annexed species, outside of the development site area, either during construction or subsequent use either directly or indirectly.

There are no climatic considerations associated with the development.

Fugitive dust generated predominantly during the construction of the proposed development could be described as inert and harmless in the chemical context and would not contain any of the harmful compounds as described and listed in Atmospheric Emissions by T.A. Luft, (1986), section 2.3. The main concerns with respect to dust are generally experienced within 100m of a significant dust source and it can be inferred that there will be no negative impact on the Natura site as the proposed project is not considered a dust source (during construction or subsequent habitation).

The noise source is external in nature and its dimensions are small compared to the location, in respect to the designated sites, then as the sound energy is radiating it will spread over an area that is proportional to the square of the distance. As this is an inverse square law then the sound level will decline by 6dB for each doubling of distance and will not have a deleterious effect on the Natura site, either during construction or subsequent habitation, outside of the development site area. Typical values in the vicinity of the development post construction would be in the order of 45-55 dB with RTN from the L4504 remaining the main noise source.

Interference with Natura site outside of the proposed development site boundary due to vibration would not occur given its nature and scale for example ppv of a hydraulic roller at 25M is only 1.5mms with a truck on rough surfaces only produce a ppv of <2mm/s at 20M.

Outside of the development site area the Natura site will not be affected by light, compaction, traffic, air quality or climatic factors given its scale and location either through construction or subsequent habitation. Although it is possible to apply a plume dispersion model to calculate the impact of the development on air quality, a stochastic approach has being adopted in that the nature of the development when considered in the context of its location and scale and given the wind rose (see map 2a) then the dilution effect would be such that the limit values for $SO_2$ (20µg/$M^3$ protection of vegetation) and NO + $NO_2$ (30 µg/$M^3$ protection of ecosystems) would not be approached either by the construction or use of the proposed development, when considered in isolation or in conjunction with other existing or proposed developments. Compaction is limited directly to the area of the proposed development.

The development will not have a negative impact on water resources either qualitatively or quantitatively as there are no direct discharge to ground water or abstraction from it.

No negative changes to surface water quality (microbiologically, chemically, physically or quantitatively) are anticipated given that there are no direct discharges to or abstraction from surface water with the proposed development to connect to the Curry WWTP which has excess capacity i.e. WWTP loading design = 400p.e. with the current loading in the magnitude of 216 p.e..

## 5.3 Cumulative impacts

### 5.3.1 Introduction

The potential cumulative impacts on the River Moy SAC from the proposed development in combination with the impacts from other significant projects are assessed in this section. As indicated in section 5.2.1.3 above, impacts on the SAC from the proposed development are confined to the land take. It is not anticipated that the proposed development will impact on water quality when the mitigation measures, which are based on the precautionary principle, are implemented. Given the importance of the River Moy as a salmonide river, water quality is strictly controlled and any development that would lead to deterioration in water quality is thoroughly scrutinised by the Local Authority. The Local Authority, NWFB and NPWS all collaborate to ensure water quality is not adversely affected thereby maintaining the ecosystems and habitats essential for the annexed species.

### 5.3.2 Potential for Cumulative Impact

There is no potential for a cumulative negative impact on the SAC given that water quality will not be adversely affected on implementation of the mitigation measures. Qualifying species and habitat are not affected by the proposed development. The impact on water quality is considered to be neutral (see section 6), Although there is a land take from the SAC this is non annexed GA1 habitat therefore it is considered that the potential impact is neutral with respect to annexed habitats and species.

# 6 EFFECTS ON OTHER PLANS OR PROJECTS

The “Framework for Corn Crake Conservation to 2022 (version:03 Nov 2015” is considered in other section of this report. In addition to that plan the following were also considered.

The National River Basins Management plans were created in response to the water frame work directive must also be considered. Under the management plan it is proposed to increases (or maintain) surface water and ground water quality to ‘Good Status’”. To ensure this objective is achieved then no plan or project is permitted that would contravene this.

The 2018 – 2021 River Basin Management plans Catchment assessment are not yet available and are currently being completed by the Environmental Protection Agency’s Catchment Science and Management Unit. On April 17th 2018 the Government published the River Basin Management Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will undertake to improve water quality and achieve ‘good’ ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027, which is an extension to the original time frames which were prescribed under the 1st cycle WFD targets and objectives. Ireland is required to produce a river basin management plan under the Water Framework Directive (WFD) which is the overarching legislation governing this approach. The Plan provides a more coordinated framework for improving the quality of waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland. The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are considered significant. A key purpose of the River Basin Management Plan (RBMP) is to set out priorities and to ensure that implementation is guided by those priorities, which detail the approach and infrastructural requirements. The key water quality data still originates in the first phase i.e. under the WFD data sets which have yet to be updated therefore the EPA Q values are more pertinent regarding empirical evidence when completing the AA process. Currently the RBMP is essentially a green paper on water quality which will require considerable capital investment from central government if the objectives are to be achieved within the prescribed time scales however to date no such commitment has being made.

This second-cycle River Basin management Plan 2018 – 2021 aims to build on the positive aspects of the first cycle WFD, and to acknowledge and address those aspects which did not achieve the prescribed or anticipated objectives and targets. The risk assessment is based on the monitoring data for the period 2007–2015, including data on status, water quality trends and the scale of the challenges involved in meeting the

environmental targets set by the WFD. Where the monitoring data indicated that there was a risk that the environmental objectives would not be achieved in respect of certain water bodies, an assessment was then carried out to identify the significant pressures impacting on that water status. The River Basin Management Plan (RBMP) sets out a range of actions aimed at moving towards the objectives of the EU Water Framework Directive (WFD). In terms of devising a strategy for implementation, it must be acknowledged that the planned actions are diverse, involve multiple stakeholders and will be implemented taking account of the available resources. Planned actions range from national measures implemented by national authorities (such as the Irish Water Capital Investment Plan and the Nitrates Action Programme) to sub-catchment management and water-body specific measures that need to be refined and implemented at a local level

This River Basin Management Plan (RBMP*)* sets out the measures aimed at protecting water bodies and addressing the pressures on those water bodies considered *"At Risk"* of not meeting the desired objectives of the Water Framework Directive (WFD). The approach adopted towards implementation centers on identifying and prioritising water bodies "for action" and ensuring effective delivery of environmental standards through a co-ordinated intervention at all levels. The River Basin Management Plan outlines the new approach that Ireland will take to protect our waters over the period to 2021. It builds on the experience from the first planning cycle in a number of areas:

(1) Stronger and more effective delivery structures have been put in place to build the foundations and momentum for long-term improvements to water quality

(2) A new governance structure, which brings the policy, technical and implementation actors together with public and representative organisations. This will ensure the effective and coordinated delivery of measures.

(3)The newly-established Local Authority Waters and Communities Office(link is external) will help people to get involved in improving water quality at a local level. An Fóram Uisce, also newly established, is a forum for stakeholders, community groups and sectoral representatives. It will analyse and raise awareness of water issues.

An enhanced evidence base has been developed to guide national policies and the targeting of local measures. Technical assessments of 4,829 water bodies have been carried out, examining their status (quality) and whether they are 'at risk' of not meeting status objectives in the future. Using this information, the Plan sets out national policies and regional prioritised measures to ensure the specific targets are achieved.

Among the main actions that will be taken through the Plan are:

(10) Improved waste water treatment: €1.7 billion in investment by Irish Water in over 250 waste water treatment projects between 2017 and 2021. This will help

improve water quality and prevent deterioration of quality in targeted water bodies, including 'protected areas'.

(11) Conservation and leakage reduction: Irish Water will implement important measures to make water use more sustainable and efficient, reducing leakage in our water network from 45% of all water produced down to 37% by 2021, based on 2017 figures.

(12) Scientific assessments of water bodies and implementation of local measures by 43 new, specialist, local authority investigative assessment personnel: they will carry out scientific assessments of water bodies and lead on local implementation measures.

(13) A new collaborative Sustainability and Advisory Support Programme: this partnership between the State and the dairy industry, consisting of 30 Sustainability Advisers, will promote best farming practice in 190 areas chosen for action, for up to 5,000 farmers.

(14) Dairy Sustainability Initiative to help improve water quality: 18,000 dairy farmers to receive advice on sustainable farming practices in the 190 areas for action.

(15) The development of water and planning guidance for local authorities: this will help local authorities to consider the risks to water quality during planning and development decision-making.

(16) Extension of the Domestic Waste Water Treatment Systems grant scheme: the scheme will assist with the costs of septic tank remediation in High Status water areas.

(17) A Blue Dot Catchments Programme: the new programme will create a network of excellent river and lake areas. Agencies will work together to protect or restore excellent water quality in these water bodies.

(18) A new Community Water Development Fund: this will enable and support community water initiative

As the implementation of the RBMP, under the WFD, ramps up more resources are being allocated by the state for example in the 6th of November 2018 30 Agricultural Sustainability Advisors have being employed by the state to address the 50% of waters at risk of not meeting their ecological "Good" target by 2027 however this is not relevant to the proposed project. The EPA Q values are more pertinent regarding empirical evidence when completing the AA process which is ratified by the detailed conservation

objectives which make specific reference to the Q values when considering potential impacts on species. Neither the surface water nor the ground water is not considered an “Area for Action” under the NRBMP with the ground water considered “Good” and “not at risk” and the surface water considered “High” and “not at Risk”. The proposed development will install storm water soak pits and is to connect to the Curry WWTp which has excess capactity to deal with the additional loading.

From the above it can be deduced that the proposed development will not contravene either the 2006 Nitrates Regulations or the River Basins Management Plan with respect to water quality.

The Birds and Habitats regulations (September 2011) dictate a number of invasive species, and native species which are subject to restrictions (see appendix F). Given that the Natura site to the West is predominantly aquatic it is necessary to prohibit the construction of any ponds on site to ensure compliance with the regulation. Further to this none of the species that are listed in the appendix may be introduced for the purposes of recreation or landscaping.

The National Biodiversity action Plan 2017-2021 and Irelands obligations under the UN Convention on Biological Diversity were consulted in the preparation of this report. While the proposed development does not have a positive impact on the objectives as laid out in the fore mentioned documents neither does it contravene any of those objectives either directly or indirectly. Therefore with respect to planned or contemplated nature conservation plans, initiatives or policy the proposed development is considered neutral.

In an international context (UN convention) according to the Third Global Biodiversity Outlook, issued by the Convention on Biological Diversity in 2010, there are many indications that biodiversity continues to decline throughout the world. These include:

- Species that have been assessed for extinction risk are on average moving closer to extinction. Amphibians face the greatest risk and coral species are deteriorating most rapidly in status. It is estimated that nearly a quarter of the world's plant species are threatened with extinction.
- The abundance of vertebrate species, based on assessed populations, fell by nearly a third on average between 1970 and 2006, and continues to fall globally.
- Natural habitats in most parts of the world continue to decline in extent and integrity, although there has been significant progress in slowing the rate of loss for tropical forests and mangroves, in some regions. Freshwater wetlands, sea ice habitats, salt marshes, coral reefs, seagrass beds and shellfish reefs are all showing serious declines.
- Extensive fragmentation and degradation of forests, rivers and other ecosystems have also led to loss of biodiversity and ecosystem services.
- Crop and livestock genetic diversity continues to decline in agricultural systems.
- The five principal pressures directly driving biodiversity loss (habitat change, overexploitation, pollution, invasive alien species and climate change) are either constant or increasing in intensity.
- The ecological footprint of humanity exceeds the biological capacity of the Earth by a wider margin than at the beginning of the Millennium.

Ireland's new National Biodiversity Plan contributes to the major concerted international effort conducted by the United Nations Convention on Biological Diversity to halt biodiversity loss

and maintain vital ecosystem services across the globe.

More specifically Irelands main obligations under the UN Convention on Biological Diversity are,

Ireland, as a contracting party to the Convention, is committed to measures to conserve biodiversity under the following themes:

- Conservation of ecosystems, habitats and species in their natural surroundings, both inside and outside protected areas (in situ conservation)
- Conservation of the components of biological diversity outside their natural habitats (ex situ conservation)
- Impact assessment
- Identification and monitoring
- Sustainable use of ecosystems, species and other biological resources
- Adoption of incentive measures
- Research and training
- Public awareness and education
- Policies and mechanisms for equitable sharing of benefits of genetic resources
- Facilitating access and transfer of technology
- Exchange of information
- Technical and scientific cooperation
- Access to and safe use of biotechnology
- Provision of financial resources to achieve the Convention's objectives, both nationally and to developing countries
-

**The 2021 Biodiversity Target**

In 2002, the Parties to the Convention, including Ireland, committed themselves to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national levels as a contribution to poverty alleviation and to the benefit of all life on Earth. This target was subsequently endorsed by the World Summit on Sustainable Development and the United Nations General Assembly and was incorporated as a new target under the Millennium Development Goals.

In 2009, the European Environment Agency (EEA) produced the first indicator-based assessment of progress towards the European 2010 Biodiversity Target and concluded that the target would not be achieved. The main conclusions from this report were:

- Some progress has been made towards halting biodiversity loss in Europe. Overall, however, the status of most species and habitats still gives rise to concern. Some threats to biodiversity have decreased while others, such as alien invasive species, remain.

- Water quality has generally improved in fresh waters and is stable in the seas, but overexploitation of marine fisheries remains a threat to the marine ecosystem. Urban sprawl and abandonment of agricultural land are putting pressure on natural and semi-natural areas. The impact of climate change is becoming

more apparent. For example, more species of birds are negatively impacted by climate change than are positively affected.

- The status of freshwater systems in general is improving and the marine environment is stable, while forest cover is still slightly increasing.

- The timber harvest from European forests generally is sustainable but a stronger biodiversity focus is needed. Agriculture still exerts a high pressure on the environment despite agricultural mitigation measures and increasing organic farming. In marine systems many fishery resources are still not being used sustainably, with some 45 % of assessed European stocks falling outside safe biological limits.

- Europe is unable to meet its consumption demands sustainably from within its own borders: demand exceeds the total capacity for biological production and absorption of waste, and this gap between demand and biocapacity has been growing progressively since 1960. Furthermore, pressures that occur outside Europe but have an impact in Europe (e.g. on migratory bird species) also need to be addressed.

Ireland, as a member of the European Union, contributes to EU-wide efforts to conserve biodiversity in the continent. Since Ireland's policies and legislation relating to biodiversity are strongly influenced by the EU, the new National Biodiversity Plan has to address not just national but also wider European issues.

The National Biodiversity Plan is not a stand-alone document. There are important relationships between this Plan and other national and international strategies and plans, including:

- United Nations Convention on Biological Diversity, under the auspices of which this Plan has been prepared, and the EU Biodiversity Action Plan;

- European Sustainable Development Strategy and Ireland's National Sustainable Development Strategy;

- United Nations Framework Convention on Climate Change, the Kyoto Protocol and Ireland's National Climate Change Strategy;

- Ireland: National Development Plan 2014-2020;

- National policies and plans for spatial planning, agriculture, forestry, fisheries, extractive industries, transport, tourism and overseas development.

Government departments and State agencies representing all the relevant sectors were consulted on a series of draft action points in advance of the preparation of this Plan, in parallel with the public consultation process.
Emanating from the above the National Biodiversity Action Plan 2017 – 2021 has identified threats and trends to Irelands biodiversity.
Ireland has a comparatively low diversity of flora and fauna compared with continental Europe because of its geographic isolation. Despite this, many of our habitats are internationally important

due to their scarcity elsewhere in Europe and the unique species communities found within them.

The vastly improved collection of data on biodiversity in the last decade has allowed us to build up a more accurate picture of the major pressures and threats to Ireland's biodiversity. These are similar to those faced by many other European countries and comprise direct damage, over-grazing, unsustainable exploitation (such as over-fishing), pollution and invasion by alien species. Pressures from agriculture and commercial afforestation have reduced slightly in the last few years, and pressures from housing and infrastructural development have also declined since the economic recession began in 2008. Despite the overall improvement in water quality for the period 2004-2006, deterioration in the highest water quality waters is the major threat to biodiversity in freshwater ecosystems. The over-fishing of marine fish species is a major cause for concern and is being addressed at both national and EU levels.

Most pertinent to this NIS are Objectives 4 and Objectives 5 of the National Biodiversity Plan and these objectives ore outlined below.

OBJECTIVE 4: TO EXPAND AND IMPROVE ON THE MANAGEMENT OF PROTECTED AREAS AND LEGALLY PROTECTED SPECIES

HEADLINE TARGET: Biodiversity loss of the most important habitats and species halted by 2015, these habitats and species showing substantial recovery by 2020.

TARGET: Natura 2000 network established, safeguarded, designated by 2012 (2014 for marine SPAs) and under effective conservation management by 2015

Complete identification and notification of SACs and SPAs, their transmission to the European Commission and formal designation, in particular for marine coastal and offshore SACs by 2012 and SPAs by 2014.

Prepare and implement site specific conservation objectives, management advice and /or plans with particular reference to Natura 2000 sites, Nature Reserves and National Parks in consultation with affected landowners and the public by 2013

Provide and implement guidelines for Local Authorities and other planning bodies on the protection of species listed in Annex IV of the Habitats Directive

Work with the EU Commission to ensure that the Community funding instruments are used to ensure adequate financing for Natura 2000; identify national priorities for co-financing; develop national programmes for allocation of financing; disburse funds (national and Community) to beneficiaries; monitor cost effectiveness of actions financed (in terms of biodiversity outcomes); audit expenditure.

TARGET: Sufficiency, coherence, connectivity and resilience of the protected areas network substantially enhanced by 2015 and further enhanced by 2021

By 2015, review previously proposed Natural Heritage Areas and designate as appropriate under the Wildlife (Amendment) Act, 2000. Elaborate and publish a framework for the selection and designation of future Natural Heritage Areas, taking into account the views of interested parties.

By 2015 strengthen the coherence, connectivity and resilience (including resilience to climate change) of the protected areas network using, as appropriate, tools that may include fly ways, buffer zones, corridors and stepping stones (see also related actions in 3.5).

TARGET: No protected habitats or species in worsening conservation status by 2015; majority of habitats or species in, or moving towards, favourable conservation status by 2020

Cease turf cutting on raised bogs in line with Government decision of 2010.

By 2015 implement existing species action or management plans for species under threat and review and update as necessary; elaborate and implement additional species action or management plans for a wider range of species under threat; ensure monitoring of implementation and effectiveness of plans.

Continue to implement programme of measures to improve the status of habitats and species assessed as "bad" in the 2007 report under to the EU on the status of protected habitats and species, involving habitat action plans if necessary, and by 2015 have in place a full prioritised programme of work.

By 2012 identify and subsequently fill critical gaps in ex-situ conservation programmes for wild species, in line with best practice.

Ensure that agri-environmental schemes provide targeted and costed prescriptions that will ensure favourable conservation status in farmed designated sites.

OBJECTIVE 5: TO CONSERVE AND RESTORE BIODIVERSITY AND ECOSYSTEM SERVICES IN THE WIDER COUNTRYSIDE

HEADLINE TARGET: In the wider countryside biodiversity loss reduced by 2015 and showing substantial recovery by 2020.

TARGET: Optimise use of opportunities under agricultural, rural development and forest policy

Develop measures in the 2014-2020 National Rural Development Plan for the protection and enhancement of ecosystem services and biodiversity

Define criteria in order to identify High Nature Value areas, develop measures to address threats

Ensure effective implementation of cross-compliance, statutory management requirements and forest service guidelines/requirements to ensure conservation of biodiversity.

Conduct a systematic evaluation process for any agri-environmental schemes delivered, involving a robust monitoring programme.

Review the control of overgrazing and undergrazing using a) Commonage Framework Plans and b) other appropriate measures.

Continue to promote the native Woodland Scheme which features establishment and conservation elements aimed at encouraging the development and conservation of native woodlands.

Consider alternative forestry management options which aim to deliver additional multiple forestry benefits.

Strengthen measures to ensure conservation, and availability for use, of genetic diversity of crop varieties, livestock breeds and races, and of commercial tree species in and promote in particular their in situ conservation.

All public bodies will endeavour to use native species, landraces and breeds and the public will beencouraged to do so.

Maintain the current NPWS farm plan scheme but explore options for migrating it to a higher tier in a DAFF agri-environmental scheme.

TARGET: Substantial progress made towards 'good ecological status' of freshwaters by 2015

TARGET: Principal pollutant pressures on terrestrial and freshwater biodiversity substantially reduced by 2015

Ensure implementation of operational monitoring programmes, publication of River Basin Management Plans and establishment and implementation of River Basin District Programmes of Measures, in line with provisions of the Water Framework Directive.

Continue investment in Water Service Investment Programme.

Significantly reduce pollutant pressures on terrestrial and freshwater ecosystems through implementation of relevant EU Thematic Strategies and Directives (e.g. Water Framework Directive, Sustainable Use of Pesticides and Nitrates).

Biodiversity loss and optimise biodiversity gains, by 2021,

Ensure Flood risk management plans for each river basin optimise benefits for biodiversity through the maintenance and/or restoration of floodplains, the promotion of sustainable land use practices and the improvement of water retention as well as the controlled flooding of certain areas as far as possible.

Continue to ensure that all significant drainage, including both initial drainage and maintenance drainage, will require assessment of its implications for biodiversity and particularly for wetlands.

TARGET: Control of harmful invasive alien species and reduced risk of spread of new species

Prepare, by 2011, detailed species and pathway risk assessments and develop exclusion and contingency plans for priority pathways and high impact species that are likely to invade Ireland.

Continue and enhance measures for eradication, where feasible, control and containment of invasive species.

TARGET: To ensure effective hedgerow and scrub management by 2015

Review options on regulation of hedgerow and/or scrub removal and produce guidelines on hedgerows/scrub biodiversity, which would, inter alia, encourage best practice for hedgerow/scrub management for wildlife throughout the country and ensure that appropriate sanctions for unauthorised removal of hedgerows/scrub are applied.

TARGET: Rehabilitation or restoration of biodiversity elements
Identify areas of biodiversity value, or biodiversity hotspots, within Bord na Mona lands by 2015.
Develop habitat maps and rehabilitation plans for all Bord na Mona bog areas by 2015.
By 2015 create a network of biodiversity areas within Bord na Mona sites.
Continue the programme of re introduction of large raptors.

Minimise soil sealing, sustain soil organic matter and prevent soil erosion through timely implementation of key measures in the forthcoming Thematic Strategy for soil protection.

Continue to increase the native woodland cover by 30%.

Develop, adopt and implement restoration programmes for salmon, sea trout and eels.

TARGET: Improve legislation and enforcement by 2021

Prepare and enact a consolidated Wildlife Act by 2021

By 2013 introduce legislation to provide a legal basis for National Parks (and other heritage properties) and, if necessary, introduce a National Parks and Heritage Properties Bill.

Introduce legislation to substantially reduce the risk to wildlife caused by the use of poisons in the environment.

Introduce revised forest legislation which will support the conservation, protection and sustainable management of forest biological diversity.

Include in the Birds and Habitats Regulations measures to prevent the import, movement, sale, distribution or release of invasive alien species, while advising on species considered safe alternatives.

Enhance the role of An Garda Siochana and Customs in enforcing Wildlife legislation, through, among other actions, the provision of specific training and guidance.

Ensure adequate training in Wildlife Crime detection and enforcement is provided to all NPWS enforcement staff. NPWS enforcement staff will investigate along with An Garda Siochana and Revenue (Customs) officials (as appropriate) suspected and alleged wildlife crime affecting biodiversity.

In addition to the following Directives, policies, legislation and plans were also considered.

(i) Bathing Waters Directive
(ii) Birds Directive
(iii) Habitats Directive
(iv) Drinking Waters Directive
(v) Major Accidents and Emergencies Directive
(vi) Phosphate Regulations
(viii) Sewage Sludge Directive
(ix) Urban Waste Water Treatment Directive
(x) Plant Protection Products Directive
(xii) Nitrates Directive
(xiii) Integrated Pollution Prevention Control Directive
(xiv) Freshwater Pearl Mussel sub-basin plan
(xv) Species Actions Plans (NPWS)
(xvii) Conservation Objectives
(xviii) Shellfish Pollution Reduction Plan
(xxiv) Sligo County Council County Development Plan 2017 – 2023

It was determined that the proposed project would not contravene or conflict with the policies or objectives of any of the above provided the precautionary mitigation measures are implemented.

The ecological survey in the appendix explores the potential objective, targets and plans for the Corn Crake.

# 7 MITIGATION MEASURES / COMPENSATION MEASURES

## 7.1 Introduction

The mitigation measures are segregated into (I) Construction and (ii) habitation / use. This is essential to facilitate the Local Authority in conditioning certain activities for each phase of the development should planning permission be granted. It should be noted that the conditioning of any of the mitigation measures puts those measures on a legally enforceable footing.

**Construction**

(1) The site boundary shall be fenced with no activity permitted out side of it.

(2) No material may be removed from or deposited in the adjacent Natura site as a result of the project which will be entirely confined to the planning / development site area..

(3) No maintenance of heavy plant shall occur on site with all preventative maintenance carried out prior to entry to the site.

(4) Refuelling of heavy plant shall only occur as necessary with no hydrocarbons stored on site

(5) Storm water from paved areas shall be diverted to a soak pit and shall not be discharge to any drain or water course.

(6) Batch concrete trucks are prohibited from the washing out of the drum on site.

(7) Aggregates to be used in construction (sands, gravels, crushed stone) shall not be stored within 50M of any watercourse, drain or stream.

(8) A water tight container must be provided on site to accept empty packaging from cement, lime, bonding, grout and skim.

(9) A separate water tight container shall be provided to accept empty containers that would have contained liquids involved in construction such as mortar mix, paints, thinners, wood preservatives, paints, water proofers, bonding, varnish, (please note this list is not exhaustive). (9)

(10) Excavated material shall not be stockpiled on site but should landscaped and reseeded immediately.

(11) All chemicals such as water proofers, thinners, wood preservatives , mortar mix etc shall be retained in a specific bunded area or storage unit with aliquots removed as necessary.

(12) All empty packaging shall be stored in appropriate containers for disposal as required.

(13) Where OFCH is utilised the tank shall be bunded to 110% of the volume of the tank and roofed. There shall be no outlet at the base of the bund. Alternatively double skinned tanks may be used.

(14) The quarry used for the supply of aggregates shall be free from invasive species such as the Japanese Knotweed.

(15) There shall be no tree or hedgerow removal during the nesting season.

(16) The clean aggregated for the internal road construction shall be imported and spread in a phased manner following directly behind the excavation for the internal access road in order to protect the exposed subsoil from erosion.

(17) The wooded tree line / riparian zone along the river shall be retained free form interference.

(18) No aggregates used for construction may be stockpiled within 5M of the identified drainage ditch on site.

**Occupation / Use**

(1) The construction of ponds and /or water features is strictly prohibited.

(2) Control of weeds within the recreational areas shall be performed manually. Where moss is to be controlled Sulphate of Iron only may be used (3 in 1 applications such as weed, feed and moss killer is prohibited).

(3) None of the botanical species as listed in appendix F shall be used for the purposes of landscaping.

(4) The Western boundary shall be double planted with native deciduous trees (sally & alder are preferable).

## 8. PLANNED OR CONTEMPLATED NATURE CONSERVATION

Cognisance has being taken of the All Ireland Species Action Plan for *Spiranthes romanzoffiana* and the threat response plan for otter *Lutra Lutra* and the "Framework for Corn Crake Conservation to 2022" in the report. The National Biodiversity Action Plan 2017-2021 and Irelands obligations under the UN Convention on Biological Diversity were also considered in the preparation of this report. While the proposed development does not have a positive impact on the objectives as laid out in the fore mentioned documents neither does it contravene any of those objectives either directly or indirectly.

The proposed development does not have any implications for the phosphate regulations, nitrates directive, water frame work directive and the western basins management plan. In addition the proposed development does not have any implications for the birds and habitats regulations (September 2011).

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## 9 CONCLUSIONS

The potential impacts during the construction and habitation of the proposed development have been considered in the context of the Natura 2000 sites and their conservation objectives. Provided the mitigation measures are implemented there will be no direct or indirect impacts on the River Moy SAC species (see section 6). The proposed project would not increase or exacerbate the identified threats to the SAC. The proposed project will not alter, interfere or impact on any of the key relationships that define either the function of or the structure of the Natura site. Although there is a land take from the SAC this involves low value GA1 habitat therefore the predicted impact on the natura site is anticipated to be neutral as no annexed habitat or species will be impacted. .

# 9 REFERENCES


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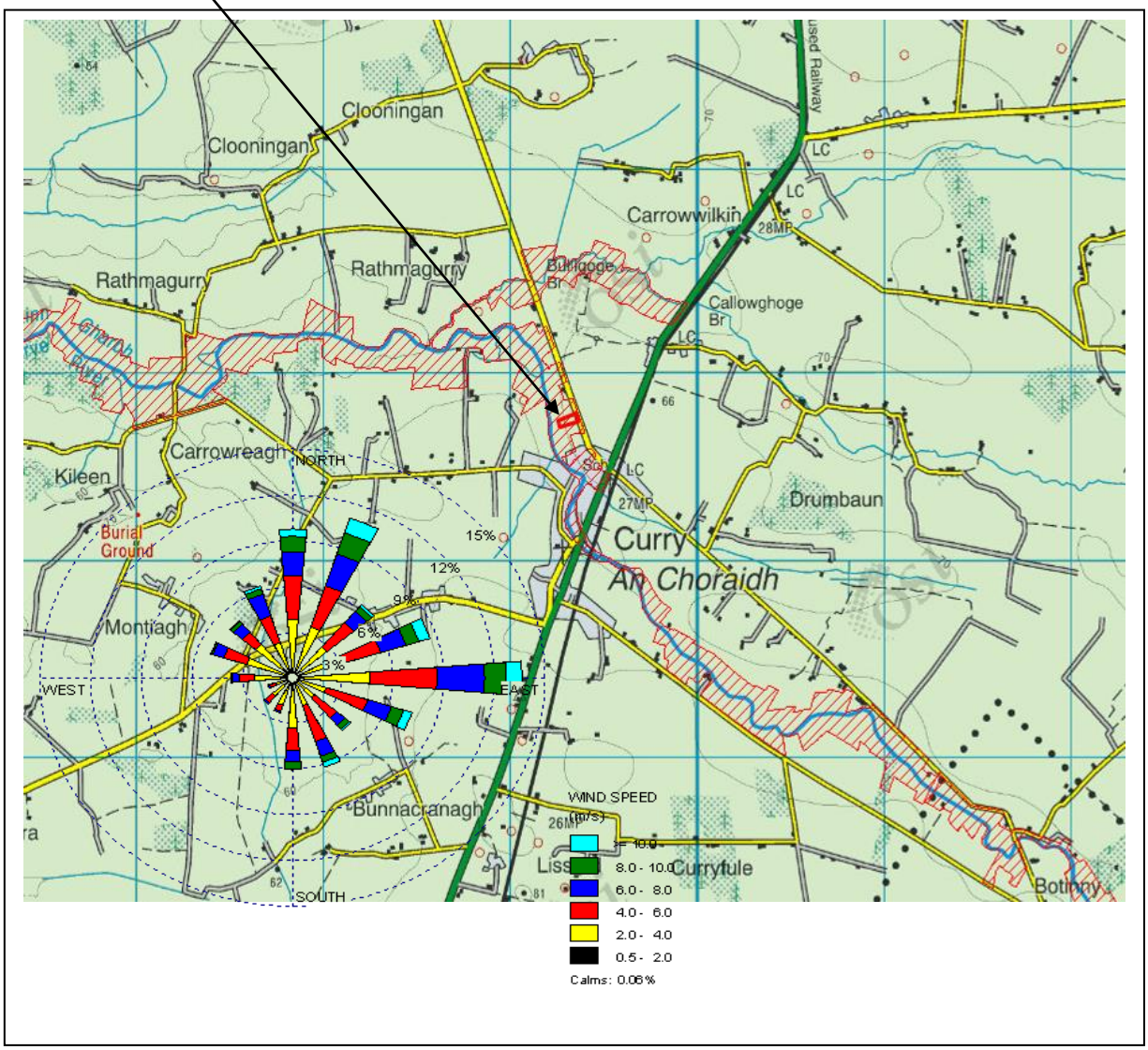
# APPENDIX A

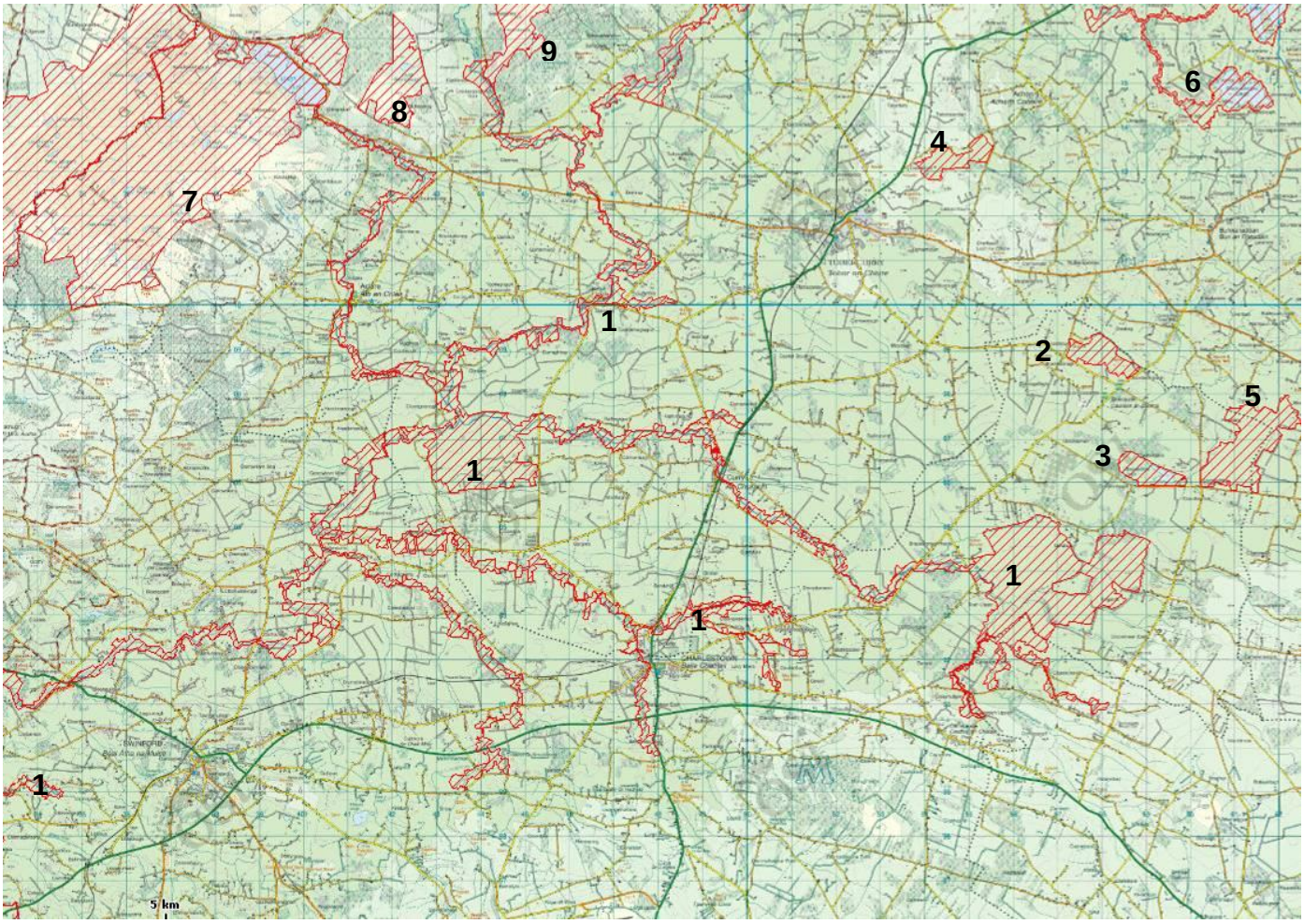
**As part of the planning process Sligo County Council would consult with NPWS. To avoid duplication consultation with NPWS will be via that mechanism.**

# APPENDIX B

**Site Location**



## Map 1a: Designated Natura sites within 15Km




**(1) River Moy SAC 002298**

**(2) Doocastle Turlough SAC 000492**

**(3) Cloonakillina Lough SAC 0001899**

**(4) Turloughmore SAC 000637**

**(5) Flughany Bog SAC 000497**

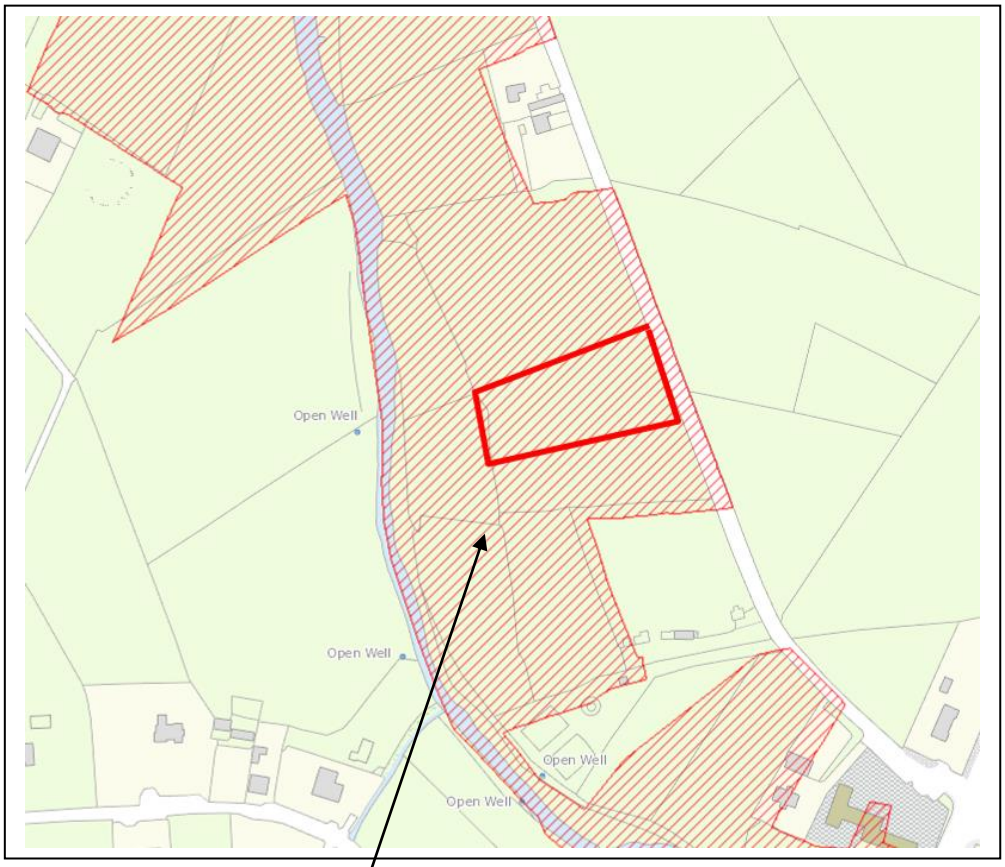
**(6) Templehouse & Cloonadeigha Lough SAC 000636**

**(7) Lough Hoe Bog SAC 00633**

**(8) Lough Nabrickkeagh Bog SAC 00634**

**(9) Ox Mountain Bog SAC 002006**

**Map 2b: proximity of site to Natura Sites**




**River Moy SAC site code 002298**

# APPENDIX C

# ECOLOGICAL SURVEY

# FOR

# THE PROPOSED

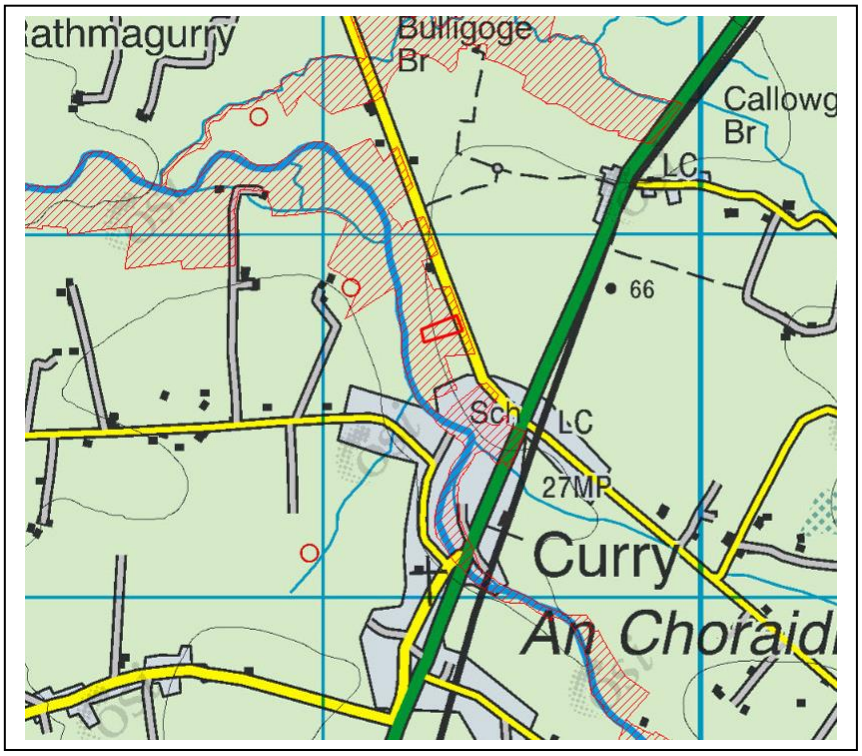
# FCONSTRUCTION OF A RESIDENTAL DWELLING HOUSE

# AT

**Drumbaun,**

**Curry,**

**Co. Sligo.**




**Client: Brendan and Aishling Brett**
**Drumbaun,**
**Curry,**
**Co. Sligo.**

**Paul Neary B.Sc. (Hns. Env. Sc.) M.Sc. (Eco. Tox)**
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**Stonehall**
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## 1.1 Site Description and desk top study

The North East facing site is located in the townland of Drumbaun with an address at Curry, Co. Sligo and is situated 267M North West of Curry National School, 265M West of the N17 Charlestown to Sligo Road, West of the Banada L4504 Road at grid reference 549292, 806719. It is located in the upper reaches of the River Moy catchment ( Moy 030 - 174.78Km$^2$ ) which includes the area drained by the River Moy and all streams entering tidal water in Killala Bay between Benwee Head and Lenadoon Point, Co. Sligo, draining a total area of 2,345km². The largest urban centre in the catchment is Castlebar. The other main urban centres in this catchment are Ballina, Tubbercurry, Kiltimagh, Swinford, Foxford, Enniscrone and Crossmolina. The total population of the catchment is approximately 77,262 with a population density of 33 people per km². The lowland parts of the catchment are underlain by various types of limestones while the upland areas from the Ox Mountains and Croaghmoyle are underlain by a band of igneous and metamorphic rocks. Much of the lowland area south of Lough Conn exhibits drumlin type topography. There are also extensive sand and gravel aquifers lying between Swinford and Charlestown to as far south as Knock, to the east of Ballina and southwest of Crossmolina. More specifically the proposed site is located in the River Moy sub catchment Moy-SC-030 i.e. the Owengarve 030 sub basin.

The underlying geology is DSL (dinantian sandstone and shales) which contains a locally important (LI) of Low (L) vulnerability and a groundwater protection response R1. The principle soil group on site is AminPDPT which are acid mineral poorly drained surface water and ground water peaty gleys. The sub soil on site are TLPSsS, till derived chiefly from lower Paleozoic sand stone and shales, with variable texture and moderate permeability over lain by well drained soil The relative risk to both groundwater and surface water considered low for N, MRP and pathogens.

The entire site is within the River Moy SAC boundary however this is tempered by the fact that the on site habitat is described as GA1 (improve agricultural grassland) with no annexed habitats types present on the site or contiguous to the site boundary. The surrounding land use and habitat type also consists of improved agricultural grassland which is subject similar levels of agricultural activity with a low density of dwellings and farm yard complexes.

There is no existing qualitative or quantitative data for ground water in the immediate area of the proposed development. The NRBMP indicate that the ground water status is “Good” and “Not at Risk” and not in a nutrient sensitive area or an Area for Action under the NRBMP. The near surface phosphate susceptibility is low with the near surface nitrate susceptibility considered moderate. Under the RBMP / WFD the surface water of the Owengarve River at this location is also considered to be of “High” status with an objective of “protect” and “not at risk” from abstraction, agriculture, domestic waste water treatment, aquaculture, forestry, urban run off, urban water discharges or hydro morphology.

The 2018 – 2021 River Basin Management plans Catchment assessment are not yet available and are currently being completed by the Environmental Protection Agency’s Catchment Science and Management Unit. On April 17th 2018 the Government published the River Basin Management

Plan for Ireland 2018-2021. The Plan sets out the actions that Ireland will undertake to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027, which is an extension to the original time frames which were prescribed under the 1st cycle WFD targets and objectives. Ireland is required to produce a river basin management plan under the Water Framework Directive (WFD) which is the overarching legislation governing this approach. The Plan provides a more coordinated framework for improving the quality of waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland. The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are considered significant. A key purpose of the River Basin Management Plan (RBMP) is to set out priorities and to ensure that implementation is guided by those priorities, which detail the approach and infrastructural requirements. The key water quality data still originates in the first phase i.e. under the WFD data sets which have yet to be updated therefore the EPA Q values are more pertinent regarding empirical evidence when completing the AA process. Currently the RBMP is essentially a green paper on water quality which will require considerable capital investment from central government if the objectives are to be achieved within the prescribed time scales however to date no such commitment has being made.

This second-cycle River Basin management Plan 2018 – 2021 aims to build on the positive aspects of the first cycle WFD, and to acknowledge and address those aspects which did not achieve the prescribed or anticipated objectives and targets. The risk assessment is based on the monitoring data for the period 2007–2015, including data on status, water quality trends and the scale of the challenges involved in meeting the environmental targets set by the WFD. Where the monitoring data indicated that there was a risk that the environmental objectives would not be achieved in respect of certain water bodies, an assessment was then carried out to identify the significant pressures impacting on that water status. The River Basin Management Plan (RBMP) sets out a range of actions aimed at moving towards the objectives of the EU Water Framework Directive (WFD). In terms of devising a strategy for implementation, it must be acknowledged that the planned actions are diverse, involve multiple stakeholders and will be implemented taking account of the available resources. Planned actions range from national measures implemented by national authorities (such as the Irish Water Capital Investment Plan and the Nitrates Action Programme) to sub-catchment management and water-body specific measures that need to be refined and implemented at a local level

This River Basin Management Plan (RBMP*)* sets out the measures aimed at protecting water bodies and addressing the pressures on those water bodies considered *"At Risk"* of not meeting the desired objectives of the Water Framework Directive (WFD). The approach adopted towards implementation centers on identifying and prioritising water bodies "for action" and ensuring effective delivery of environmental standards through a co-ordinated intervention at all levels. The River Basin

Management Plan outlines the new approach that Ireland will take to protect our waters over the period to 2021. It builds on the experience from the first planning cycle in a number of areas:

(1) Stronger and more effective delivery structures have been put in place to build the foundations and momentum for long-term improvements to water quality

(2) A new governance structure, which brings the policy, technical and implementation actors together with public and representative organisations. This will ensure the effective and coordinated delivery of measures.

(3)The newly-established Local Authority Waters and Communities Office(link is external) will help people to get involved in improving water quality at a local level. An Fóram Uisce, also newly established, is a forum for stakeholders, community groups and sectoral representatives. It will analyse and raise awareness of water issues.

An enhanced evidence base has been developed to guide national policies and the targeting of local measures. Technical assessments of 4,829 water bodies have been carried out, examining their status (quality) and whether they are 'at risk' of not meeting status objectives in the future. Using this information, the Plan sets out national policies and regional prioritised measures to ensure the specific targets are achieved.

Among the main actions that will be taken through the Plan are:

(19) Improved waste water treatment: €1.7 billion in investment by Irish Water in over 250 waste water treatment projects between 2017 and 2021. This will help improve water quality and prevent deterioration of quality in targeted water bodies, including 'protected areas'.

(20) Conservation and leakage reduction: Irish Water will implement important measures to make water use more sustainable and efficient, reducing leakage in our water network from 45% of all water produced down to 37% by 2021, based on 2017 figures.

(21) Scientific assessments of water bodies and implementation of local measures by 43 new, specialist, local authority investigative assessment personnel: they will carry out scientific assessments of water bodies and lead on local implementation measures.

(22) A new collaborative Sustainability and Advisory Support Programme: this partnership between the State and the dairy industry, consisting of 30 Sustainability Advisers, will promote best farming practice in 190 areas chosen for action, for up to 5,000 farmers.

(23) Dairy Sustainability Initiative to help improve water quality: 18,000 dairy farmers to receive advice on sustainable farming practices in the 190 areas for action.

(24) The development of water and planning guidance for local authorities: this will help local authorities to consider the risks to water quality during planning and development decision-making.

(25) Extension of the Domestic Waste Water Treatment Systems grant scheme: the scheme will assist with the costs of septic tank remediation in High Status water areas.

(26) A Blue Dot Catchments Programme: the new programme will create a network of excellent river and lake areas. Agencies will work together to protect or restore excellent water quality in these water bodies.

(27) A new Community Water Development Fund: this will enable and support community water initiative

As the implementation of the RBMP, under the WFD, ramps up more resources are being allocated by the state for example in the 6th of November 2018 30 Agricultural Sustainability Advisors have being employed by the state to address the 50% of waters at risk of not meeting their ecological "Good" target by 2027 however this is not relevant to the proposed project. The EPA Q values are more pertinent regarding empirical evidence when completing the AA process which is ratified by the detailed conservation objectives which make specific reference to the Q values when considering potential impacts on species. Neither the surface water nor the ground water are in allocation that is considered an "Area for Action" under the NRBMP.

There is an EPA monitoring station down stream from the site on the Owengarve order 4 River at Station RS34O030150 ford S of Rathmagurry Ho. which has a Q linear value of 4 and a Q legend of "Good" when last sampled in 1993.

Neither the surface water nor the ground water are considered to be under pressure from abstraction, anthropogenic activity, aquaculture, domestic waste water, forestry or invasive species. The River Moy and its tributaries are not considered nutrient sensitive and is not used for drinking water abstraction. It is governed by the EC Salmonid River Regulation 1988, SI 293 (quality of salmonid waters). The fresh water pearl muscle is not recorded in the system however the invasive Zebra muscle is present as are the North American mink.

. The air quality in the area is described as very good (zone D) which translates to the following, $SO_2$ 0-49µgM$^{-3}$ (1hr average), $NO_2$ 0-36 µgM$^{-3}$ (1hr average), $O_3$ 0-39 µgM$^{-3}$ (1hr average) and $PM_{10}$ 0-19 µgM$^{-3}$ (24hr average).

## 1.2 Plot History and Current Land Use:

The plot is currently improved agricultural grassland which is subject to bovine grazing and the associated chemical and organic fertilisers.

The proposed project involves the construction of a new 4 bed 252.10M$^2$ domestic dwelling, a 48.97M$^2$ domestic garage, connection to the public sewer, installation of storm water soak pits, connection to the public water mains and all ancillary site works on a 0.404Ha green field site. The proposed project will involve short duration light construction works of approximately <6months. The proposed project is to connect to the Curry public sewer. The existing sewer system was upgraded in circa 2000 with the treatment plant (primary settlement, aeration, filter beds) designed for a p.e. of 400. The existing loading to the system is in the order of p.e.188 and when other planning permissions, granted but not started, are taken into consideration this brings the projected loading to the WWTP to 216. This indicates that the existing Curry WWTP has excess capacity and can easily cater for the additional 6p.e. loading associated with the proposed project.

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## 1.3 ECOLOGICAL SURVEY

(see maps)

### 1.3.1 Ecological survey :

The habitat on site is classified as;

(1) Improved Agricultural Grassland (GA1)

Which is subject to fodder production / bovine grazing and chemical / organic fertilizer and the associated movement of agricultural machinery.

### 1.3.2 Botany

The plot is composed entirely of improved agricultural grassland with little diversity. Although *Juncus effusus* is abundant there is such a lack of diversity that it could not be considered a wet grassland (GS4). The fodder production / grazing regime leaves a thin short sward length.

### 1.3.3 Fauna.

There was no direct or indirect evidence of Leptis timidus, *Martes martes, Mustela erminea*, *Sciurulus vulgaris*, *Mustela lutreola, Orctyolagus cuniculus* or *Erinaceus europaeus* on site. The

reclusive *Lutra lutra* is not recorded at this location and is generally only found within 80M of suitable habitat and may be found along lake shores an driver banks however the proposed project would not impact on it with the species not recorded at this location with no proposal to alter, enter or interfere with the Owengarve Bank and no activity within 45M of it. *Sciurulus vulgaris, Mustela musculus, Martes martes* and *Orctyolagus cuniculus* would not be anticipated given the absence of suitable habitat. It would be reasonable to expect the more ubiquitous species such as *Rattus norvegicus , Apodemus sylvaticus* and *Mustela lutreola* to be present.

### 1.3.4 Avian species.

Although the normal ubiquitous species were observed no annexed avian species were recorded in the location of the proposed development nor would any be anticipated.

The Corncrake is listed on Annex I of the Birds Directive (2009/147/EC) however it is classed as 'Least Concern' by the IUCN Red List criteria.

In Ireland, on account of the large decreases in both numbers and range, it is on the Red List of Conservation Concern. The most recent assessment of Corncrakes in Ireland, submitted in Ireland's report to the EU under Article 12 of the Birds Directive, notes an 85% decrease in population since 1978 and a 92% decrease in range1.

Throughout their range in Northwest Europe, Corncrakes depend on anthropogenic agricultural activity to provide and manage habitat in a way that provides suitable cover throughout the breeding season. At all times, corncrakes require the cover of tall vegetation (>20cm) and are strongly associated with meadows which are harvested annually, where they nest and feed. Annual cutting creates a sward with an open structure, which is easy for the birds to move through, but harvesting means they must find alternative cover adjacent to meadows late in the season. Farming therefore plays a key role in the establishment, maintenance and conservation of Corncrake habitat in particular traditional hay meadow (non intensive) from early May to September.

In Ireland, adults arrive on the breeding grounds usually before meadow grass is tall enough to conceal them and so they seek cover in stands of early growing tall vegetation, such as nettles, umbellifers and reed canary grass. Depending on the prevailing climate and grassland management regime of the area, first nests may be located in this vegetation, as meadow grass may still be too short in early May. Alternatively, as soon as meadow grass is tall enough (c. 20cm in height), they can move into meadows to breed. Corncrakes are double brooded, with a peak of first hatching in early June and of second hatching in late July. The young are led away from the nest within 24 hours and are independent after about 2 weeks, but do not fledge until they are five weeks old. The consequence of this breeding schedule is that nests and females accompanying broods are present in meadows from early May until mid-August and some flightless young are still present until mid-September or later.

More intensive grassland management has also led to habitat fragmentation. Corncrakes prefer species rich, unimproved or semi-improved meadows, as improved grasses become too dense for birds to penetrate easily. It has been suggested that 150ha of relatively contiguous suitable meadow in sympathetic management is ideally required to sustain a viable population. Such blocks of habitat are rare in Ireland outside the core Corncrake areas. In addition to lack of cover in meadows at the start of the

season, Corncrakes are also often faced with a similar lack of cover after harvesting. Second brood chicks and females, who are the last to leave the breeding grounds in September, may therefore be vulnerable to predation at this time, if the cover available to them is inadequate or fragmented.

In some areas, other factors such as development pressure, abandonment of farmland or changes in grassland management regimes may have reduced the amount of suitable grassland available and this in turn may have affected Corncrake populations. Summer flooding in the Shannon Callows has been a major factor in the decline there since 2000. The species has not been recorded in the Moy valley since 1999 with no proposal to designated tha Moy Valley as an SPA. There are currently no predator control programs in the area and combined with the lack of suitable habitat the species would not use the proposed development site.

Only two avian species *Erithacus rubecula* and *Pica pica* were observed during the ecological survey however given the short sward and lack of roosting / nesting sites combined with the small plot size this would be anticipated. The species for which the SAC was designated tend to be confined to Lough Conn and Lough Cullin or the areas immediately surrounding those Lakes. The Kingfisher is not recorded as being present in the channel and was not detected during the ecological survey. If present it would only utilise the areas adjacent to the River.

### 1.3.5 Amphibians.

No amphibian species were noted during the ecological survey and given the current land use and lack of suitable habitat it is unlikely to be frequented or inhabited by such species.

### 1.3.6 Invertebrates.

No invertebrate species of note were recorded on the site. The white clawed cray fish (1092) is recorded upstream but not downstream of the site. The species requires a Q value of 3-4 at all times with disease and alien crayfish species identified as the main threats. The proposed project would not increase or exacerbated the threats with no negative impacts on water quality anticipated provide suitable environmental control measures are employed with respect to water quality.

The fresh water pearl mussel is not recorded at this location in the River Moy SAC. Data on *Margaritifera margaritifera* indicate that it is of poor status and continuing to decline across Ireland and Europe. This is attributed to sedimentation and eutrophication of habitat which impact on the ability of the species to reproduce. Reduced water quality, increased siltation and physical interference with habitat dictate that out of the remaining populations very few are actually recruiting young and at least 90% have experienced such deterioration in water quality and river bed conditions such that they may never breed successfully again.

Those factors that impact greatest on the viability of such a population are

(i) Increase in suspended solids

(ii) Introduction of exotic species

(iii) Water abstraction

(iv) Contamination with hydrocarbons, slurry, silage run off.

(v) Eutrophocation associated with chemical fertilisers

(vi) Contamination with synthetic compounds (paints, water proofers, mortar mix, sheep dip, untreated sewage ect).

(vii) Forestry

(viii) Drainage works and river modification

(ix) Industrial spills

(x) Overgrazing

(xi) Erosion

(xii) Decreases in salmon and brown trout populations (essential to the life cycle).

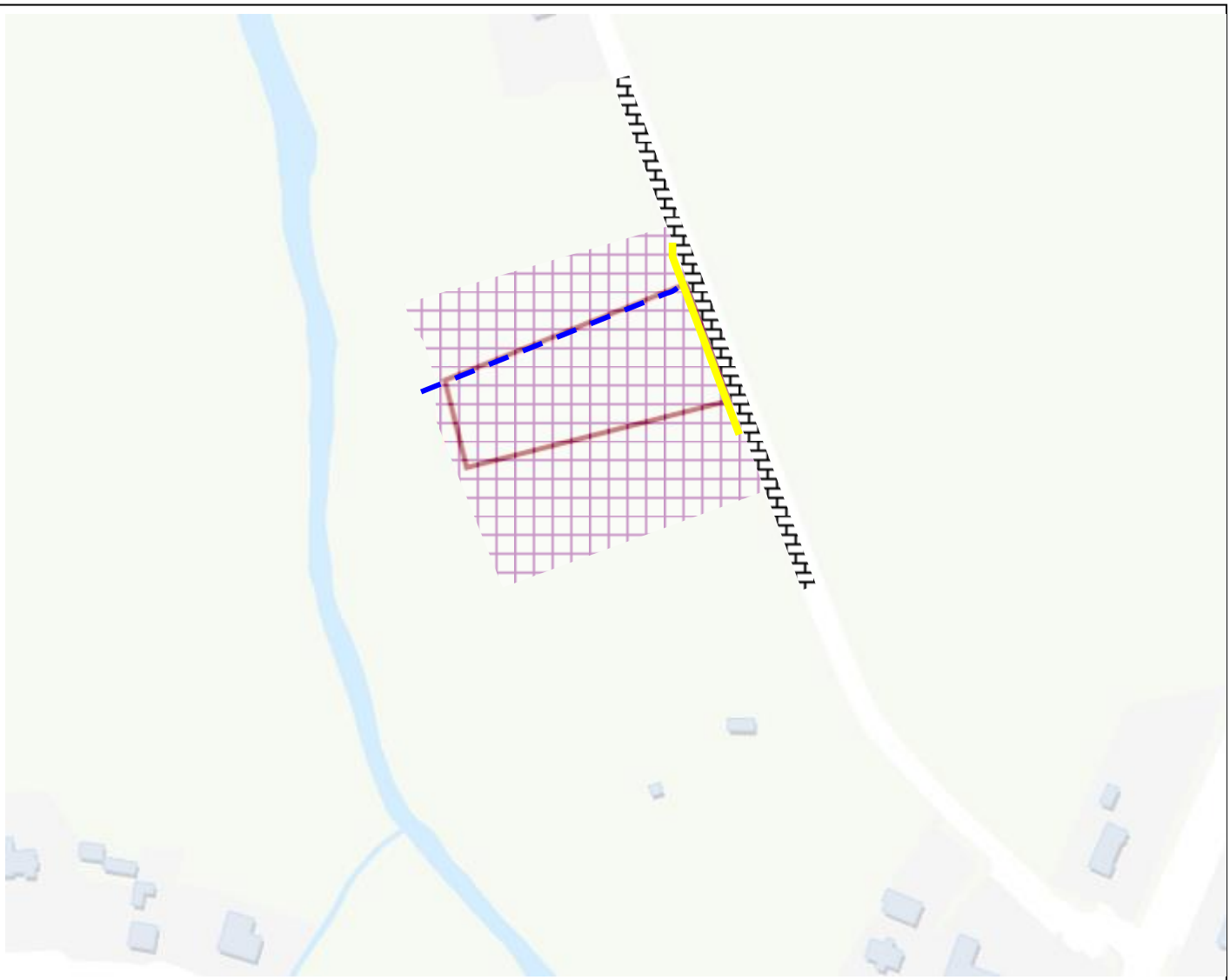
The proposed project does not involve any of the above with the bed of the River at this location not suitable for the species due to its eroding nature. In general juveniles tend to be more vulnerable than adults of 7yrs plus which tend to be more pollution tolerant and may lve for 100yrs.

No species of *Rana temporia, Bufo calamita* or *Triurus vulgaris* were observed. It would be anticipated that a low density of *Rana temporia* would utilise the site. *Bufo calamita* would not be anticipated given its extremely limited geographical distribution in Ireland.

Paul Neary B.Sc., M.Sc.
**PL321 (code 00805)

** These codes indicate that Paul Neary is an approved environmentalist by NPWS / Duchas / Dept. of Agriculture for the carrying out of ecological assessments on NHA's, SAC's, SPA's, pNHA's and National Parks and the creation of management plans and frame work plans on the afore mentioned.

**HABITAT MAP**



**Ammenity Grassland (GA2)**

**Ornamental / Non native shrubs (WS3)**

**Improved agricultural Grassland (GA1)**

**Drainage Ditch (FW4)**

**Tree Lines (WL2)**

**Buildings & Artificial Surfaces (BL3)**

## SITE PHOTOGRAPHS

# APPENDIX D

## Table 1 General characteristics of the various Biological Quality Classes

| Quality Classes | Class A | | Class B | Class C | Class D | |
|---|---|---|---|---|---|---|
| *Quality Ratings (Q)* | Q5 | Q4 | Q3-4 | Q3 | Q2 | Qi |
| *Pollution Status* | Pristine, Unpolluted | Unpolluted | Slight Pollution | Moderate Pollution | Heavy Pollution | Gross Pollution |
| *Organic Waste Load* | None | None | Light | Considerable | Heavy | Excessive |
| *Maximum B.O.D.* | Low (< 3 mg/1) | Low (< 3 mg/1) | Occasionally elevated | High at times | Usually high | Usually very high |
| *Dissolved Oxygen* | Close to 100% | 80%- 120% | Fluctuates from <80%to>120% | Very unstable Potential fish-kills | Low, sometimes zero | Very low, often zero |
| *Annual Median ortho-Phosphate* | -0.0 1 5 mg P/l | -0.030 mg P/l | -0.045 mg P/l | -0.070 mg P/l | usually > 0. 1 mg P/l | usually > 0. 1 nig P/l |
| *Siitation* | None | May be light | Maybe light | May be considerable | Usually heavy | Usually very heavy and anaerobic |
| *'Sewage Fungus '* | Never | Never | Never | May be some | Usually abundant | May be abundant |
| *Filamentous Algae* | Limited development | Considerable growths Diverse | *Cladophora* may be abundant | *Cladophora* may be excessive | May be abundant | Usually none |
| *Macrophytes* | Diverse communities Limited growths | Diverse communities Considerable growths | Reduced diversity Luxuriant growths | Limited diversity Excessive growths | Tolerant species only. Mav be abundant. | Usually none or tolerant species only. |
| *Macroinvertebrates (from shallow riffles)* | Diverse communities. Normal density. Sensitive forms usually numerous. | High diversity. Increased density. Sensitive forms scarce or | Very high diversity. Very high density. Sensitive forms scarce. | Sensitive forms absent. Tolerant forms common. Low diversity. | Tolerant forms only. Very low diversity. | Most tolerant forms. Minimal diversity. |
| *Water Quality* | Highest quality | Fair quality | Variable quality | Doubtful quality | Poor quality | Bad quality |
| *Abstraction Potential* | Suitable for all | Suitable for all | Potential problems | Advanced treatment | Low grade abstractions | Hxtremely limited |
| *Fishery Potential* | Game fisheries | Good game fisheries | Game fish at risk | Coarse fisheries | Fish usually absent | Fish absent |
| *Amenity value* | Very high | High | Considerable | Reduced | Low | Zero |

# APPENDIX E

## EVALUATION AND IMPACT MAGNITUDE TABLES

### 2.1 Ecological Site Evaluation Criteria (derived from NRA and IEEM EclA Guidelines)

| Ecological value | | Criteria |
|---|---|---|
| **Internationally important** (A sites) | | EU Annex habitat in an internationally designated conservation area (or qualifying site; or site with a proposed designation) |
| | | A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. |
| | | Non-designated high quality habitat which equates to an EU Annex I priority habitat |
| | | A regularly occurring, nationally significant population / number of any internationally important species. |
| **Nationally important** (B sites) | | EU Annex habitat in a designated (or proposed) NHA. |
| | | Non-designated good example of Annex I habitat (Under EU habitats Directive) |
| | | Any habitat which may have been formerly classified as EU Annex I quality, but which has been subsequently highly modified as a result of change in the physical environment or damaged. Such a habitat may be still be classified as an Annex habitat on the basis of the presence of one or more character plant species, but can no longer be considered a good example of that habitat type |
| **Locally important** | **High value** (C sites) | Sites containing semi-natural habitat types with high biodiversity in a local context, with high degree of intrinsic naturalness. |
| | | Locally rare habitats or species |
| | **Moderate value** (D sites) | Sites containing some semi-natural habitat or locally important for wildlife |
| | **Low value** (E sites) | Highly modified or artificial habitats with low intrinsic ecological value in terms of biodiversity |
| | | Artificial habitats which provide some secondary wildlife habitat of local value |

**NRA EcIA criteria for assessing impact magnitude**

| Impact Magnitude | Internationally important<br><br>(A sites) | Nationally important<br><br>(B sites) | High value, locally important<br><br>(C sites) | Moderate value, locally important<br><br>(D sites) | Low value, locally important<br><br>(E sites) |
|---|---|---|---|---|---|
| Profound negative | Any permanent impacts | Permanent impacts on a large part of a site | | | |
| Significant negative | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a large part of a site | | |
| Moderate<br><br>Negative | Temporary impacts on a small part of a site | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a small part of a site | Permanent impact on a site if part of a designated site |
| Slight<br><br>Negative | | Temporary impacts on a small part of a site | Temporary impacts on a large part of a site | Permanent impacts on a small part of a site | Permanent impacts on a large part of a site |
| Imperceptible Negative | | | Temporary impacts on a small part of the site | Temporary impacts on a small part of the site | Permanent impacts on a small part of a site |
| Neutral | No impacts | No impacts | No impacts | No impacts | No impacts |
| Slight Positve | | | | Permanent<br><br>beneficial impacts on a small part of a site | Permanent beneficial impacts on a large part of a site |

For ecological evaluation criteria see Table 5 above

# APPENDIX F

## THIRD SCHEDULE

### Non-native species subject to restrictions under *Regulations 49 and 50*

Part 1: PLANTS

| First column | Second column | Third column |
|---|---|---|
| Common name | Scientific name | Geographical application |
| American skunk-cabbage | *Lysichifon tnneiicunus* | Throughout the State |
| A red alga | *Gratdoupia doryphora* | Throughout the State |
| Brazilian giant-rhubarb | *Gunnera manicata* | Throughout the State |
| Broad-leaved rush | *Juncus planifolius* | Throughout the Slate |
| Cape pondweed | *Aponogeton distachyos* | Throughout the State |
| Cord-grasses | *Spartina* (all species and hybrids) | Throughout the State |
| Curly waterweed | *Lagarosiphon major* | Throughout the State |
| Dwarf eel-grass | *Zostera japoniai* | Throughout the State |
| Fanwort | *Cabomba caraliniana* | Throughout the State |
| Floating pennywort | *Hydrocotyle ratmnculoides* | Throughout the State |
| Fringed water-lily | *Nymphoides peltata* | Throughout the State |
| Giant hogweed | *Heracleum mantegazzianum* | Throughout the State |
| Giant knotweed | *Fallopia sachalinensis* | Throughout the Slate |
| Giant-rhubarb | *Gunnera tinctoria* | Throughout the State |
| Giant salvinia | *Salvinia molesta* | Throughout the State |
| Himalayan balsam | *Impatiens glanduUfera* | Throughout the State |
| Himalayan knotweed | *Persicaria wallichii* | Throughout the State |
| Hottentot -fig | *Carpobrotus edulis* | Throughout the State |
| Japanese knotwced | *Pallopia japonica* | Throughout the State |
| Large-flowered waterweed | *Egeria densa* | Throughout the State |
| Mile-a-minute weed | *Persicaria perfoliata* | Throughout the State |
| New Zealand pigmyweed | *Crassula helmsii* | Throughoui the State |
| Parrot's feather | *Myriophyllum uquaticum* | Throughout the State |
| Rhododendron | *Rhododendron ponlicum* | Throughout the State |
| Salmonberry | *Rubus spectabilis* | Throughout the State |
| Sea-buckthorn | *Hippophae rhamnaides* | Throughout (he State |
| Spanish bluebell | *flyacinthoides hispanica* | Throughout the State |
| Three-cornered leek | *Alliwn triquetrum* | Throughout the State |
| Wakame | *Unduria pirmatifida* | Throughout the State |
| Water chestnut | *Trupa ntrtans* | Throughout the State |
| Water fern | *Azolla filiculoides* | Throughout the State |
| Water lettuce | *Pistia stratiotes* | Throughout the State |
| Water-primrose | *Ludwigia* (all species) | Throughout the State |
| Waterweeds | *Elodea* (all species) | Throughout the State |
| Wire weed | *Sargassum muticum* | Throughout the State |

Part 2: ANIMALS

A: animals to which Regulations 49 and 50 apply throughout the State or in particular places or categories of places.

| First column | Second column | Third Column |
|---|---|---|
| Common name | Scientific name | Geographical application |
| A colonial sea squirt | *DJdemnum spp.* | Throughout the State |
| A colonial sea squirt | *Perophora japonica* | Throughout the State |
| All freshwater crayfish species except the white-clawed crayfish | *All freshwater crayfish species except Austropotamobius paliipes* | Throughout the State |
| American bullfrog | *Ranu catesbeiana* | Throughout the State |
| American mink | *Neovison vison* | Throughout the State |
| American oyster drill | *Urosalpinx dnerea* | Throughout the State |
| Asian oyster drill | *Ceratoslonia inornalum* | Throughout the State |
| Asian rapa whelk | *Rapana venosa* | Throughout the State |
| Asian river clam | *Corbiculu flunrinea* | Throughout the State |
| Bay barnacle | *B alarms improvisus* | Throughout the State |
| Black rat | *Rattus reams* | Offshore islands oniy |
| Brown hare | *Lepus europaeus* | Throughout the State |
| Brown rat | *Rattits norvegicus* | Offshore islands oniy |
| Canada goose | *Branta canadensis* | Throughout the State |
| Carp | *Cyprinus carpio* | Throughout the State |
| Chinese mitten crab | *Eriocheir sinensis* | Throughout the State |
| Chinese water deer | *Hydropotes inermis* | Throughout the State |
| Chub | *Leuciscus cephalus* | Throughout the State |
| Common toad | *Bufo bufo* | Throughout the State |
| Coypu | *Myocastor coy pus* | Throughout the State |
| Dace | *Leuciscus leuciscus* | Throughout the State |
| Freshwater shrimp | *Dikero gamin arus villosus* | Throughout the State |
| Fox | *Vulpes vulpes* | Offshore islands only |
| Grey squirrel | *Sciurus cnrolinensis* | Throughout the State |
| Greylag goose | *Anser anser* | Throughout the State |
| Harlequin Ladybird | *Harmonia axyridis* | Throughout the State |
| Hedgehog | *Erinaceus eiiropaeus* | Offshore islands only |
| Irish stoat | *Musteta erminea hibemiais* | Offshore islands only |
| Japanese skeleton shrimp | *Caprella mutica* | Throughout the State |
| Muntjac deer | *Muntiacus reevesi* | Throughout the State |
| Muskrat | *Ondatra zibethicus* | Throughout the State |
| Quagga Mussel | *Dreissena rostrifonnis* | Throughout the State |
| Roach | *Rutilus rutilus* | Throughout the State |
| Roe deer | *Capreolus capreolus* | Throughout the Stale |
| Ruddy duck | *Oxyuru jamaicensis* | Throughout the State |

| First column | Second column | Third Column |
|---|---|---|
| Siberian chipmunk | *Tamias sibiricus* | Throughout the State |
| Slipper limpet | *Crepidnla fornicala* | Throughout the State |
| Stalked sea squirt | *Styela clava* | Throughout the State |
| Tawny owl | *Strix aluco* | Throughout the Slate |
| Wild boar | *Sus xcrofa* | Throughout the State |
| Zebra mussel | *Dreissena polymorpha* | Throughout the State |

B: animals to which specified provisions of Regulations 49 and 50 apply.

| First column | Second column | Third Column |
|---|---|---|
| Common name | Scientific name | Geographical application |
| Fallow deer | *Dania damn* | Throughout the State |
| Sika deer | *Cervus nippon* | Throughout the State |

Part 3: VECTOR MATERIALS

| First column | Second column | Third Column |
|---|---|---|
| Vector material | Species referred to | Geographical application |
| Blue mussel *(Mytitus edulis)* seed for aquaculture taken from places (including places outside the State) where there are established populations of the slipper iimpet *(Crepiditla fornicata)* or from places within 50 km. of such places | Mussel *(Mytilus edulis)* Slipper limpet *(Crepidula fornicata)* | Throughout the State |
| Soil or spoil taken from places infested with Japanese knotweed *(Fallopia japonica),* giant knotweed *(Fallopia sachalinemis)* or their hybrid Bohemian knotweed *(Fallopia* x *bahemica)* | Japanese knotweed *(Fallopia japonica)* Giant knolweed *(Fallopia sachalinensis)* Bohemian knotweed *(Fallopia x bohcmica}h* | Throughout the State |

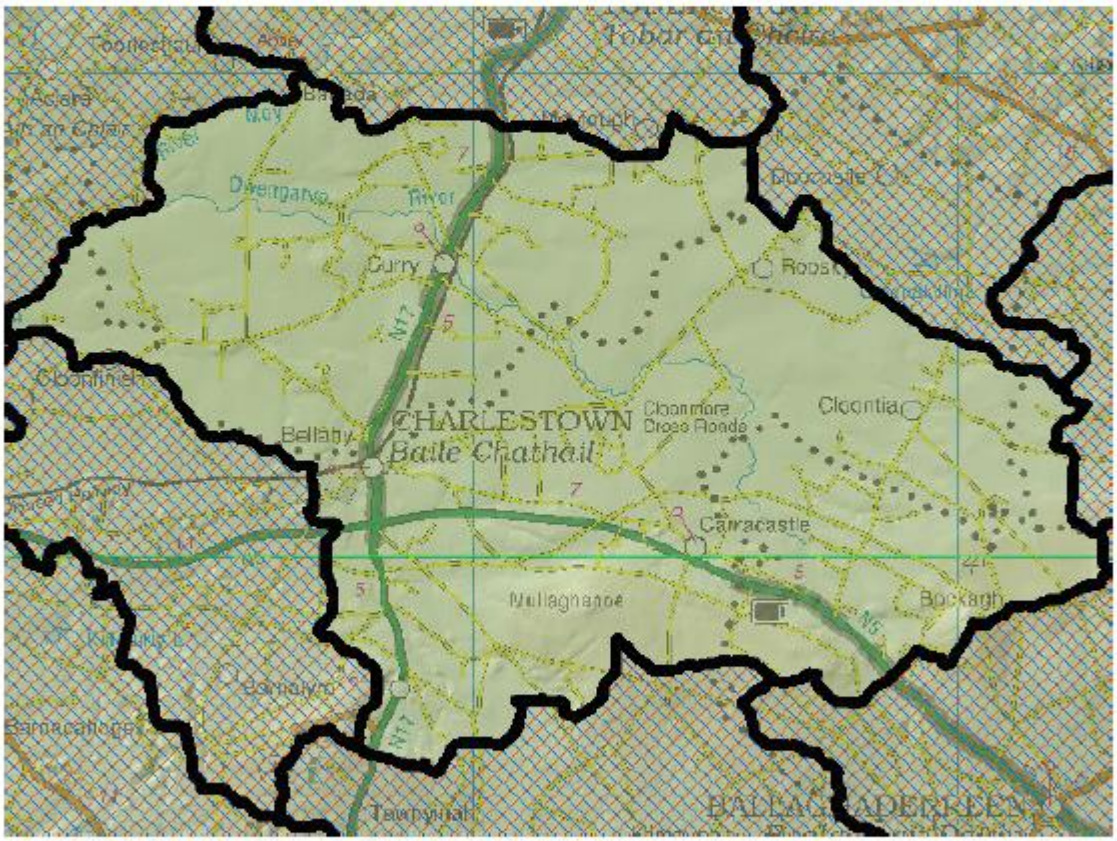
# APPENDIX G

# WFD Cycle 2

## Catchment Moy & Killala Bay

## Subcatchment Moy_SC_030

## Code 34_18






Generated on: 15 Jan 2019

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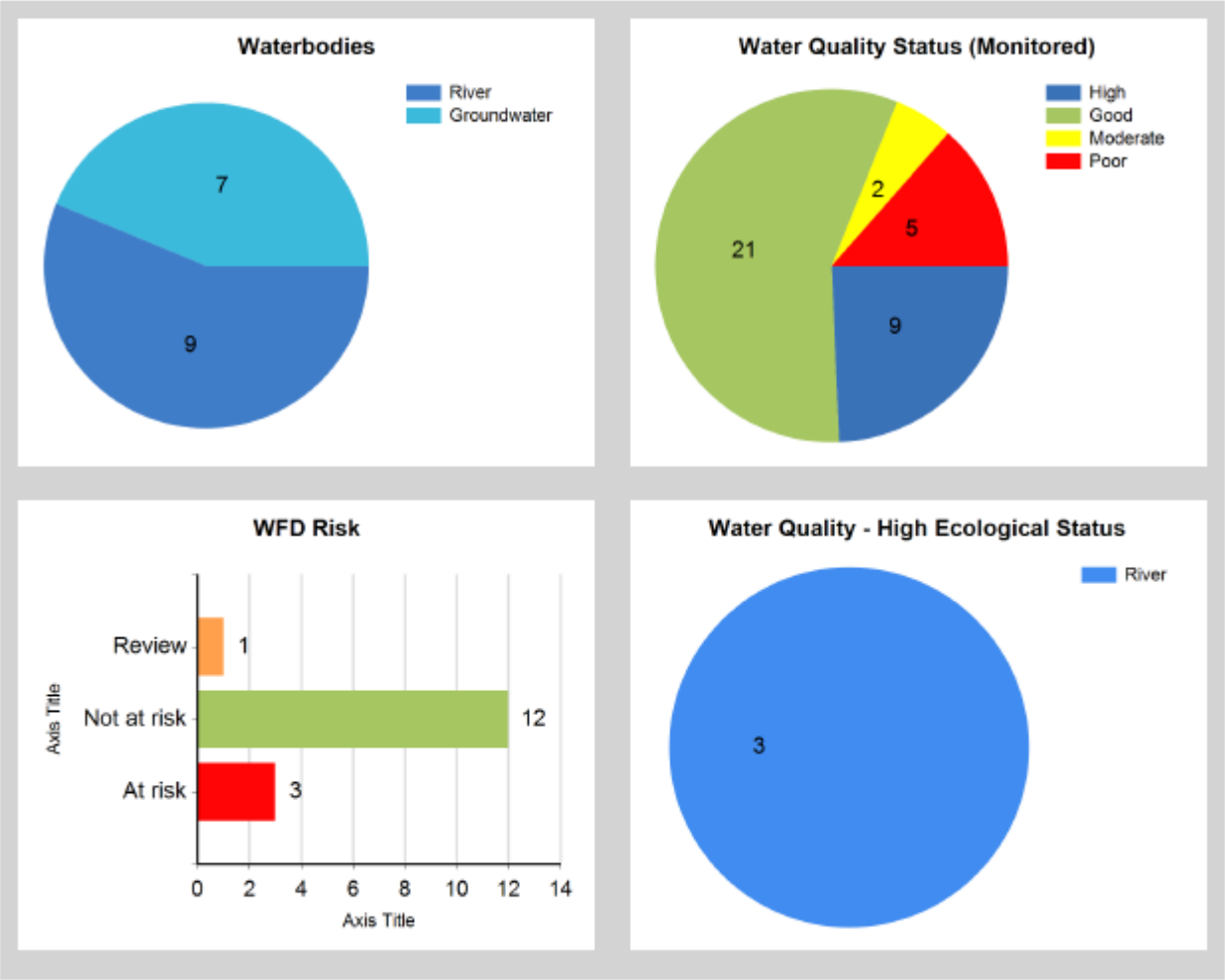
## Assessment Purpose

This assessment has been produced as part of the national characterisation programme undertaken for the second cycle of Water Framework Directive river basin management planning. It has been led by the EPA, with input from Local Authorities and other public bodies, and with support from RPS consultants.

The characterisation assessments are automatically generated from the information stored in the WFD Application. They are based on information available to the end of 2015 but may be subject to change until the final 2018-21 river basin management plan is published. Users should ensure that they have the most up to date information by downloading the latest assessment before use.



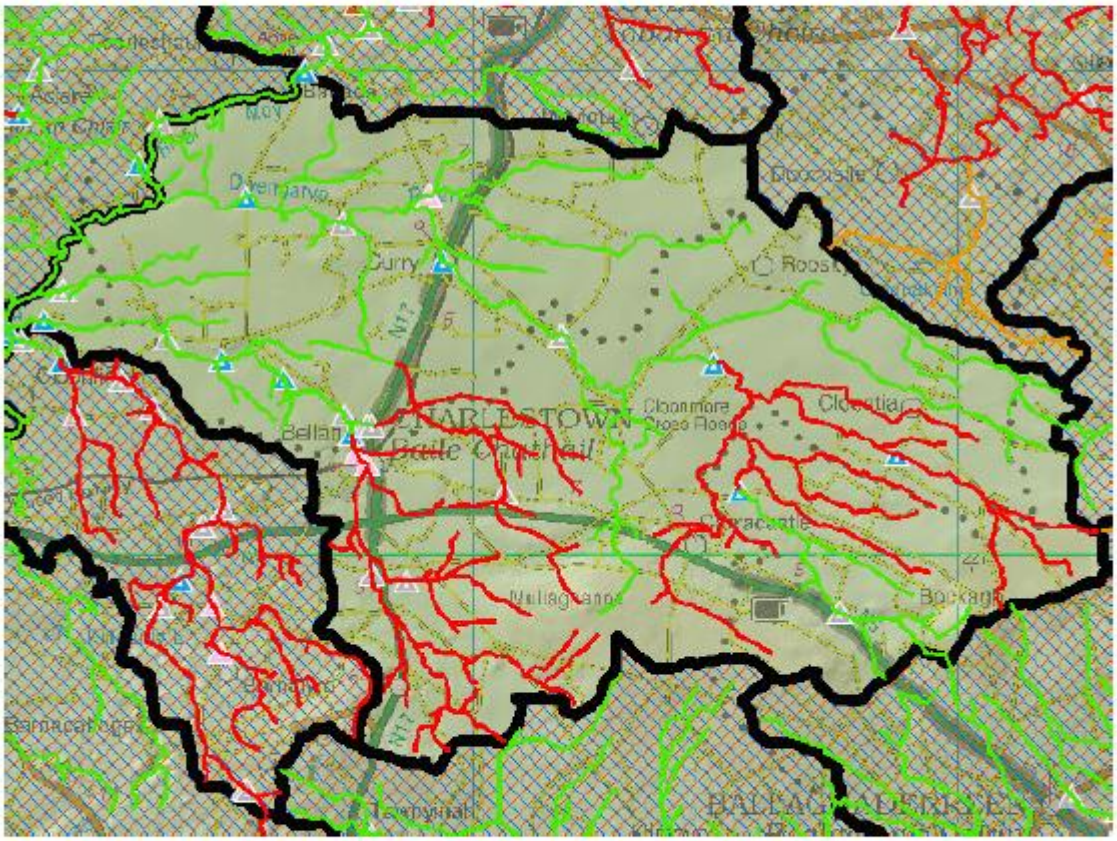
## Evaluation of PrioritySubcatchment Issues

Three of the 9 river water bodies are At Risk. Owengarve (Sligo)_010, which has High status objectives, is At Risk, as it returned Moderate status in 2013-2015. The local catchment assessment will focus on sediment and nutrient sources in the subcatchment. The two other water bodies with High status objectives, Owengarve_020 and 030 are Not at Risk, as they both returned High ecological status in 13-15.

Charlestown Stream_010, is At Risk as it returned Poor ecological status in 13-15. Following the completion of planned upgrade works of a wastewater treatment works, the water quality will be assessment to determine if it has have improved sufficiently to place this water body Not at Risk. Additional assessment of sediment pathways may be required if the improvement in water quality is not sufficient.

Black (Sligo)_010 has no chemistry data available, but Moderate ecological status is causing this water body to be At Risk. Sources of nutrients and sediment will be focused on in the local catchment assessment to determine the significant pressures.

## Map Subcatchment Risk Map

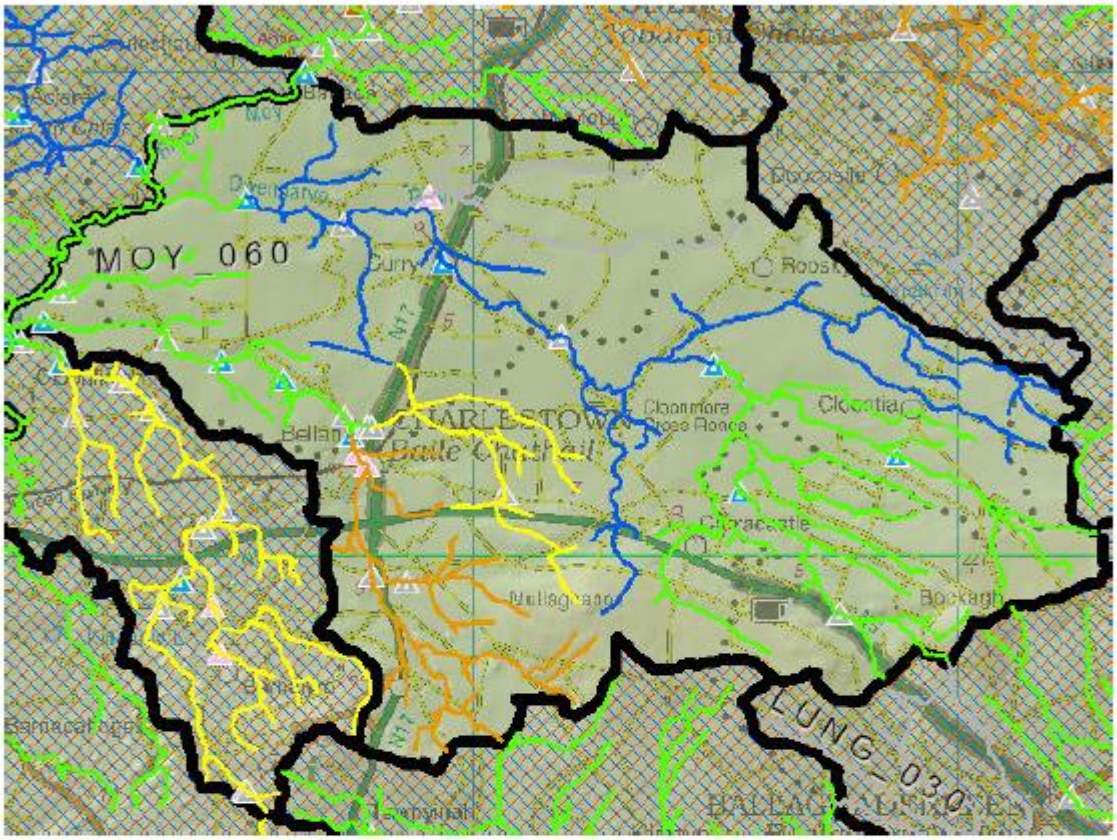


## River And Lake Waterbodies: WFD Risk

The following river and lake waterbodies are in the subcatchment.

| Code | Name | Type | WFD Risk | Significant Pressure |
|---|---|---|---|---|
| IE_WE_34B120180 | BLACK (SLIGO)_010 | River | At risk | Yes |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | River | At risk | Yes |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | River | At risk | Yes |
| IE_WE_34D360920 | DRUMBAUN_010 | River | Not at risk | No |
| IE_WE_34M020470 | MOY_060 | River | Not at risk | Yes |
| IE_WE_34M030300 | MULLAGHANOE_010 | River | Not at risk | Yes |
| IE_WE_34O030100 | OWENGARVE (SLIGO)_020 | River | Not at risk | Yes |
| IE_WE_34O030200 | OWENGARVE (SLIGO)_030 | River | Not at risk | Yes |
| IE_WE_34O040200 | OWENLOBNAGLAUR_010 | River | Not at risk | Yes |

## Map Subcatchment Water Quality Status Map




## River And Lake Waterbodies: Water Quality Status

The water quality status of river and lake waterbodies in the subcatchment is as follows.

| Code | Name | Type | 2007-09 | 2010-12 | 2010-15 |
|---|---|---|---|---|---|
| IE_WE_34B120180 | BLACK (SLIGO)_010 | River | Unassigned | Moderate | Moderate |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | River | Poor | Poor | Poor |
| IE_WE_34D360920 | DRUMBAUN_010 | River | Unassigned | Unassigned | Unassigned |
| IE_WE_34M020470 | MOY_060 | River | Good | Good | Good |
| IE_WE_34M030300 | MULLAGHANOE_010 | River | Poor | Poor | Good |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | River | High | High | Good |
| IE_WE_34O030100 | OWENGARVE (SLIGO)_020 | River | High | High | High |
| IE_WE_34O030200 | OWENGARVE (SLIGO)_030 | River | High | High | High |
| IE_WE_34O040200 | OWENLOBNAGLAUR_010 | River | High | Good | Good |

## Potentially Dependent Transitional and Coastal Waterbodies

The Transitional and Coastal waterbodies listed below intersect spatially with river and lake waterbodies in the subcatchment ...

| Code | Name | Type | Local Authority | WFD Risk |
|---|---|---|---|---|

## Potentially Dependent Groundwater Waterbodies

The groundwaters listed below interset spatially with river and lake waterbodies in the subcatchment ...

| Code | Name | Type | Local Authority | WFD Risk |
|---|---|---|---|---|
| IE_SH_G_073 | Curlew Mountains | Groundwater | Sligo County Council | Review |
| IE_WE_G_0028 | Gorteen | Groundwater | Sligo County Council | Not at risk |
| IE_WE_G_0029 | Tobercurry | Groundwater | Sligo County Council | Not at risk |
| IE_WE_G_0032 | Kilkelly Charlestown | Groundwater | Mayo County Council | Not at risk |
| IE_WE_G_0033 | Swinford | Groundwater | Mayo County Council | Not at risk |
| IE_WE_G_0037 | Ballymote | Groundwater | Sligo County Council | Not at risk |
| IE_WE_G_0108 | Swinford Gravels | Groundwater | Mayo County Council | Not at risk |

## Protected Areas intersecting River and Lake Waterbodies

The Protected Areas listed below intersect spatially with river and lake waterbodies in the subcatchment ...

| Code | Name | Type | Waterbody Name | Association Type |
|---|---|---|---|---|
| IEPA5D0025 | River Moy | Salmonid | MOY_060 | Overlapping / partly within Protected Area |
| IEPA5D0026 | Mullaghanoe | Salmonid | MOY_060 | Overlapping / partly within Protected Area |
| IEPA5D0026 | Mullaghanoe | Salmonid | CHARLESTOWN STREAM_010 | Overlapping / partly within Protected Area |
| IEPA5D0026 | Mullaghanoe | Salmonid | MULLAGHANOE_010 | Overlapping / partly within Protected Area |
| IEPA5D0028 | Owengarve | Salmonid | OWENGARVE (SLIGO)_010 | Overlapping / partly within Protected Area |
| IEPA5D0028 | Owengarve | Salmonid | OWENGARVE (SLIGO)_020 | Overlapping / partly within Protected Area |
| IEPA5D0028 | Owengarve | Salmonid | OWENGARVE (SLIGO)_030 | Overlapping / partly within Protected Area |
| IEPA5D0028 | Owengarve | Salmonid | MOY_060 | Overlapping / partly within Protected Area |

## Pressures

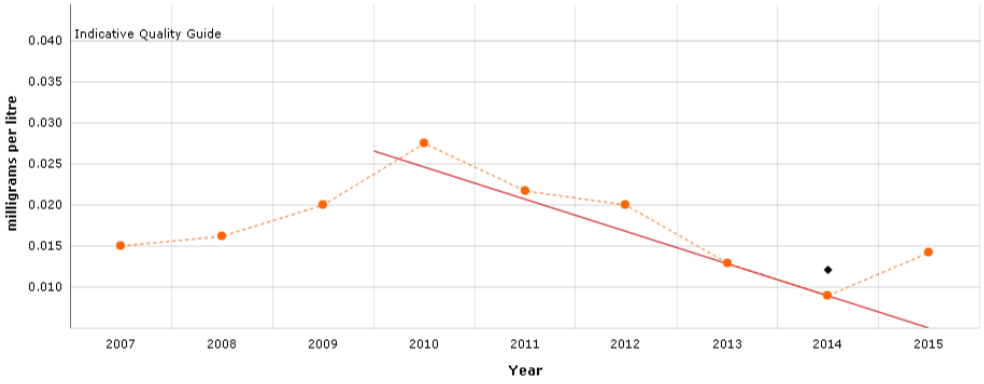
Below is a list of all significant pressures identified in the subcatchment.

| Code | Name | WFD Risk | Pressure Category | Pressure Sub Category |
|---|---|---|---|---|
| IE_WE_34B120180 | BLACK (SLIGO)_010 | At risk | Hydromorphology | Channelisation |
| IE_WE_34B120180 | BLACK (SLIGO)_010 | At risk | Agriculture | Pasture |
| IE_WE_34B120180 | BLACK (SLIGO)_010 | At risk | Hydromorphology | Land Drainage |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | At risk | Agriculture | Pasture |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | At risk | Urban Waste Water | Agglomeration PE of 1,001 to 2,000 |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | At risk | Hydromorphology | Channelisation |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | At risk | Hydromorphology | Land Drainage |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | At risk | Hydromorphology | Channelisation |
| IE_SH_G_073 | Curlew Mountains | Review | Anthropogenic Pressures | Unknown |

## Further Characterisation Actions

The following further characterisation actions have been identified. These are necessary to help understand more fully issues in the subcatchment and their likely cause.

| Code | Name | Action | Responsible Organisation |
|---|---|---|---|
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | IA1 Provision of Information | Mayo County Council |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | IA8 High status RWB pressures | Mayo County Council |
| IE_WE_34B120180 | BLACK (SLIGO)_010 | IA7 Multiple Sources in Multiple Areas | Sligo County Council |
| IE_WE_34O030050 | OWENGARVE (SLIGO)_010 | IA1 Provision of Information | Environmental Protection Agency |
| IE_WE_34B120180 | BLACK (SLIGO)_010 | IA1 Provision of Information | Environmental Protection Agency |
| IE_WE_34C280100 | CHARLESTOWN STREAM_010 | IA7 Multiple Sources in Multiple Areas | Mayo County Council |




## Trend Data

**PARAMETER**
Ammonia-Total (as N)

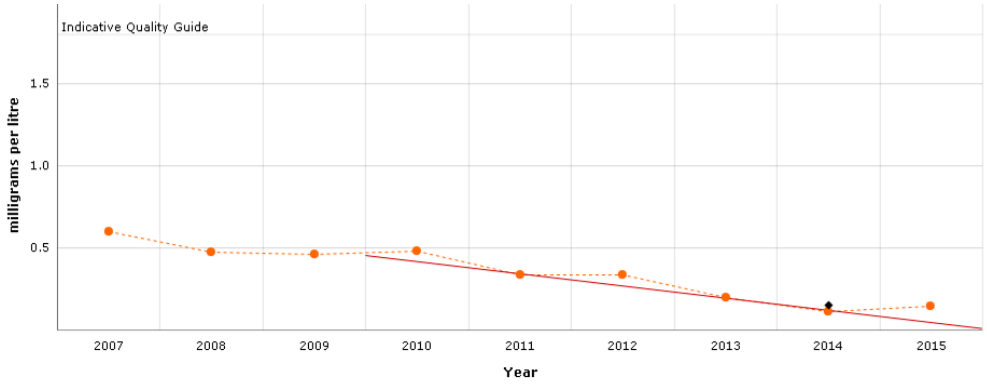
**UNIT OF MEASURE**
milligrams per litre

**INDICATIVE QUALITY**
High

**TREND**
Downwards

**SENS SLOPE**
-0.004

**SENS P VALUE**
0.060




## Trend Data

**PARAMETER**
Total Oxidised Nitrogen (as N)

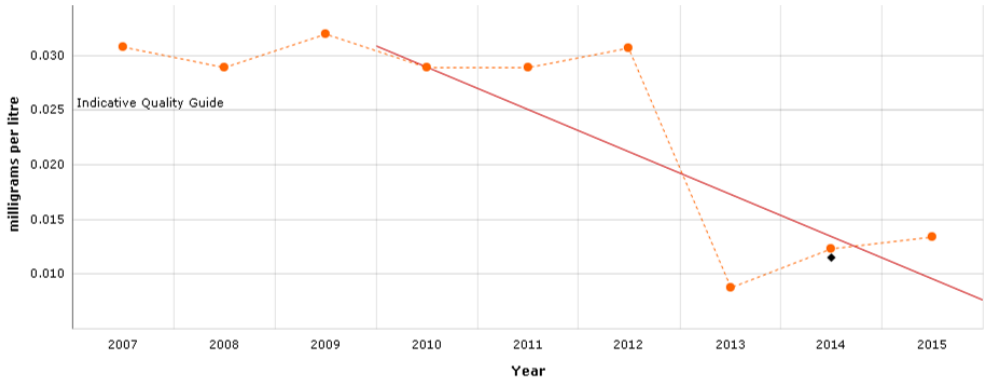
**UNIT OF MEASURE**
milligrams per litre

**INDICATIVE QUALITY**
Good

**TREND**
Downwards

**SENS SLOPE**
-0.074

**SENS P VALUE**
0.035




Trend Data

| PARAMETER | UNIT OF MEASURE |
|---|---|
| ortho-Phosphate (as P) - unspecified | milligrams per litre |
| **INDICATIVE QUALITY** | **TREND** |
| High | Downwards |
| **SENS SLOPE** | **SENS P VALUE** |
| -0.004 | 0.707 |

## SW 2010-2015

| | | |
|---|---|---|
| ▼ Ecological Status or Potential | High | |
| ▼ Biological Status or Potential | High | |
| Invertebrate Status or Potential | High | |
| ▼ Supporting Chemistry Conditions | Pass | |
| ▼ General Conditions | Pass | |
| ▼ Oxygenation Conditions | Pass | |
| Dissolved Oxygen (% Sat) | Pass | |
| Other determinand for oxygenation conditions | Good | |
| Acidification Conditions | Pass | |
| pH | Pass | |
| Nutrient Conditions | Pass | |
| Nitrogen Conditions | High | |
| Nitrate | High | |
| Ammonium | High | |
| Phosphorous Conditions | High | |
| Orthophosphate | High | |