

Laois Kilkenny Reinforcement Project Environmental Reports

Appropriate Assessment Screening Report

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Executive Summary

This Appropriate Assessment Screening Report has been prepared to determine the potential impacts of the Laois Kilkenny Reinforcement Project on sites designated as European conservation areas known as Natura 2000 sites as required under Article 6 of the EU Habitats Directive.

There are up to four successive stages involved in the Appropriate Assessment process, the first stage of which is known as the Screening Stage. Screening is carried out to determine the necessity for a more detailed Stage 2 Appropriate Assessment where potential impacts are deemed to be of significance.

Four Natura sites were identified as occurring within five kilometres of the emerging preferred route corridor. During the screening stage it was determined that three of these sites (River Nore SPA, Lisbigney Bog SAC and Ballyprior Grassland SAC) will not be impacted upon either directly or indirectly as a result of the proposed development and therefore are excluded from appropriate assessment.

Based on the precautionary approach adopted during the assessment it was shown that the proposed development has the potential to adversely impact:

- the River Barrow and River Nore SAC during the construction phase

Hence a stage 2 appropriate assessment will be carried out to further examine the risk posed by the proposed project on the conservation interest of this Natura 2000 site.

1 Introduction

This report has been prepared by Dr Patrick Crushell on behalf of AOS Planning Ltd to determine the potential impacts of the Laois-Kilkenny Reinforcement Project on sites designated as European conservation areas known as Natura 2000 sites.

The aim of this assessment is to determine the potential direct, indirect and cumulative impacts of the proposed development on the conservation status of Natura 2000 sites in the surroundings.

1.1 Statutory Context

This Appropriate Assessment Screening Report has been prepared in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (European Commission 2002), the European Commission Guidance 'Managing Natura 2000 Sites' (European Commission 2000) and with reference to the Department of the Environment and Heritage and Local Government guidance on 'Appropriate Assessment of plans and projects in Ireland' (DEHLG 2009).

The EU habitats directive (92/43/EEC) provides the framework for legal protection for habitats and species of European importance. The directive provides the legislative means to establish a network of sites (known as the Natura 2000 network) throughout the EU with the objective of conserving habitats and species deemed to be of Community interest. These sites include Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive (formally known as the Conservation of Wild Birds Directive 79/409/EEC). Both directives have been transposed into Irish law by the recently enacted European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/11).

Article 6 (3) and 6(4) of the habitats directive lays down the procedure to be followed when planning new developments that might affect a Natura 2000 site. This stepwise procedure requires that a plan or project having a likely significant negative effect on a Natura 2000 site undergoes an 'Appropriate Assessment' to study these effects in detail and to see how they relate to the site's conservation objectives.

Depending on the findings of the Appropriate Assessment, the competent authority agrees to the plan or project as it stands if it has ascertained that it will not adversely affect the integrity of the site concerned.

However, should this assessment have ascertained that there will be an adverse effect it may require one or more of the following, depending on the degree of impact:

- specific mitigation measures are introduced to remove the negative effects;
- certain conditions are respected during the construction, operational or decommissioning phases of the project, again to remove the likelihood of negative effects or to reduce them to an insignificant level where they no longer affect the integrity of the site;
- feasible alternatives are explored instead.

In exceptional circumstances, a plan or project may still be allowed to go ahead under certain conditions, in spite of being assessed as having negative effects on the site provided the procedural safeguards laid down in the Habitats Directive are followed. This may be possible, for instance, if the plan or project is considered to be of overriding public interest and there are no alternatives available. In such cases, compensation measures will need to be implemented to ensure that the overall coherence of Natura 2000 is protected.

1.2 Methodology

There are up to four successive stages involved in the Appropriate Assessment process (European Commission 2002). The outcome at each stage determines whether the next stage in the process is required. Stage 1 Screening is the first stage in the process and is carried out to determine the necessity for a more detailed Stage 2 Appropriate Assessment where potential impacts are deemed to be of significance. The Stage 1 Screening comprises:

Stage 1: Screening

- Description of the project and site characteristics (existing environment)
- Identification and description of Natura sites that could potentially be affected
- Identification and description of potential impacts
- Assessment of potential impacts
- Exclusion of sites where no significant impacts are foreseen

A number of ecological reports and surveys have been carried out during the constraints identification and route evaluation stages of the proposed development to inform this Stage 1 Screening Appropriate Assessment including:

- Ecological constraints report October 2010 (part of *Phase 1 Lead Consultant's Report*)
- Winter bird surveys undertaken over two seasons (March – April 2010 and October 2010 - April 2011) (part of *Phase 1 Lead Consultant's Report*)
- Ecological assessment of potential route corridors and route corridor selection March 2011 (part of *Phase 1 Lead Consultant's Report*)

- Assessment of preferred route corridor which included multidisciplinary walkover surveys (to inform Ecological Impact Assessment)

A precautionary approach was taken throughout the route selection process with the aim of avoiding, where possible, potential impacts on the ecological constraints identified. The main ecological constraints of the project were identified at the earliest stage in the project.

2 Screening

2.1 Project Description

EirGrid is proposing to reinforce the electricity network in the general Laois-Kilkenny region. There are three main elements to the proposed new transmission infrastructure:

- a) A new 400/110 kV substation near Portlaoise, Co. Laois. The existing Athy - Portlaoise 110 kV and the Dunstown - Moneypoint 400 kV overhead lines will connect to this new substation.
- b) A new 110 kV extension to the existing 38 kV substation in Ballyragget, Co. Kilkenny.
- c) A new 110 kV overhead line between the new 400/110 kV substation near Portlaoise and the new 110 kV substation extension in Ballyragget, Co. Kilkenny.

Each of these elements are described in further detail below.

2.1.1 New 400/110 kV substation near Portlaoise

The proposed substation type deemed most appropriate for this project is known as a Gas Insulated Switchgear (GIS) substation whereby the equipment is contained within buildings. This type of substation is recommended based on both the cost and technical aspects as well as taking into account the overall smaller size and the associated reduced environmental and visual impact.

It is estimated that the GIS compound would be of the order of 1.06 hectares in size. A typical 400/110kV GIS substation compound consists of a 400kV building, typically circa 12m x 43m x 11m in height and a 110kV building typically circa 27m x 10m x 8m in height. These buildings contain the switchgear. The power transformers are located next to the 400kV building and are separated by a fire wall. The highest element of this substation is a single lightning protection structure in the centre of the compound which is typically circa 28m in height.

It is planned that the existing 400 kV Dunstown-Moneypoint and 110 kV Carlow-Portlaoise overhead lines will connect into this new GIS station by way of overhead lines.

It is also planned to construct a new 110 kV overhead line from this GIS substation to Ballyragget (see Section 2.1.3 below).

2.1.2 New 110 kV extension to existing 38 kV substation in Ballyragget

To facilitate the requirements of this reinforcement project a new 110 kV extension to the existing 38 kV Ballyragget substation is required.

The extension will be a compact Air Insulated Switchgear (AIS) extension and the size will be similar to what is already there. (i.e. 0.5 acres). Local realignment and rearrangement of the existing overhead line into the station will be required.

2.1.3 A new 110 kV overhead line between the new Laois 400/110 kV substation and the new 110 kV substation extension in Ballyragget

The proposed line will be constructed of double wood polesets (woodpole portal structures) at intermediate locations and galvanised steel lattice towers (single circuit angle structure) at angle positions.

Each intermediate poleset comprises of two wood poles, 5 metres apart, connected near the top with a rolled steel channel. The full length of the wood poles varies from 16-23m with a minimum 2.3m of this buried underground. The polesets carry three conductors (also known as phases) suspended from electrical insulators. These conductors carry the electrical current. Two earthwires are supported on top of the poles on earthwire brackets which extend 0.45 metres above the top of the pole. These earthwires serve to protect the overhead line from lightning strikes.

Lattice steel angle towers are used where the line changes direction. They typically range in height from circa 17 – 24 metres depending on the ground profile. The angle structure holds three conductors connected to electrical insulators in a horizontal formation along the lower crossarm. Two earthwires are supported on the upper crossarm.

2.1.4 Characteristics of each phase of the project

The proposed development is characterised by the following activities that could potentially impact on the ecology of Natura 2000 sites in the surroundings:

Construction phase

- New 400/110 kV substation near Portlaoise
 - Site clearance and construction of substation at the site of the proposed substation.
 - Construction of 400 kV overhead line between the existing 400 kV Dunstown-Moneypoint and the new Laois substation (ca 1.5 km distance).
 - Land clearance at areas where Towers are to be constructed.
 - The construction of both Single and Double circuit towers at predetermined locations to support the lines.

- Stringing of transmission cables along route
- Construction of 110 kV line to connect the existing Carlow-Portlaoise overhead line will to the proposed Laois substation.
 - Land clearance at areas where angle towers are to be constructed. Felling of forestry / woodland stands along the route of the overhead line
 - Construction of angle towers at pre-determined locations along the line routes
 - Erection of double wooden polesets to support the 110 kV overhead line at pre-determined locations between angle towers
 - Stringing of transmission cables along route
- New 110 kV extension to existing 38 kV substation in Ballyragget: Site clearance and construction of substation extension adjacent to the existing substation at Ballyragget.
- Construction of new 110 kV overhead line between the new Laois 400/110 kV substation and the new 110 kV substation extension in Ballyragget:
 - Land clearance at areas where angle towers are to be constructed. Felling of forestry / woodland stands along the line route
 - Construction of angle towers at pre-determined locations along the line route
 - Erection of double wooden polesets to support the 110 kV overhead line at pre-determined locations between angle towers
 - Stringing of transmission cables along route

Operational phase

- It is foreseen that frequent maintenance works will be carried out during the operation phase of the project to ensure the substations and overhead lines continue to function properly throughout its operational life.

Decommissioning phase

- At the end of its operational phase, the various components of the reinforcement project will be dismantled and removed off site.

Further more detailed information on the proposed project and construction methodology is presented in the relevant chapters of the environmental report accompanying the application.

2.2 Other projects

It is a requirement of Appropriate Assessment that the combined effects of the proposed development together with other plans or projects be assessed. The following projects have been considered in the assessment of cumulative and in-combination impacts:

- Uprating of Ballyragget to Kilkenny line from 38kV to 110 kV
- Nore 110 kV project (Eirgrid 2011)
- Athy 110kV project (Eirgrid 2011)

2.3 Identification and description of Natura sites

There are four Natura 2000 sites within 5 km of the proposed development as listed in Table 1 below and illustrated in Figure 1. The qualifying interests and conservation objectives of these sites are presented below while further more detailed descriptions of these four sites prepared by National Parks and Wildlife Service (NPWS) are presented in Appendix 1 - 4. It is considered that the proposed development will not have an effect on sites located further than 5 km. This evaluation is made taking into consideration the scale and characteristics of the proposed project as described in section 2.1 above.

Table 1: Designated Natura 2000 sites within 5km of Laois – Kilkenny Infrastructure Project (Source: GIS section, National Parks and Wildlife Service).

Name	Site Code	Distance from proposed Laois - Kilkenny Reinforcement Project
River Barrow and River Nore SAC	2162	110 kV Line crosses SAC at Boleybeg
River Nore SPA	4233	0.6 km West of 110 kV line at Moatpark
Lisbigney Bog SAC	0869	1.7 km West of 110 kV line at Loughill
Ballyprior Grassland SAC	2256	4 km East of proposed site of Laois substation

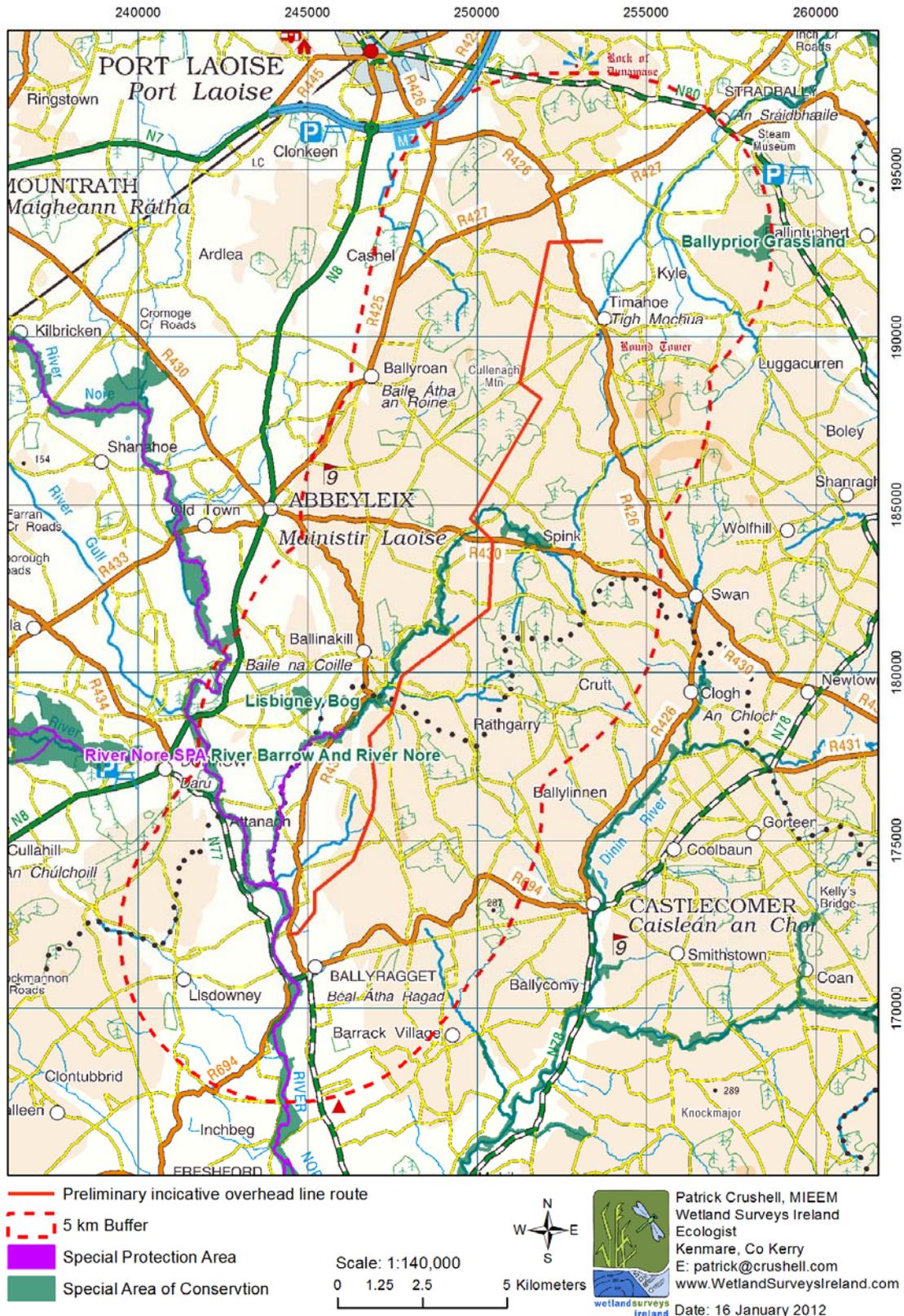


Figure 1: Preliminary indicative 110 kV overhead line route between proposed Laois 400 / 110 kV substation and the existing substation at Ballyragget in relation to designated Natura 2000 sites within 5 km of the proposed development.

2.3.1 River Barrow and Nore SAC (NPWS Site Code: 2162)

The qualifying interests of the River Barrow and Nore SAC include those species and habitats presented in Table 2. The conservation objectives for the site have recently been published together with the attributes and targets which define the favourable conservation condition for each qualifying species and habitat for which the site is designated (NPWS 2011a). In summary the Conservation objectives for the River Nore and Barrow SAC are 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 as presented in Table 2 below (NPWS 2011a).

Table 2: Qualifying interests of River Barrow and River Nore SAC (source: www.npws.ie).

	Habitat / Species code	Habitat / Species Type	
Habitats	91A0	Old sessile oak woods with Ilex and Blechnum in British Isles	
	91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	
	3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation	
	1310	Salicornia and other annuals colonizing mud and sand	
	1330	Atlantic salt meadows (Glaucopuccinellietalia maritimae)	
	1410	Mediterranean salt meadows (Juncetalia maritimi)	
	4030	European dry heaths	
	7220	Petrifying springs with tufa formation (Cratoneurion)	
	6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	
	1320	Spartina swards (Spartinion maritimae)	
	1140	Mudflats and sandflats not covered by seawater at low tide	
	1130	Estuaries	
	Species	1095	Sea Lamprey (<i>Petromyzon marinus</i>)
		1096	Brook Lamprey (<i>Lampetra planeri</i>)
1099		River Lamprey (<i>Lampetra fluviatilis</i>)	
1103		Twaite Shad (<i>Alosa fallax</i>)	
1106		Atlantic Salmon (<i>Salmo salar</i>)	
1102		Allis Shad (<i>Alosa alosa</i>)	
1355		Otter (<i>Lutra lutra</i>)	
1092		Freshwater White-clawed Crayfish (<i>Austropotamobius pallipes</i>)	
1029		Freshwater Pearl-mussel (<i>Margaritifera margaritifera</i>) ¹	
1990		Nore Freshwater Pearl-mussel (<i>Margaritifera durrovensis</i>)	
1016		Whorl Snail (<i>Vertigo moulinsiana</i>)	
1421		Killarney Fern (<i>Trichomanes speciosum</i>)	

¹The status of the freshwater pearl mussel as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review (NPWS 2011a).

2.3.2 River Nore SPA (NPWS Site Code: 4233)

Conservation Objective (NPWS 2011b): To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- [breeding] Kingfisher (*Alcedo atthis*)

2.3.3 Lisbigney Bog SAC (NPWS Site Code: 0869)

Conservation Objective (NPWS 2011c): 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:

- [1016] *Vertigo moulinsiana*
- [7210] * Calcareous fens with *Cladium mariscus* and species of the *Caricion davalliana*

2.3.4 Ballyprior Grassland (NPWS Site Code: 2162)

Conservation Objective (NPWS 2011d): 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:

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

2.4 Identification and Description of Potential Impacts

Taking into consideration the ecological characteristics of the Natura sites together with the nature of the proposed development, the following potential impacts have been identified:

Habitat loss and disturbance (construction phase): The construction of the 400 / 110 kV Laois substation, the extension of the Ballyragget substation and towers would cause direct long term loss of habitat in their foot-print. Both substations are removed from any Natura 2000 site and therefore this potential impact is not considered any further in the appropriate assessment.

The construction of the overhead lines would cause local disturbance and short term loss of habitat in the immediate vicinity of towers and polesets. This habitat loss and disturbance would in most cases be expected to be short term as following reinstatement and natural regeneration, vegetation would re-establish around the structure bases.

Should this impact occur within designated Natura 2000 sites then this impact could be of significance.

Water quality (construction phase): Pollution of watercourses with consequent impacts on aquatic species and ecosystems. There is potential risk to water quality

during the construction phase should concrete or other harmful substances become entrained in surface water run-off and enter watercourses.

In addition, mobilization and transport of sediment due to excavation of soil could potentially impact on freshwater ecology of water-courses downstream of construction works. The proposed development will also require felling of conifer plantations along much of the 110 kV line route. Such tree felling may pose a risk to water quality in downstream watercourses by releasing sediment and nutrients. The risk to water quality varies according to soil type and topography.

The proposed 400 / 110 kV Laois substation and the northern part of the preferred 110kV line route corridor is situated within the catchment of the River Barrow while the Ballyragget Substation and Southern part of the 110kV line route corridor is located within the River Nore Catchment. The main watercourses within both catchments, and downstream of the proposed development area, are designated within the extensive River Barrow and River Nore SAC.

Adverse impacts on water quality during the operation phase of the project are not foreseen due to standard best practice measures being employed during any maintenance operations. In addition, based on the characteristics of the operational phase of the project, few sources of potential impact on water quality are identified.

Disturbance to birds and mammals: During construction works there is potential for direct short term disturbance to birds and mammals in the vicinity of the proposed works. Such disturbance would be caused by increased human activity and noise from construction machinery. These impacts could be of significance if they were to cause disturbance to mammal and bird species that occur within Natura 2000 sites.

Bird collision (operational phase): New overhead lines may adversely impact on sensitive bird species. During the operational phase there is a potential risk of collision with birds of conservation concern. However, there are no Natura 2000 sites in the surroundings that have been designated for the protection of bird species that would be prone to collision. Furthermore recent surveys of winter bird populations and their movements within the wider study area indicate that there is low collision risk to any bird species of conservation interest (see winter bird reports submitted as part of *Phase 1 Lead Consultants Report*). This impact is therefore not considered further in the appropriate assessment.

2.5 Assessment of Significance

The potential impacts on the conservation interest of each Natura site identified in Section 2.3 above are dealt with in the following sections:

River Barrow and Nore SAC: The site is designated for a range of habitats and species listed on Annex 1 and Annex II of the EU Habitats Directive respectively (see Section 2.3 above).

There is potential for small scale direct habitat disturbance where the proposed 110 kV line crosses the SAC at Boleybeg. The magnitude of disturbance will depend on clearance requirements and the final positioning of structures in the vicinity of the SAC. As the designated area is ca 20 metres in width at this location it should be possible to avoid placing structures within the SAC. Some tree topping may be required at the river crossing. Improved Agricultural Grassland (GA1) surrounds the narrow riparian zone at this location. The river banks are defined by non-continuous lines of trees and shrubs that include Alder (*Alnus glutinosa*) and Ash (*Fraxinus excelsior*). The terrestrial habitats present at this location do not correspond with qualifying habitats for which the SAC is designated. Based on the terrestrial habitats recorded in the vicinity of the SAC, it is concluded that this potential impact is unlikely to adversely affect the conservation interest of the SAC.

During the construction phase there is potential for disturbance to Otters should they be present within the SAC in the vicinity of the line crossing. Territories of Otters that occur within the SAC may also include undesignated sections of rivers further upstream.

As outlined above, the proposed development occurs within the catchment of the River Barrow and River Nore SAC. A number of aquatic species and habitats would be sensitive to any deterioration in surface water quality within the SAC, including Floating river vegetation, Salmon, White-clawed Crayfish and the Nore Freshwater Pearl-mussel (NPWS 2011a).

During the construction phase of the project there is potential for sediment run-off via the surface water drainage system into the River Barrow and River Nore SAC. In addition, potential impacts due to contamination of surface water by concrete, fuel or other harmful substances are possible.

Based on the scale and location of the proposed development there is potential for significant adverse impacts on the conservation interest of the River Barrow and River Nore SAC. These potential impacts require further evaluation in the Appropriate Assessment.

River Nore SPA: This site has been recently designated for the protection of Kingfisher which is listed on Annex I of the EU Birds Directive. The SPA is designated due to the presence of a nationally significant population of Kingfishers (twenty two pairs recorded during a recent survey of the site (Cummins et al. 2010)). Kingfishers are restricted in their distribution to riparian habitats; they nest in burrows along

sandy river banks and feed on small fish. They tend to partake in low flight and spend most of the time within the river corridor.

The preliminary indicative overhead line route avoids traversing the SPA. No direct impacts on the conservation interest (the Kingfisher population) of the site are foreseen during the construction phase. Indirect impacts could result from any major deterioration in water quality and subsequent effects on the bird's food source (aquatic fauna species), however, considering the indicative line route at its nearest point (Moatpark) is proposed to cross a watercourse ca 0.6 km upstream of the SPA, and that no in-stream works are proposed, this potential impact is considered extremely un-likely. The use of best practice construction management techniques should prevent any deterioration of water quality within the SPA and therefore it is concluded that no significant adverse impacts on the SPA are foreseen.

Based on the flight behaviour and habitat preferences of kingfisher and the location of the line route in relation to the SPA it is considered that the proposed power line would not pose any significant collision risk during the operation phase.

Lisbigney Bog SAC: This site is designated for the protection of the EU priority habitat 'Calcareous Fen with *Cladium mariscus*' and the snail '*Vertigo moulinsiana*', which are listed on Annex I and Annex II respectively. The proposed overhead line route corridor is located a minimum of 1.7 km from this Natura 2000 site. The works associated with the construction of the line route in this area will be of such a local scale that any hydrological impacts will be temporary and restricted to those areas immediately surrounding the structure locations. It is concluded that based on the local hydrology and topography of the area, the conservation interest of the SAC, the characteristics of the proposed development and its distance removed from the SAC, no potential adverse impacts on the conservation interest of the site are foreseen.

Ballyprior Grassland SAC: This site is designated for the protection of the EU priority habitat 'Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (*important orchid sites)'. The proposed development is located ca 4 km from this Natura 2000 site. The habitat requirements of the grassland habitat for which the SAC is designated are such that it would not be sensitive to any potential indirect impacts of the proposed development. Therefore based on the conservation interest of the SAC, the characteristics of the proposed development and its distance removed from the SAC no potential adverse impacts on the site are foreseen.

2.6 Conclusion

In order to determine the potential impacts of the proposed Laois – Kilkenny reinforcement project on nearby Natura 2000 sites, appropriate assessment screening was undertaken. Four Natura 2000 sites were identified as occurring within 5 km of the proposed development.

It has been determined that three of these sites (River Nore SPA, Lisbigney Bog SAC and Ballyprior Grassland SAC) will not be impacted upon either directly or indirectly as a result of the proposed development and therefore are excluded from appropriate assessment.

Based on the precautionary approach adopted it has been shown that the proposed development has the potential to adversely impact the River Barrow and River Nore SAC during the construction phase.

A stage 2 appropriate assessment will be undertaken in order to further examine the risk posed by the proposed project on the conservation interest of this Natura 2000 site.

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APPENDIX 1

River Barrow and Nore SAC - NPWS Site Description

River Barrow & Nore SAC

NPWS site code 0002162

This site consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also runs through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

The site is a candidate SAC selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, 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 - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Nore Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter, *Vertigo moulinsiana* and the plant Killarney Fern.

Good examples of Alluvial Forest are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*),

White Willow (*S. alba*), Grey Willow (*S. cinerea*), Crack Willow (*S. fragilis*), Osier (*S. viminalis*), with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*). Three rare invertebrates have been recorded in this habitat at Murphy's of the River. These are: *Neoascia obliqua* (Diptera: Syrphidae), *Tetanocera freyi* (Diptera: Sciomyzidae) and *Dictya umbrarum* (Diptera: Sciomyzidae).

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

The best examples of old Oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the sixteenth century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved Bellflower and the moss *Leucodon sciuroides*. It has a typical bird fauna including Jay, Long-eared Owl and Raven. A rare invertebrate, *Mitostoma chrysomelas*, occurs in Abbeyleix and only two other sites in the country. Two flies *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

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

On the steeply sloping banks of the River Nore about 5 km west of New Ross, in County Kilkenny, Kylecorragh Woods form a prominent feature in the landscape.

This is an excellent example of a relatively undisturbed, relict Oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown a small, mature Oak-dominant woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Cow-wheat (*Melampyrum* spp.) and Bracken (*Pteridium aquilinum*).

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

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

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

Dry Heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken (*Pteridium aquilinum*) and Gorse (*Ulex europaeus*) species with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove (*Digitalis purpurea*), Common Sorrel (*Rumex acetosa*) and Bent Grass (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown

on the maps Bilberry (*Vaccinium myrtillus*) and Wood Rush (*Luzula sylvatica*) are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of Clover species including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

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

Saltmeadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickcloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) (Flora Protection Order, 1987) are found. The very rare Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present. Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Sea Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

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

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western

side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*.

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

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

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

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge (*Carex divisa*), Clustered Clover (*Trifolium glomeratum*), Basil Thyme (*Acinos arvensis*), Hemp nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh Grass (*Puccinellia fasciculata*), Meadow Barley (*Hordeum secalinum*), Opposite-leaved Pondweed (*Groenlandia densa*), Autumn Crocus (*Colchicum autumnale*), Wild Sage (*Salvia verbenaca*), Nettle-leaved Bellflower (*Campanula trachelium*), Saw-wort (*Serratula tinctoria*), Bird Cherry (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Broomrape (*Orobanche hederæ*) and Greater Broomrape (*Orobanche rapum-genistæ*). Of these the first nine are protected under the Flora Protection Order 1999. Divided Sedge (*Carex divisa*) was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge (*Carex strigosa*), Field Garlic (*Allium oleraceum*) and Summer Snowflake (*Leucojum aestivum*). Six rare lichens, indicators of ancient woodland, are

found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of EU Habitats Directive Annex II animal species including Freshwater Pearl Mussel (*Margaritifera margaritifera* and *M. m. durrovensis*), Freshwater Crayfish (*Austropotamobius pallipes*), Salmon (*Salmo salar*), Twaite Shad (*Alosa fallax fallax*), three Lamprey species - Sea (*Petromyzon marinus*), Brook (*Lampetra planeri*) and River (*Lampetra fluviatilis*), the marsh snail *Vertigo moulinsiana* and Otter (*Lutra lutra*). This is the only site in the world for the hard water form of the Pearl Mussel *M. m. durrovensis* and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.

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

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country.

Landuse at the site consists mainly of agricultural activities – many intensive, principally grazing and silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing

and walking, particularly along the Barrow towpath are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

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

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

APPENDIX 2

River Nore SPA - NPWS Site Description

River Nore SPA

NPWS Site Code: 004233

The River Nore SPA is a long, linear site that includes the following river sections: the River Nore from the bridge at Townparks, (north-west of Borris in Ossory) to Coolnamuck approximately 3 km south of Inistioge) in Co. Kilkenny; the Delour River from its junction with the River Nore to Derrynaseera bridge (west of Castletown) in Co. Laois; the Erkina River from its junction with the River Nore at Durrow Mills to Boston Bridge in Co. Laois; a 1.5 km stretch of the River Goul upstream of its junction with the Erkina River; the Kings River from its junction with the River Nore to a bridge at Mill Island, Co. Kilkenny. The site includes the river channel and marginal vegetation. For a large part of its course the River Nore traverses Carboniferous limestone plains; it passes over a narrow band of Old Red Sandstone rocks below Thomastown. The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher.

A survey in 2010 recorded 22 pairs of Kingfisher (based on 16 probable and 6 possible territories) within the SPA. Other species which occur within the site include Mute Swan (35), Mallard (267), Cormorant (14), Grey Heron (45), Moorhen (14), Snipe (17) and Sand Martin (1,029) – all figures are peak counts recorded during the 2010 survey.

The River Nore SPA is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

25.11.2010

APPENDIX 3

Lisbigney Bog SAC - NPWS Site Description

Lisbigney Bog SAC

NPWS site code 000869

This former lake basin, now criss-crossed by streams, is situated about 5 km north-east of Durrow.

Although referred to as a bog, this site is in reality a wetland dominated by fen vegetation. Areas of sedge-dominated communities with Meadowsweet (*Filipendula ulmaria*), Lesser Spearwort (*Ranunculus flammula*) and Bog-myrtle (*Myrica gale*) divide dense stands of Common Reed (*Phragmites australis*) in the south-west from areas of Great Fen-sedge (*Cladium mariscus*) towards the north-east. In the centre of the stand of reeds is a small area of standing water with an abundance of Marsh Cinquefoil (*Potentilla palustris*), accompanied by a variety of bryophyte species, including *Marchantia polymorpha*, *Calliergon giganteum* and *Bryum pseudotriquetrum*. Scrub and areas of grassland dominated by Purple Moor-grass (*Molinia caerulea*) surround the fen.

The rare snail *Vertigo moulinsiana* was recorded at the site in 1998. This species is a glacial relict with a disjunct European population that is considered to be vulnerable due to loss of habitat, in particular, drainage to wetlands. For this reason it is listed on Annex II of the E.U. Habitats Directive. In Ireland, the species is sparsely distributed in the central lowlands, where it mostly occurs in calcareous wetlands/fens.

Birdlife recorded at the site includes Jays, Blackcaps and Snipe.

Lisbigney Bog is of considerable conservation significance for the good example of Cladium fen, a priority habitat that is listed on Annex I of the E.U. Habitats Directive, and for the population of *Vertigo moulinsiana* that it supports.

APPENDIX 4

Ballyprior Grassland - NPWS Site Description

Ballyprior Grassland SAC

NPWS site code: 0002256

Ballyprior Grassland, 4 km south of the village of Stradbally in Co. Laois, is located at the north end of the Castlecomer Plateau on largely limestone bedrock. The soils of the area are generally thin and well drained, varying from a deeper sandy loam in lower places (10-20 cm depth), to thin or stony soil over local drift (5-10 cm depth) on the elevated plateau.

The site contains orchid-rich calcareous grassland, a priority habitat listed on Annex I of the EU Habitats Directive. The old grassland habitat is of high quality and the site is important due to the loss of similar habitat in surrounding areas. The site has an exceptionally rich mycoflora which is a good indication of grassland quality (in terms of continuity, lack of disturbance and low nutrient status).

There is abundant cover of grasses and herbs with a high level of species diversity, but low bryophyte cover. Quaking-grass (*Briza media*) is an abundant species, reflecting the calcareous conditions, in association with abundant Sheep's-fescue (*Festuca ovina*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Crested Dog's-tail (*Cynosurus cristatus*) and Common Bent (*Agrostis capillaris*). Other grass, sedge and rush species present include *Danthonia decumbens*, *Carex caryophyllea*, *C. flacca*, *C. pulicaris* and *Luzula campestris*. The herb-rich, calcicole flora is characterised by Early-purple Orchid (*Orchis mascula*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Yarrow (*Achillea millefolium*), Lady's Bedstraw (*Galium verum*), Mouse-ear Hawkweed (*Hieracium pilosella*), Thyme (*Thymus praecox*), Fairy Flax (*Linum catharticum*), Oxeye Daisy (*Leucanthemum vulgare*), Rough Hawkbit (*Leontodon hispidus*), Carline Thistle (*Carlina vulgaris*) and Autumn Gentian (*Gentianella amarella*), with Heath Dog-violet (*Viola canina*), Mountain Everlasting (*Antennaria dioica*) and Maidenhair Spleenwort (*Asplenium trichomanes*) prevalent around rock out-crops. On deeper soils, Wild Carrot (*Daucus carota*) and Pignut (*Conopodium majus*) are frequent.

The presence in certain places of species such as Carnation Sedge (*Carex panicea*), Devil's-bit Scabious (*Succisa pratensis*), Tormentil (*Potentilla erecta*) and Heath Bedstraw (*Galium saxatile*) indicates variation in conditions with paucity of minerals, and adds to the species diversity. Hazel (*Corylus avellana*) scrub, with a well developed ground flora, occurs on the extreme west margins of the grassland. There are also several ponds within the site adding further habitat diversity.

The Irish Hare (*Lepus timidus hibernicus*) occurs in the site. This endemic subspecies is listed in the Red Data Book and is legally protected under the Wildlife Act (1976).

Ballyprior Grassland was traditionally managed as a commonage for grazing of cattle and horses. But the recent division of the lands into private holdings has led to a drive to improve the agricultural quality and output of these lands. Much of the farmland in surrounding areas is improved. Recent damage has occurred to parts of the site and some damaged habitat has been excluded. Semi-improved grassland has developed from enrichment and fertilising in the west of the site, with persistent Common Sorrel (*Rumex acetosa*) in places. South of the site, recent afforestation has resulted in loss of contiguous grassland habitat.

In conclusion, Ballyprior Grassland is an important example of orchid-rich calcareous grassland, a habitat listed on Annex I of the EU Habitats Directive. The site contains a diverse flora and an exceptionally rich mycoflora.