Office of Public Works
Arterial Drainage
Maintenance Works – Killimor
Arterial Drainage Scheme

Stage 1: Appropriate Assessment Screening

July 2014

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Revision History

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
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<td></td>
<td>Nathy Gilligan, OPW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Denise Delaney, OPW</td>
</tr>
</tbody>
</table>

Contract
This report describes work commissioned by Christine McCann, on behalf of the Office of Public Works (OPW), by a letter dated 28th April 2014. OPW’s representatives for the contract were Nathy Gilligan and Denise Delaney of the OPW. Declan Egan, Tom Sampson, Laura Thomas, Aaron Birchmore of JBA Consulting carried out this work.

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Purpose
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Acknowledgements

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Executive Summary

JBA Consulting has been commissioned by the Office of Public Works (OPW) to provide environmental consultancy services in relation to statutory arterial drainage maintenance activities for 2014.

Following the methodology outlined in the Screening Methodology Report (Ryan Hanley, 2014a), this report assesses the likely significant effects on Natura 2000 sites within the zone of influence of the proposed drainage maintenance activities in the Killimor Arterial Drainage Scheme in accordance with Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).

Three source > pathway > receptor chains have been examined to assess the likely impact of drainage maintenance activities on Natura 2000 sites; surface water, land and air, and groundwater pathways.

From this screening exercise it has been determined that significant likely effects may arise on the following Natura 2000 sites as a result of OPW drainage maintenance activities in the Killimor Arterial Drainage Scheme.

<table>
<thead>
<tr>
<th>Site</th>
<th>Pathway of Impact</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardgraigue Bog SAC (002356)</td>
<td>Green</td>
<td>Drainage maintenance activities are some distance outside of the site, but still potential for adverse effects through groundwater pathways</td>
</tr>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Red</td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site, but no surface water dependent habitats/species are present so only impacts via land and air and groundwater pathways</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Red</td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site and have the potential to impact on features via all pathways.</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Red</td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site and have the potential to impact on features via all pathways.</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Red</td>
<td>Hen Harrier and Merlin may be impacted upon via land and air pathways as site with 500m of drainage maintenance activities.</td>
</tr>
</tbody>
</table>

Note:
Red = likely significant effect
Green = no likely significant effect

GIS files of the screening results by channel and embankment are supplied with this report. The attributes of these files are presented in Appendix B.

The impact of OPW drainage maintenance activities in the Killimor Arterial Drainage Scheme will therefore need to be subject to further assessment at a Stage 2 Appropriate Assessment.
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Abbreviations

COSD................................. Conservation Objective Supporting Document
DEHLG................................. Department of Environment, Heritage and Local Government
GIS................................. Geographical Information System
GWB................................. Groundwater Body
GWD................................. Groundwater Dependent
IFI................................. Inland Fisheries Ireland
IROPI................................. Imperative Reason of Overriding Public Interest
NHA................................. Natural Heritage Area
NPWS................................. National Parks and Wildlife Service
OPW................................. Office of Public Works
SAC................................. Special Area of Conservation
SPA................................. Special Protection Area
SWD................................. Surface Water Dependent
1 Introduction

1.1 Background

JBA Consulting has been commissioned by the Office of Public Works (OPW) to provide environmental consultancy services in relation to statutory arterial drainage maintenance activities for 2014.

This report provides the results of the Appropriate Assessment Screening methodology for the Killimor arterial drainage scheme. It assesses the likely significant effects on Natura 2000 sites within the zone of influence of the proposed drainage maintenance activities in accordance with Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).

1.2 Legislative Context

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of this Directive are transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also candidate sites, which form the Natura 2000 network.

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

A competent authority (e.g. the OPW or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

Under article 6(4) of the Directive, if adverse impacts are likely, and in the absence of alternative options, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (IROPI), including social or economic reasons, a Member State is required to take all compensatory measures necessary to ensure the overall integrity of the Natura 2000 site. The European Commission have to be informed of any compensatory measures adopted, unless a priority habitat type or species is present and in which case an opinion from the European Commission is required beforehand (unless for human health or public safety reasons, or of benefit to the environment).

1.3 Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). These guidance documents identify a staged approach to conducting an AA, as shown Figure 1-1.

![Figure 1-1: The Appropriate Assessment Process](from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009)
1.3.1 Stage 1 - Screening for AA
The initial, screening stage of the Appropriate Assessment is to determine:

a. whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation
b. if it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects

For those sites where potential adverse impacts are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated site, in view of the sites conservation objectives (i.e. the process proceeds to Stage 2).

1.3.2 Stage 2 - AA
This stage requires a more in-depth evaluation of the plan or project, and the potential direct and indirect impacts of them on the integrity and interest features of the European designated site(s), alone and in combination with other plans and projects, taking into account the site’s structure, function and conservation objectives. Where required, mitigation or avoidance measures will be suggested.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where mitigation cannot be achieved, then alternative solutions will need to be considered (i.e. the process proceeds to Stage 3).

1.3.3 Stage 3 - Alternative Solutions
Where adverse impacts on the integrity of Natura 2000 sites are identified, and mitigation cannot be satisfactorily implemented, alternative ways of achieving the objectives of the plan or project that avoid adverse impacts need to be considered. If none can be found, the process proceeds to Stage 4.

1.3.4 Stage 4 - IROPI
Where adverse impacts of a plan or project on the integrity of Natura 2000 sites are identified and no alternative solutions exist, the plan will only be allowed to progress if imperative reasons of overriding public interest (IROPI) can be demonstrated. In this case compensatory measures will be required.

The process only proceeds through each of the four stages for certain plans or projects. For example, for a plan or project, not connected with management of a site, but where no likely significant impacts are identified, the process stops at stage 1. Throughout the process, the precautionary principle must be applied, so that any uncertainties do not result in adverse impacts on a site.

1.4 Methodology
This screening assessment has been conducted in line with guidance produced for the OPW in 2013 (Ryan Hanley, 2013a, b and c). This methodology is based on source > pathway > receptor chain principles and involves assessing likely significant effects on Natura 2000 sites within the zone of influence of the proposed drainage maintenance in relation to three pathways:

1. Surface water
2. Land & air
3. Groundwater

The screening assessment involves assessing the impacts of drainage maintenance operations within the arterial drainage scheme, and its zone of influence, in relation to each of the three pathways individually. The results of each pathway are then combined in a concluding section to identify if/where likely significant effects may arise.
The screening process uses a combination of GIS analysis and qualitative assessment to identify which drainage maintenance activities, on which specific watercourses, are likely to have significant effects on the integrity of Natura 2000 sites.

This screening report has been produced on currently available information, with the most up-to-date versions used. Where new, or updated, information becomes available the OPW will consider and review this screening assessment if necessary.

1.4.1 Consultation
The findings of the screening assessment will be subject to consultation with the National Parks and Wildlife Service (NPWS).

Inland Fisheries Ireland (IFI) will also be consulted in relation to fisheries interests within the designated sites and watercourses/embankments where drainage maintenance activities are proposed.
2 Descriptions of Proposals – The Killimor Scheme

2.1 Background
Between 1945 and 1995, under the Arterial Drainage Act (1945), the OPW completed 34 Arterial Drainage Schemes on river catchments, along with five estuarine embankment schemes (over 11,500km of channel and 730km of embankments). The OPW is statutorily obligated to maintain arterial drainage channels under the 1945 Arterial Drainage Act, and since their completion, maintenance of these Arterial Drainage Schemes has been ongoing, with the majority of channels maintained every five years. However, larger channels tend to be only maintained every ten years, on average.

2.2 Drainage Maintenance Activities
Arterial Drainage Maintenance includes a range of operations such as silt and vegetation management, mowing and structure maintenance, as detailed in Table 2-1, and listed as channel, embankment or structure maintenance in Table 2-2 below. It is required to retain the arterial drainage scheme design capacity.

Table 2-1: OPW Drainage Maintenance Subcategories

<table>
<thead>
<tr>
<th>Drainage Maintenance Subcategories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Silt and vegetation management</td>
</tr>
<tr>
<td>B</td>
<td>Aquatic vegetation cutting</td>
</tr>
<tr>
<td>C</td>
<td>Bank protection</td>
</tr>
<tr>
<td>D</td>
<td>Bush cutting/Branch trimming</td>
</tr>
<tr>
<td>E</td>
<td>Tree cutting</td>
</tr>
<tr>
<td>F</td>
<td>Mulching</td>
</tr>
<tr>
<td>G</td>
<td>Mowing</td>
</tr>
<tr>
<td>H</td>
<td>Gate installation</td>
</tr>
<tr>
<td>I</td>
<td>Sluice maintenance</td>
</tr>
<tr>
<td>J</td>
<td>Bridge maintenance</td>
</tr>
<tr>
<td>K</td>
<td>Other</td>
</tr>
</tbody>
</table>

Table 2-2: OPW Drainage Maintenance Types

<table>
<thead>
<tr>
<th>Category</th>
<th>Maintenance Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Maintenance</td>
<td>Silt and vegetation management</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Aquatic vegetation cutting</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Bank protection</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Bush cutting/Branch trimming</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Tree cutting</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>K</td>
</tr>
<tr>
<td>Embankment Maintenance</td>
<td>Bush cutting/Branch trimming</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Tree cutting</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>Mulching</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Mowing</td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>Gate installation</td>
<td>H</td>
</tr>
<tr>
<td>Structural Maintenance</td>
<td>Sluice maintenance</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>Bridge maintenance</td>
<td>J</td>
</tr>
<tr>
<td></td>
<td>Bank protection</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Bush cutting/Branch trimming</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Tree cutting</td>
<td>E</td>
</tr>
</tbody>
</table>

Within the Killimor Arterial Drainage Scheme the exact location and type of required maintenance activity varies over time. For the purposes of this screening exercise we have therefore assumed that all activities may occur on all Scheme channels, structures and
embankments (i.e. following the precautionary principle). In terms of structural maintenance operations it is not currently known where and when maintenance will be required. Therefore, all bridges and associated structures on those watercourses screened into the assessment via each pathway are also screened into the assessment.

2.3 The Killimor Arterial Drainage Scheme

The Killimor Arterial Drainage Scheme is located in County Galway. It includes 396km of watercourse and 3.8km of embankment.

Figure 2.1: Map of the Killimor Scheme
3 Surface Water Pathways

3.1 Introduction
The following section identifies where surface water pathways may result in drainage maintenance activities in the Killimor Arterial Drainage Scheme having a significant effect on Natura 2000 sites.

3.2 Results for the Killimor Scheme

3.2.1 Level 1: Characterisation and Initial Impact Assessment
It is assumed that none of the proposed drainage maintenance activities in the Killimor Arterial Drainage Scheme are directly necessary to the nature conservation management of Natura 2000 sites.

Step 1
Each of the drainage maintenance activities detailed in Table 2-1 is proposed in the Killimor Arterial Drainage Scheme.

Step 2
There are over 250 Natura 2000 sites within the same surface water catchment and sub-catchments overlapped by the Killimor Arterial Drainage Scheme, as detailed in Table 3-1.

Of these 5 were identified as having surface water connectivity with the Scheme.

Table 3-1: Surface Water Pathway - Step 2

<table>
<thead>
<tr>
<th>Natura 2000 Site (Site Code)</th>
<th>Is site within the same surface water catchment as the scheme?</th>
<th>Is there surface water connectivity with the scheme?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ardgraigue Bog SAC (002356)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Most sites were identified as having no surface water connectivity with the Killimor Arterial Drainage Scheme and it was therefore concluded that these Natura 2000 sites cannot be impacted upon by maintenance activities within the Scheme via surface water pathways.

Five Natura 2000 sites remain within the screening assessment.

Step 3
The Qualifying Interests/Special Conservation Interests for the remaining 5 Natura 2000 sites were obtained from the relevant Conservation Objective document available from the NPWS (2014). Table 3-2 below details which of the remaining 5 Natura 2000 sites have Qualifying Interests/Special Conservation Interests which can be potentially impacted upon by surface water pathways (i.e. Surface Water Dependent (SWD) Qualifying Interests/Special Conservation Interests).
Table 3-2: Surface Water Pathway - Step 3

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Does the site contain SWD Qualifying Interests/Special Conservation Interests?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>No</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
</tr>
<tr>
<td>Ardgraigue Bog SAC (002356)</td>
<td>No</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
</tr>
<tr>
<td>Slieve Aughy Mountains SPA (004168)</td>
<td>No</td>
</tr>
</tbody>
</table>

3.2.2 Level 2: Existing Impact Assessment

Step 4

The 'At Risk' status (under the Water Framework Directive (WFD) of all surface water bodies within 5km of the Killimor Arterial Drainage Scheme was identified, as detailed in Table 3-3.

Table 3-3: Surface Water Pathway - Step 4 - WFD Risk Status of Surface Water Bodies in 5km of Killimor Arterial Drainage Scheme

<table>
<thead>
<tr>
<th>Water Management Unit</th>
<th>No. of Channels</th>
<th>Ecological Status</th>
<th>Time Period</th>
<th>Risk Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH_ShannonLower_ShannonMAIN_2Lower_1</td>
<td>4</td>
<td>Moderate</td>
<td>2021</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowMAIN_4Upper</td>
<td>8</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_LisduffMAIN_1Lower</td>
<td>11</td>
<td>Poor</td>
<td>2021</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_CappaghTRIB_1Bracklagh</td>
<td>4</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_CappaghTRIB_2Kilteskill</td>
<td>3</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowMAIN_1Lower</td>
<td>51</td>
<td>Poor</td>
<td>2021</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_LisduffMAIN_2Upper</td>
<td>25</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_Killadullisk_1</td>
<td>10</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowMAIN_2Mid</td>
<td>24</td>
<td>Poor</td>
<td>2021</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowTRIB_2Killemor</td>
<td>7</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_LisduffTRIB_1Bracklagh</td>
<td>12</td>
<td>Poor</td>
<td>2021</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowTRIB_3Abbeygormacan</td>
<td>7</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_Owenaglanna_1</td>
<td>2</td>
<td>Good</td>
<td>n/a - protect</td>
<td>Not at Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_Killoran_1</td>
<td>12</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_Shannon_12Meelick</td>
<td>1</td>
<td>Good</td>
<td>n/a - protect</td>
<td>Probably Not at Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowMAIN_3Mid</td>
<td>10</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowTRIB_1Killimor</td>
<td>4</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_CappaghMAIN_1Lower</td>
<td>23</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_DuniryMAIN_1Lower</td>
<td>4</td>
<td>Good</td>
<td>n/a - protect</td>
<td>Not at Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_DrumkearyMAIN_2Upper</td>
<td>3</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_Shannon_10Kilmalinoge</td>
<td>2</td>
<td>Poor</td>
<td>2021</td>
<td>Probably at Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_DrumkearyMAIN_1Lower</td>
<td>10</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_KilcrowTRIB_4Kiltormer</td>
<td>14</td>
<td>Good</td>
<td>n/a - protect</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_CappaghMAIN_3Upper</td>
<td>6</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
<tr>
<td>SH_ShannonLower_CappaghMAIN_2Mid</td>
<td>13</td>
<td>Moderate</td>
<td>2015</td>
<td>At Risk</td>
</tr>
</tbody>
</table>

3.2.3 Level 3: Potential Impact and Significance Assessment

Step 5

This stage determines whether there is potential for proposed drainage maintenance activities within a scheme to effect Natura 2000 site(s) within the surface water catchment; this is based on the hydrological setting (i.e. marine, estuarine, and freshwater). This is assessed from a matrix of pre-determined distances and typologies (i.e. upstream or downstream) which define
the zone of influence within which effects can potentially occur within each type of setting (Ryan Hanley, 2014a).

The results of this are summarised in Table 3-4.

### Table 3-4: Surface Water Pathway - Step 5

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Hydrological Setting</th>
<th>Drainage maintenance activity location relative to Natura 2000 site boundary</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Freshwater</td>
<td>No, &lt;3km, Yes</td>
<td>Potential Effect</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Freshwater</td>
<td>No, &lt;3km, Yes</td>
<td>Potential Effect</td>
</tr>
</tbody>
</table>

### Step 6

Relevant information relating to each of the remaining Natura 2000 sites, including the Conservation Objectives Supporting Document, Site Synopsis and Natura 2000 Standard Data Form, were then reviewed to identify the potential for pressures and threats and related cumulative and in-combination effects. The results of this assessment are detailed in Table 3-5.

### Table 3-5: Surface Water Pathway - Step 6

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressures or Threats</th>
<th>Presence of surface water pathways</th>
<th>Pressure/ or Threat Codes from Article 17</th>
<th>Potential for Cumulative Impact and In-combination Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuse pollution to surface waters due to agricultural and forestry activities</td>
<td>Yes</td>
<td>H01.05</td>
<td></td>
</tr>
<tr>
<td>Urbanised areas, human habitation</td>
<td>No</td>
<td>E01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Outdoor sports and leisure activities, recreational activities</td>
<td>Yes</td>
<td>G01</td>
<td></td>
</tr>
<tr>
<td>Invasive non-native species (Zebra Mussel)</td>
<td>No</td>
<td>I01</td>
<td></td>
</tr>
<tr>
<td>Forest and plantation management &amp; use</td>
<td>No</td>
<td>B02</td>
<td></td>
</tr>
<tr>
<td>Diffuse pollution to surface waters due to agricultural and forestry activities</td>
<td>Yes</td>
<td>H01.05</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
</tbody>
</table>
### Steps 7 and 8

These stages involved examining the SWD Qualifying Interests/Special Conservation Interests for each of the remaining 'screened in' Natura 2000 sites to identify which may potentially be impacted upon by drainage maintenance activities. This was done using a set of pre-determined buffer zones derived for each individual habitat and species, within which effects can potentially occur (Ryan Hanley, 2014a). The location of the Natura 2000 site for these stages is also important, depending on whether it is downstream, upstream or overlaps the Scheme as this situation may allow some Qualifying Interests/Special Conservation Interests to be screened out.

Information, including from the Conservation Objectives, was also reviewed to determine the location of the drainage maintenance activities relative to the SWD Qualifying Interests/Special Conservation Interests. Where no information on the location of SWD Qualifying Interests/Special Conservation Interests was available, the precautionary principle was applied and the Qualifying Interests/Special Conservation Interests were screened in.

Table 3-6 summarises the results of this stage for the remaining SACs and Table 3-7 provides the results for the remaining SPAs.

### Table 3-6: Surface Water Pathway - Steps 7 and 8 for SACs

<table>
<thead>
<tr>
<th>EU Code</th>
<th>SWD Qualifying Interest/Special Conservation Interest</th>
<th>Drainage Activity location relative to SWD Qualifying interest</th>
<th>Desktop Study Comment</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Downstream</td>
<td>Upstream</td>
<td>Overlap</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>7210 Calcereous fens with <em>Cladium mariscus</em> and species of <em>Caricion davallianae</em></td>
<td>No</td>
<td>&lt;5km</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No detailed information on location of habitat available.</td>
<td>Potential for Likely Significant Effect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7230 Alkaline fen</td>
<td>No</td>
<td>&lt;5km</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No detailed information on location of habitat available.</td>
<td>Potential for Likely Significant Effect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>91E0 Alluvial forests with <em>Alnus glutinosa</em> and <em>Fraxinus excelsior</em></td>
<td>No</td>
<td>&lt;5km</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No detailed information on location of habitat available.</td>
<td>Potential for Likely Significant Effect</td>
<td></td>
</tr>
</tbody>
</table>
Table 3-7: Surface Water Pathway - Steps 7 and 8 for SPAs

<table>
<thead>
<tr>
<th>SWD habitats present</th>
<th>Annex I Habitat</th>
<th>Special Conservation Interest likely to occur</th>
<th>Drainage maintenance activity location relative to SWD Special Conservation Interests</th>
<th>Desktop Study Comment</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lough Derg (Shannon) SPA (004058)</strong></td>
<td>Mesotrophic standing water body (FL4)</td>
<td>No</td>
<td>No</td>
<td>&lt;5km</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Step 9**

A review of the attributes and targets for the SWD Qualifying Interests/Special Conservation Interests has identified that there is potential for significant effects on Qualifying Interests/Special Conservation Interests in the following Natura 2000 sites. If there is insufficient information available then under the precautionary principle there is potential for effects based on attributes and for likely significant effects.

Table 3-8: Surface Water Pathway - Step 9

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential for Effects Based on Attributes</th>
<th>Potential for Likely Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Derg, North-East Shore (002241)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Step 10**

In conclusion, the above steps have determined that the following Natura 2000 sites will require a Stage 2 Appropriate Assessment to be undertaken and the preparation of a Natura Impact Statement. However, if more data becomes available, further site specific investigations can be undertaken and this screening conclusion re-assessed.

Table 3-9: Surface Water Pathway - Step 10

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential for Likely Significant Effects must be considered</th>
<th>Potential for Cumulative Impacts must be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Derg, North-East</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The screened in channel and embankment sections (and the bridges within these sections) in the Killimor Arterial Drainage Scheme are shown on the map below, and tabulated in Appendix B.

Figure 3-1: Channels and embankments with potential impacts via surface water pathways
4 Land and Air Pathways

4.1 Introduction
The following section of this report examines land and air pathways which may arise due to drainage maintenance activities in the Killimor Arterial Drainage Scheme. The impacts of these pathways, if any, on Natura 2000 sites is then assessed.

4.2 Results for the Killimor Scheme

4.2.1 Level 1: Characterisation and Initial Impact Assessment
It is assumed that none of the proposed drainage maintenance activities in the Killimor Arterial Drainage Scheme are directly necessary to the nature conservation management of Natura 2000 sites.

Step 1
Each of the drainage maintenance activities detailed in Table 2-1 is proposed in the Killimor Arterial Drainage Scheme.

Step 2
There are 4 Natura 2000 sites within 0.01km and 5 Natura 2000 sites located within 0.6km of the Scheme, as detailed in Table 4-1.

Table 4-1: Land & Air Pathway - Step 2

<table>
<thead>
<tr>
<th>Natura 2000 Site Name (Site Code)</th>
<th>0.6km Buffer Zone</th>
<th>0.01km (Overlap)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect impacts for noise and visual disturbance through air pathways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct impacts from physical disturbance of habitats through land pathways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ardraigue Bog SAC (002356)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Step 3
The Qualifying Interests/Special Conservation Interests for each Natura 2000 site were obtained from the relevant Conservation Objective document available from the NPWS (2014). Table 4-2 below details which of the five Natura 2000 sites identified in Table 4-1 above have Qualifying Interests/Special Conservation Interests which can be potentially impacted upon by land and air pathways.

Table 4-2: Land & Air Pathway - Step 3

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Presence of Land and Air Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardraigue Bog SAC (002356)</td>
<td>Yes</td>
</tr>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
4.2.2 Level 2: Existing Impact Assessment

Step 4
Not applicable to this pathway.

4.2.3 Level 3: Potential Impact and Significance Assessment

Step 5
This stage assesses whether there is potential for a drainage maintenance activity to effect the Qualifying Interests/Special Conservation Interests of the Natura 2000 site(s) within the zone of influence of a scheme. This is determined from a set of pre-established distances for each individual habitat and species within which effects can potentially occur (Ryan Hanley, 2014a). The results of this are summarised in Table 4-3.

Table 4-3: Land & Air Pathway - Step 5

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habits</th>
<th>Drainage maintenance activity location relative to qualifying interest/ special conservation interest</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7120</td>
<td>Degraded raised bogs still capable of natural regeneration</td>
<td>&gt;0.1km</td>
<td>N/A</td>
<td>No Impact - Screen out Natura 2000 Site</td>
</tr>
<tr>
<td>7110</td>
<td>Active raised bogs</td>
<td>&gt;0.1km</td>
<td>N/A</td>
<td>No Impact - Screen out Natura 2000 Site</td>
</tr>
<tr>
<td>7150</td>
<td>Depressions on peat substrates of the <em>Rhynchosporion</em></td>
<td>&gt;0.1km</td>
<td>N/A</td>
<td>No Impact - Screen out Natura 2000 Site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habits</th>
<th>Drainage maintenance activity location relative to qualifying interest/ special conservation interest</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7120</td>
<td>Degraded raised bogs still capable of natural regeneration</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
<tr>
<td>7110</td>
<td>Active raised bogs</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
<tr>
<td>7150</td>
<td>Depressions on peat substrates of the <em>Rhynchosporion</em></td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habits</th>
<th>Drainage maintenance activity location relative to qualifying interest/ special conservation interest</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>8240</td>
<td>Limestone pavements</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
<tr>
<td>5130</td>
<td>Juniperus communis formations on heaths or calcareous grasslands</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
<tr>
<td>7210</td>
<td>Calcerous fens with <em>Cladium mariscus</em> and species of <em>Carex</em></td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
<td>Potential Effect - Further information required</td>
</tr>
</tbody>
</table>
### Drainage maintenance activity

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habitats</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>davallianae</td>
<td></td>
<td></td>
<td>required</td>
</tr>
<tr>
<td>7230</td>
<td>Alkaline fens</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
</tr>
<tr>
<td>91E0</td>
<td>Alluvial forests with <em>Alnus glutinosa</em> and <em>Fraxinus excelsior</em> (<em>Alno-Padion, Alnion incanae, Salicion albae</em>)</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
</tr>
<tr>
<td>91J0</td>
<td><em>Taxus baccata</em> woods of the British Isles</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
</tr>
</tbody>
</table>

#### Slieve Aughty Mountains SPA (004168)

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habitats</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>A082</td>
<td>Hen Harrier <em>Circus cyaneus</em></td>
<td>0km / Overlap</td>
<td>MAC + 500m</td>
</tr>
<tr>
<td>A098</td>
<td>Merlin <em>Falco columbarius</em></td>
<td>0km / Overlap</td>
<td>MAC + 500m</td>
</tr>
</tbody>
</table>

#### Lough Derg (Shannon) SPA (004058)

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habitats</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>A193</td>
<td>Common Tern <em>Sterna hirundo</em></td>
<td>0km / Overlap</td>
<td>MAC + 100m</td>
</tr>
<tr>
<td>A061</td>
<td>Tufted Duck <em>Aythya fuligula</em></td>
<td>0km / Overlap</td>
<td>MAC + 100m</td>
</tr>
<tr>
<td>A067</td>
<td>Goldeneye <em>Bucephala clangula</em></td>
<td>0km / Overlap</td>
<td>MAC + 100m</td>
</tr>
<tr>
<td>A017</td>
<td>Cormorant <em>Phalacrocorax carbo</em></td>
<td>0km / Overlap</td>
<td>MAC + 100m</td>
</tr>
<tr>
<td>n/a</td>
<td>Wetlands and Waterbirds</td>
<td>0km / Overlap</td>
<td>MAC + 10m</td>
</tr>
</tbody>
</table>

Notes:
- MAC = Maintenance Access Corridor
- BR = Bridge
- INST = Instream

**Step 6**

Relevant information relating to each Natura 2000 site, including the Conservation Objectives Supporting Document, Site Synopsis and Natura 2000 Standard Data Form, were then reviewed to identify the potential for pressures and threats and related cumulative and in-combination effects. The results of this assessment are detailed in Table 4-4.
### Table 4-4: Land & Air Pathway - Step 6

<table>
<thead>
<tr>
<th>Natura 2000 Site (Site code)</th>
<th>Pressures or Threats</th>
<th>Presence of a Land &amp; Air Pathway</th>
<th>Pressure/ Or Threat Codes from Article 17</th>
<th>Cumulative Impact and In-combination Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barraughte Bog SAC (000231)</td>
<td>Mechanical peat-cutting Drainage</td>
<td>Yes</td>
<td>C01.03.02</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Fire damage</td>
<td>Yes</td>
<td>J01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Diffuse pollution to surface waters due to agricultural and forestry activities</td>
<td>No</td>
<td>H01.05</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Urbanised areas, human habitation</td>
<td>Yes</td>
<td>E01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Outdoor sports and leisure activities, recreational activities</td>
<td>Yes</td>
<td>G01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Invasive non-native species (Zebra Mussel)</td>
<td>Yes</td>
<td>I01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Forest and plantation management &amp; use</td>
<td>Yes</td>
<td>B02</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Diffuse pollution to surface waters due to agricultural and forestry activities</td>
<td>No</td>
<td>H01.05</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Outdoor sports and leisure activities, recreational activities</td>
<td>Yes</td>
<td>G01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Invasive non-native species (Zebra Mussel)</td>
<td>No</td>
<td>I01</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Sylviculture, forestry</td>
<td>Yes</td>
<td>B</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Sylviculture, forestry</td>
<td>Yes</td>
<td>B</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
</tbody>
</table>

**Step 7**
Not applicable to this pathway.

**Step 8**
As part of this step, further information on the following sites was collected to determine the location of drainage maintenance activities relative to the Qualifying Interests/Special
Conservation Interests of each site, to determine if they are located in or outside of the zone of influence:

- Barroughter Bog SAC (000231)
- Lough Derg, North-East Shore SAC (002241)
- Lough Derg (Shannon) SPA (004058)
- Slieve Aughty Mountains SPA (004168)

Where no information on the location of Qualifying Interests/Special Conservation Interests was available, the precautionary principle was applied and the Qualifying Interests/Special Conservation Interests were screened in, given their unknown location.

The results are given in Table 4-5 below.

<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habitats</th>
<th>Maintenance activity location relative to Natura 2000 site boundary</th>
<th>Qualifying Interest/Special Conservation Interests location relative to drainage maintenance activity</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7120</td>
<td>Degraded raised bogs still capable of natural regeneration</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>7110</td>
<td>Active raised bogs</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>7150</td>
<td>Depressions on peat substrates of the Rhynchosporion</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>8240</td>
<td>Limestone pavement</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>5130</td>
<td>Juniper scrub</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>7210</td>
<td>Calcerous fens with Cladium mariscus and species of Caricoin</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect -</td>
</tr>
</tbody>
</table>

Table 4-5: Land & Air Pathway - Step 7
<table>
<thead>
<tr>
<th>EU Code</th>
<th>Species/Habitats</th>
<th>Maintenance activity location relative to Natura 2000 site boundary</th>
<th>Qualifying Interest/Special Conservation Interests location relative to drainage maintenance activity</th>
<th>Location of Impact</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>davallianae</td>
<td>Alkaline fens</td>
<td>0km / Overlap</td>
<td>precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Further information required</td>
</tr>
<tr>
<td>7230</td>
<td>Alluvial forests with <em>Alnus glutinosa</em> and <em>Fraxinus excelsior</em> (<em>Alno-Padion, Alnion incanae, Salicion albae</em>)</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>91E0</td>
<td><em>Taxus baccata</em> woods of the British Isles</td>
<td>0km / Overlap</td>
<td>No detailed information on habitat location available. Under the precautionary principle habitat assumed to be present throughout.</td>
<td>MAC + 10m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>91J0</td>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A082</td>
<td>Hen Harrier <em>Circus cyaneus</em></td>
<td>0km / Overlap</td>
<td>No detailed information available. Under the precautionary principle species assumed to be present throughout.</td>
<td>MAC + 500m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>A098</td>
<td>Merlin <em>Falco columbarius</em></td>
<td>0km / Overlap</td>
<td>No detailed information available. Under the precautionary principle species assumed to be present throughout.</td>
<td>MAC + 500m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A193</td>
<td>Common Tern <em>Sterna hirundo</em></td>
<td>0km / Overlap</td>
<td>No detailed information available. Under the precautionary principle species assumed to be present throughout.</td>
<td>MAC + 100m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>A061</td>
<td>Tufted Duck <em>Aythya fuligula</em></td>
<td>0km / Overlap</td>
<td>No detailed information available. Under the precautionary principle species assumed to be present throughout.</td>
<td>MAC + 100m</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
<tr>
<td>A067</td>
<td>Goldeneye <em>Bucephala</em></td>
<td>0km / Overlap</td>
<td>No detailed information available. Under the</td>
<td>MAC +</td>
<td>Potential Significant Effect - Further information required</td>
</tr>
</tbody>
</table>
### Step 9

A review of the attributes and targets for the Qualifying Interests/Special Conservation Interests has identified that there is potential for significant effects on Qualifying Interests/Special Conservation Interests in the following Natura 2000 sites.

Table 4-6: Land & Air Pathway - Step 9

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential for Effects Based on Attributes</th>
<th>Potential for Likely Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Step 10

The following Natura 2000 sites will require a Stage 2 Appropriate Assessment to be undertaken and the preparation of a Natura Impact Statement or further site specific investigations, if more data becomes available.

Table 4-7: Land & Air Pathway - Step 10

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential Significant Effects must be considered</th>
<th>Likely Significant Effects must be considered</th>
<th>Potential for Cumulative Impacts must be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Natura 2000 Site

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential Significant Effects considered</th>
<th>Likely Effects must be considered</th>
<th>Potential Impacts for Cumulative Impacts must be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>(000231)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Slieve Aughy Mountains SPA (004168)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

The screened in channel and embankment sections (and the bridges within these sections) in the Killimor Arterial Drainage Scheme are shown on the map below, and tabulated in Appendix B.

Figure 4-1: Channels and embankments with potential impacts via land and air pathways

![Map showing channels and embankments with potential impacts](image-url)
5 Groundwater Pathways

5.1 Introduction
The following section of this report examines the groundwater pathways which may arise due to drainage maintenance activities in the Killimor Arterial Drainage Scheme having a significant effect on Natura 2000 sites.

5.2 Results for the Killimor Scheme

5.2.1 Level 1: Characterisation and Initial Impact Assessment
It is assumed that none of the proposed drainage maintenance activities in the Killimor Arterial Drainage Scheme are directly necessary to the nature conservation management of Natura 2000 sites.

Step 1
Each of the drainage maintenance activities detailed in Table 2-1 is proposed in the Killimor Arterial Drainage Scheme.

Step 2
The Killimor Arterial Drainage Scheme is located across two groundwater bodies (GWB). One GWB (Tynagh_1 - IE_SH_G_237) was screened out as it did not contain any Natura 2000 sites.

There are 12 Natura 2000 sites (9 SACs and 3 SPAs) located within the one remaining GWB and remain within the screening assessment, as detailed in Table 5-1.

Table 5-1: Groundwater Pathway - Step 2

<table>
<thead>
<tr>
<th>GWB name (EU_Code) and flow regime</th>
<th>Natura 2000 Site (Site Code)</th>
<th>Natura 2000 Site within GWB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tynagh_1 (IE_SH_G_237) Poorly Productive Bedrock</td>
<td>None</td>
<td>No</td>
</tr>
</tbody>
</table>

Step 3
The Qualifying Interests/Special Conservation Interests for each Natura 2000 site within the identified GWBs were obtained from the relevant Conservation Objective document available from the NPWS (2014). Table 5-2 below details which of the Natura 2000 sites identified in Table 5-1 above have Qualifying Interests/Special Conservation Interests which can be potentially impacted upon by groundwater pathways.

Eight Natura 2000 sites were identified as groundwater dependent (GWD) Qualifying Interests/Special Conservation Interests and therefore remain in this screening assessment, as detailed in Table 5-2.

Table 5-2: Groundwater Pathway - Step 3

<table>
<thead>
<tr>
<th>GWB name (EU_Code) and flow regime</th>
<th>Natura 2000 Site (Site Code)</th>
<th>GWD Qualifying Interests/ Special Conservation Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tynagh (IE_SH_G_236) Poorly Productive Bedrock</td>
<td>River Shannon Callows SAC (000216)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Barrouther Bog SAC (000231)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Cloonmoylan Bog SAC (000248)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Derrycrag Wood Nature Reserve SAC (000261)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Loughatorick South Bog SAC (000308)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Pollnaknockaun Wood Nature Reserve SAC (000319)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Rosturra Wood SAC (001313)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Ardgraigue Bog SAC (002356)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Middle Shannon Callows SPA (004096)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Slieve Auughty Mountains SPA (004168)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

5.2.2 Level 2: Existing Impact Assessment

Step 4

The ‘At Risk’ status (from the Environmental Protection Agency (EPA) WFD list) of all GWBs with Natura 2000 sites containing GWD Qualifying Interests/Special Conservation Interests was then determined; one was identified as being ‘At Risk’, as detailed in Table 5-3.

Table 5-3: Groundwater Pathway - Step 4

<table>
<thead>
<tr>
<th>GWB name (EU_Code) and flow regime</th>
<th>Natura 2000 Site (Site Code)</th>
<th>EPA Water Framework Directive ‘At Risk’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tynagh (IE_SH_G_236) Poorly Productive Bedrock</td>
<td>River Shannon Callows SAC (000216)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Barrouther Bog SAC (000231)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Cloonmoylan Bog SAC (000248)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Loughatorick South Bog SAC (000308)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
5.2.3 Level 3: Potential Impact and Significance Assessment

Step 5

This stage assesses whether there is potential for a drainage maintenance activity to effect the Qualifying Interests/Special Conservation Interests of the Natura 2000 site(s) within the zone of influence of a scheme. This is determined through undertaking a visual assessment of the topographic catchment of the Natura 2000 site, combined with application of a buffer to the Natura 2000 site boundaries at a pre-established distance dependent on the flow regime of the GWB (i.e. karstic, fissured, poorly productive, intergranular) (Ryan Hanley, 2014a). Depending on this, a conclusion can then be made as to whether potential effects may occur. The results of this are summarised in Table 5-4.

Table 5-4: Groundwater Pathway - Step 5
### Step 6

Relevant information relating to each Natura 2000 site still remaining in ten screening assessment at this stage, including the Conservation Objectives Supporting Document, Site Synopsis and Natura 2000 Standard Data Form, were then reviewed to identify the potential for pressures and threats and related cumulative and in-combination effects. The results of this assessment are detailed in Table 5-5.

**Table 5-5: Groundwater Pathway - Step 6**

<table>
<thead>
<tr>
<th>Natura 2000 Site (Site code)</th>
<th>Pressures or Threats</th>
<th>Presence of a Groundwater Pathway</th>
<th>Pressure/ Or Threat Codes from Article 17</th>
<th>Cumulative Impact and In-combination Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>Mechanical peat-cutting Drainage</td>
<td>Yes</td>
<td>C01.03.02</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Fire damage</td>
<td>No</td>
<td>J01</td>
<td>*Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td>Diffuse pollution to surface waters due to agricultural and forestry activities</td>
<td>Yes</td>
<td>H01.05</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Urbanised areas, human habitation</td>
<td>No</td>
<td>E01</td>
<td>*Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Outdoor sports and leisure activities, recreational activities</td>
<td>No</td>
<td>G01</td>
<td>*Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Invasive non-native species (Zebra Mussel)</td>
<td>No</td>
<td>I01</td>
<td>*Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Forest and Plantation management &amp; use</td>
<td>No</td>
<td>B02</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Ardraighe Bog SAC (002356)</td>
<td>Peat-cutting Drainage</td>
<td>Yes</td>
<td>C01.03</td>
<td>Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td></td>
<td>Fire damage</td>
<td>No</td>
<td>J01</td>
<td>*Potential Effect Proceed to Step 7</td>
</tr>
<tr>
<td>Lough Derg (Shannon)</td>
<td>Diffuse pollution to surface waters due to</td>
<td>Yes</td>
<td>H01.05</td>
<td>Potential Effect</td>
</tr>
</tbody>
</table>
### Step 7

This stage involves examining each of the GWBs in turn and determining, based on the GWD Qualifying Interests/Special Conservation Interests of each Natura 2000 site, whether they are likely to be significantly affected by the drainage maintenance activates. This is based on an assessment of whether the activity is up or down gradient of a Natura 2000 site.

**Tynagh (IE_SH_G_236) Poorly Productive Bedrock**

Table 5-6: Groundwater Pathway for SACs - Step 7 – Tynagh – Poorly productive bedrock (IE_SH_G_236)

<table>
<thead>
<tr>
<th>GWB Qualifying Interest Habitats</th>
<th>GWD Habitat Typology</th>
<th>Drainage maintenance activity location relative to Natura 2000 site</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Raised Bog (7110)</td>
<td>B1</td>
<td>Downgradient</td>
<td>Potential for significant effect</td>
</tr>
<tr>
<td>Degraded raised bogs still capable of natural regeneration (7120)</td>
<td>B1</td>
<td>Downgradient</td>
<td>Potential for significant effect</td>
</tr>
<tr>
<td>Depressions on peat substrates of the Rhyncchosporian (7150)</td>
<td>A</td>
<td>Downgradient</td>
<td>No potential for significant effect</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcereous fens with Cladium mariscus and species of Caricion davallianae (7210)</td>
<td>A#</td>
<td>Upgradient</td>
<td>Potential for significant effect</td>
</tr>
<tr>
<td>Alkaline fen (7230)</td>
<td>A#</td>
<td>Upgradient</td>
<td>Potential for significant effect</td>
</tr>
</tbody>
</table>
## GWB Qualifying Interest Habitats

| Alluvial forested with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] | A | Upgradient | Potential for significant effect |
|---|

### Ardgraigue Bog SAC (002356)

| Active Raised Bog (7110) | B1 | Uncertain | Potential for significant effect |
|---|
| Degraded raised bogs still capable of natural regeneration (7120) | B1 | Uncertain | Potential for significant effect |
| Depressions on peat substrates of the *Rhynchosporian* (7150) | A | Uncertain | Potential for significant effect |

Note:
- GWB Habitat Typology after Table 5.1 Kilroy et al (2008) in Ryan Hanley (2014a)
- A = Type A, Groundwater Discharge Zone Wetlands
- B = Type B, Groundwater Flow-through Depression Wetlands
- A or B = No available information, based on expert opinion
- B1 = Where identified by Kilroy et al (2008) as both A and B type. B has been selected as worst case scenario
- A* = Type A, Groundwater Discharge Zone Wetlands additionally identified in consultation with NPWS as potentially being impacted by downgradient activities

### Table 5-7: Groundwater Pathway for SPAs - Step 7 – Tynagh – Poorly productive bedrock (IE_SH_G_236)

<table>
<thead>
<tr>
<th>Habitats as per Natura 2000 Standard Data Form, Site Synopsis or COSD</th>
<th>Potential GWD habitats supporting SCIs Fossitt 2000 (Annex I)</th>
<th>GWG Habitat Typology</th>
<th>Drainage maintenance activity location relative to Natura 2000 site</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Mesotrophic standing waterbody [FL4]</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Marginal swamp vegetation fringing lough [FS2]</td>
<td>Hydrophilous tall herb fringe communities of plains and of the montane alpine levels (6430)</td>
<td>A</td>
<td>Upgradient</td>
<td>Potential for significant effect</td>
</tr>
<tr>
<td>Running Water [FW1, FW2]</td>
<td>Watercourses of plain to montane water levels with the <em>Ranunculion fluitantis</em> and <em>Callitricho-Batrachion</em> vegetation (3260)</td>
<td>A</td>
<td>Upgradient</td>
<td>Potential for significant effect</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td>Small-medium sized lakes [FL2 FL3, FL4]</td>
<td>Oligotrophic waters containing very few minerals of sandy plains (<em>Littorelletalia uniflorae</em>) (3110)</td>
<td>A</td>
<td>Downgradient</td>
</tr>
</tbody>
</table>
### Habitats as per Natura 2000 Standard Data Form, Site Synopsis or COSD

<table>
<thead>
<tr>
<th>Potential GWD habitats supporting SCIs Fossitt 2000 (Annex I)</th>
<th>GWD Habitat Typology</th>
<th>Drainage maintenance activity location relative to Natura 2000 site</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>waters with vegetation of the <em>Littorelletea uniflorae</em> and/or of the <em>Isoëto-Nanojuncetea</em> (3130) &lt;br&gt;Hard oligo-mesotrophic waters with benthic vegetation of <em>Chara spp.</em> (3140)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rivers [FW1, FW2] &lt;br&gt;Watercourses of plain to montane water levels with the <em>Ranunculion fluitantis</em> and <em>Calitricho-Batrachion</em> vegetation (3260) &lt;br&gt;Rivers with muddy banks with <em>henopodion rubri p.p.</em> and <em>Bidention p.p.</em> vegetation (3270)</td>
<td>A</td>
<td>Downgradient</td>
<td>No potential for significant effect</td>
</tr>
<tr>
<td>Conifer plantation [WD4]</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Blanket bog [PB2, PB3] &lt;br&gt;Blanket bog (<em>if active bog</em>) (7130) &lt;br&gt;Depressions on peat substrates of the <em>Rhynchosporion</em> (7150)</td>
<td>A</td>
<td>Downgradient</td>
<td>No potential for significant effect</td>
</tr>
<tr>
<td>Wet heath [HH3] &lt;br&gt;Northern Atlantic wet heaths with <em>Erica tetralix</em> (4010)</td>
<td>A</td>
<td>Downgradient</td>
<td>No potential for significant effect</td>
</tr>
<tr>
<td>Dry heath [HH1, HH2]</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Scrub [WS1]</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: <br>GWD Habitat Typology after Table 5.1 Kilroy et al (2008) in Ryan Hanley (2014a) <br>A = Type A, Groundwater Discharge Zone Wetlands <br>B = Type B, Groundwater Flow-through Depression Wetlands <br>A or B = No available information, based on expert opinion <br>B¹ = Where identified by Kilroy et al (2008) as both A and B type. B has been selected as worst case scenario <br>A² = Type A, Groundwater Discharge Zone Wetlands additionally identified in consultation with NPWS as potentially being impacted by downgradient activities

### Step 8

As part of this step, further information on the following GWBs was collected to determine the likely effects of drainage maintenance activities relative to the GWD Qualifying Interests/Special Conservation Interests of each site, based on their typology. No sites have specific assessments of the location of the GWD habitats in the conservation objectives supporting documents. All sites have proceeded to step 9.

### Step 9

A review of the attributes and targets for the Qualifying Interests/Special Conservation Interests has identified that there is potential for significant effects on GWD Qualifying Interests/Special Conservation Interests in the following Natura 2000 sites.

Table 5-8: Groundwater Pathway - Step 9

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential for Effects Based on Attributes</th>
<th>Potential for Likely Significant Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardgraigue Bog SAC (002356)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Barroughter Bog SAC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Step 10

The following Natura 2000 sites will require a Stage 2 Appropriate Assessment to be undertaken and the preparation of a Natura Impact Statement or further site specific investigations, if more data becomes available.

Table 5-9: Groundwater Pathway - Step 10

<table>
<thead>
<tr>
<th>Natura 2000 Site</th>
<th>Potential for Likely Significant Effects must be considered</th>
<th>Potential for Cumulative Impacts must be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardgraigue Bog (002356)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Baroughter Bog (000231)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore (002241)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The screened in channel and embankment sections (and the bridges within these sections) in the Killimor Arterial Drainage Scheme are shown on the map below, and tabulated in Appendix B.

Figure 5-1: Channels and embankments with potential impacts via groundwater pathways
6 Conclusions

From this screening exercise it has been determined that significant likely effects may arise on the following Natura 2000 sites as a result of OPW drainage maintenance activities.

Table 6-1: Conclusions

<table>
<thead>
<tr>
<th>Site</th>
<th>Pathway of Impact</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardgraigue Bog SAC (002356)</td>
<td></td>
<td>Drainage maintenance activities are some distance outside of the site, but still potential for adverse effects through groundwater pathways</td>
</tr>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td></td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site, but no surface water dependent habitats/species are present so only impacts via land and air and groundwater pathways</td>
</tr>
<tr>
<td>Lough Derg, North-East Shore SAC (002241)</td>
<td></td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site and have the potential to impact on features via all pathways.</td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td></td>
<td>Drainage maintenance activities are proposed for within Natura 2000 site and have the potential to impact on features via all pathways.</td>
</tr>
<tr>
<td>Slieve Aughty Mountains SPA (004168)</td>
<td></td>
<td>Hen Harrier and Merlin may be impacted upon via land and air pathways as site with 500m of drainage maintenance activities.</td>
</tr>
</tbody>
</table>

Note: Red = likely significant effect  
Green = no likely significant effect

The map below in Figure 6-1 shows the channels, embankments and structures screened in by this exercise as those where significant likely effects may arise.
Figure 6-1: Map of all channels, embankments and structures where significant likely effects may arise.
## Appendices

### A  Natura 2000 Site Attributes and Objectives

<table>
<thead>
<tr>
<th>Natura 2000 Site(s) (Site Code)</th>
<th>Conservation Objectives</th>
<th>Qualifying Interests - Annex I Habitats, Annex II or IV Species</th>
<th>Pathway of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ardraigue Bog SAC (002356)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Active raised bogs [7110]</td>
<td>Surface Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degraded raised bogs still capable of natural regeneration [7120]</td>
<td>Land &amp; Air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depressions on peat substrates of the <em>Rhynchosporion</em> [7150]</td>
<td>Ground-water</td>
</tr>
<tr>
<td>Barroughter Bog SAC (000231)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Active raised bogs [7110]</td>
<td>Surface Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degraded raised bogs still capable of natural regeneration [7120]</td>
<td>Land &amp; Air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depressions on peat substrates of the <em>Rhynchosporion</em> [7150]</td>
<td>Ground-water</td>
</tr>
<tr>
<td>Cloonmoylan Bog SAC (000248)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Active raised bogs [7110]</td>
<td>Surface Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degraded raised bogs still capable of natural regeneration [7120]</td>
<td>Land &amp; Air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depressions on peat substrates of the <em>Rhynchosporion</em> [7150]</td>
<td>Ground-water</td>
</tr>
<tr>
<td>Derrycrag Wood Nature Reserve SAC (000261)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Old sessile oak woods with Ilex and <em>Blechnum</em> in British Isles [91A0]</td>
<td>Surface Water</td>
</tr>
<tr>
<td>Loughatorick South Bog SAC (000308)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Blanket bog (*active only) [7130]</td>
<td>Surface Water</td>
</tr>
<tr>
<td>Lough Derg, North-east Shore SAC (002241)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td><em>Juniperus communis</em> formations on heaths or calcareous grasslands [5130]</td>
<td>Surface Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calcareous fens with <em>Cladium mariscus</em> and species of the <em>Caricion davallianae</em> [7210]</td>
<td>Land &amp; Air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alkaline fens [7230]</td>
<td>Ground-water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limestone pavements [8240]</td>
<td>Ground-water</td>
</tr>
<tr>
<td>Natura 2000 Site(s) (Site Code)</td>
<td>Conservation Objectives</td>
<td>Qualifying Interests - Annex I Habitats, Annex II or IV Species</td>
<td>Pathway of Impact Surface Water</td>
</tr>
<tr>
<td>--------------------------------</td>
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<td>---------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Rosturra Wood SAC (001313)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Alluvial forests with <em>Alnus glutinosa</em> and <em>Fraxinus excelsior</em> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</td>
<td>Red</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Taxus baccata</em> woods of the British Isles [91J0]</td>
<td></td>
</tr>
<tr>
<td>Pollnaknockaun Wood Nature Reserve SAC (000319)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Old sessile oak woods with <em>Ilex</em> and <em>Blechnum</em> in British Isles [91A0]</td>
<td></td>
</tr>
<tr>
<td>River Shannon Callows SAC (000216)</td>
<td>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</td>
<td>Otter <em>Lutra lutra</em> [1355]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Molinia</em> meadows on calcareous, peaty or clayey-silt-laden soils (<em>Molinion caeruleae</em>) [6410]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lowland hay meadows (<em>Alopecurus pratensis</em>, <em>Sanguisorba officinalis</em>) [6510]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limestone pavements [8240]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alluvial forests with <em>Alnus glutinosa</em> and <em>Fraxinus excelsior</em> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</td>
<td></td>
</tr>
<tr>
<td>Lough Derg (Shannon) SPA (004058)</td>
<td>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA</td>
<td>Tufted Duck <em>Aythya fuligula</em> [A061]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Goldeneye <em>Bucephala clangula</em> [A067]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cormorant <em>Phalacrocorax carbo</em> [A017]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common Tern <em>Sternula hirundo</em> [A193]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wetlands and Waterbirds</td>
<td></td>
</tr>
<tr>
<td>Middle Shannon Callows SPA (004096)</td>
<td>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA</td>
<td>Whooper Swan <em>Cygnus cygnus</em> [A038]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wigeon <em>Anas penelope</em> [A050]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corncrake <em>Crex crex</em></td>
<td></td>
</tr>
<tr>
<td>Natura 2000 Site(s) (Site Code)</td>
<td>Conservation Objectives</td>
<td>Qualifying Interests - Annex I Habitats, Annex II or IV Species</td>
<td>Pathway of Impact</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>this SPA</td>
<td></td>
<td>[A122] Golden Plover <em>Pluvialis apricaria</em> [A140]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[A122] Lapwing <em>Vanellus vanellus</em> [A142]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[A122] Black-tailed Godwit <em>Limosa limosa</em> [A156]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[A122] Black-headed Gull <em>Chroicocephalus ridibundus</em> [A179]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[A122] Wetlands and Waterbirds</td>
<td></td>
</tr>
</tbody>
</table>

| Slieve Aughty Mountains SPA (004168) | To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA | Hen Harrier *Circus cyaneus* [A082] |  
|                                      |                                                                     | Merlin *Falco columbarius* [A098]   |

Note:
Red = likely significant effect
Green = no likely significant effect
B Screening Results
References


