



Laois-Kilkenny Reinforcement Project

Description of Project Constraints

PE687-F0261-R261-004-002

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1 Introduction

This report accompanies the Constraints Map PE687-D261-001-004-003, produced as part of the Laois-Kilkenny Reinforcement Project. This report gives a high level definition of each type of developmental or environmental constraint identified within the project study area and listed in the map legend or key.

The purpose of this report is to assist the reader in understanding the types of constraint found in the project study area and to assist in viewing the map.

The environmental or developmental constraints were obtained from the latest information from various sources including, National Parks and Wildlife Service (NPWS) of the Department of Environment, Heritage and Local Government (DoEHLG), Archaeological Survey of Ireland (ASI), Geological Survey of Ireland (GSI) and the Laois and Kilkenny County Development Plans.

In accordance with the 'Constraints Map' key/legend, definitions for the following constraints are provided.

- High Amenity Areas
- Significant Tree Groups
- Scenic Views
- Geological Sites of Interest
- Special Areas of Developmental Control (SADC)
- Forestry
- Nature Reserves
- Special Areas of Conservation (SAC)
- Natural Heritage Areas (NHA)
- proposed Natural Heritage Areas (pNHA)
- Sites and Monuments Record (SMR)
- Existing Infrastructure
- Settlements, Ribbon Developments & One off Housing

The identified constraints will show areas of opportunity and areas which should be avoided where possible. This will then form the starting point for identification of potential locations where the proposed infrastructure can be placed.

Some constraints can be considered more significant than others. For example, designations containing EU Habitats Directive Annex I and Annex II species or habitats are also included in the report. These Directives are very important to detect and protect species in the area.

2 Study Area Definitions

2.1 Project Study Area

The Project Study Area is the broad geographical region within which a practical feasible route corridor can expect to be found. In this case it covers an area of approximately 29km x 30km (870 sq km). The study area was established taking into consideration the connection requirements for the project. These requirements include connection to the Dunstown – Moneypoint 400kV overhead line, connection to the Carlow – Portlaoise 110kV overhead line and a connection to a new 110kV extension of the existing Ballyragget 38kV substation. This study area has been reviewed by AOS Planning Consultants and it is deemed to be an appropriately sized study area based on the objective set out above.

The Project Study Area mainly spans between the counties of Laois and Kilkenny but at its extremities also encroaches into counties Kildare and Carlow. The Project Study Area is bounded to the north by Portlaoise, to the east by Athy, to the west by Mountrath, and to the south by Freshford.

The Project Study Area is rural in nature and is characterised by farmland interspersed with towns, villages and settlements connected by a complex national, regional and local road network.

The landscape of the Project Study Area is mainly characterised by lowlands through which the River Nore flows and higher ground underlain by the Castlecomer Plateau. The lowlands in the western section are underlain by limestone and are generally flat and have fertile soils. The area is dominated by farmland, with a network of fields containing improved grasslands and tillage connected by hedgerows.

The Castlecomer Plateau area contains higher ground extending up to 330m and is underlain by shales and sandstone. This area has an undulating hilly landscape with low peaks and some low-lying valleys that are drained by tributaries of the River Nore. This type of environment and geology means that soil is less fertile with impeded drainage and as a result wet grasslands are a prominent feature of these hillsides. Conifer plantations are also regularly found in this area. Elevation in the study area ranges from 60metres (m) along the River Nore channel to 326m near Fossy Mountain.

The majority of this Project Study Area is found within the River Nore catchment and the proposed site of the 110kV substation at Ballyragget is positioned near the river. A section on the eastern side of the study area lies within the River Barrow catchment.

2.2 Substation Study Area

The substation study area is found within the overall Project Study Area. This is a 4km diameter circular study area, approximately 12.5 km sq in area, within which it can be reasonably expected to find a suitable location for the 400/110 kV substation. The centre point of this circular study area is located at the point of

intersection (crossover) of the existing 400 kV Dunstown - Moneypoint and 110kV Carlow-Portlaoise overhead lines. These existing lines will be connected into the new substation, so locating the substation close to this crossover point will minimise the lengths of line/diversions required to make this connection.

3 Constraints Map Legend Description

The Project Study Area Constraints Map can be viewed on the Laois – Kilkenny page of the transmission projects section of the EirGrid website¹. This Constraints Map marks up all of the constraints on one map. These are shown by coloured shading. A key/legend shows which particular colour/shading relates to which particular constraint. There are many different constraints in both type and number and many of these overlap so they can be difficult to see on one 'master' drawing. We therefore also provide individual maps online which separate the individual constraints into appropriate groups.

Each constraint is defined by a particular legislation or source. For example some constraints can be considered important on a European level, whilst others would be of national importance and others local. These are listed in Table 3.1 below.

Constraint	Source	Geographical Importance (Rating)
High Amenity Areas	Laois/Kilkenny Development Plans	County Importance
Significant Tree Groups	Laois/Kilkenny Development Plans	County Importance
Scenic Views	Laois/Kilkenny Development Plans	County Importance
Geologically Significant Areas	Geological Survey of Ireland	National Importance
Special Areas of Developmental Control	Laois/Kilkenny Development Plans	County Importance
Forestry	Dept. of Agriculture, Fisheries & Food	No Valuation
Nature Reserves	National Parks and Wildlife Service	National Importance
Special Areas of Conservation	National Parks and Wildlife Service	International Importance
Natural Heritage Areas	National Parks and Wildlife Service	National Importance
proposed Natural Heritage Areas	National Parks and Wildlife Service	National Importance
Sites and Monuments Record (SMR)	Archaeological Survey of Ireland (ASI)	National Importance
Existing Infrastructure	Service providers	National Importance
Settlements, Ribbon Developments & One off Housing	Geo – Directory plus OSi mapping	County Importance

Table 3.1: List of Constraints and their Sources

¹ <http://www.eirgridprojects.com/projects/laoiskilkenny/>

3.1 High Amenity Areas

A High Amenity Area as defined in the relevant County Development Plan is an area of sensitive and vulnerable landscape, with limited environmental capacity to accommodate further development. Any development will require that no permanent harm is caused to the view or amenity from that area.

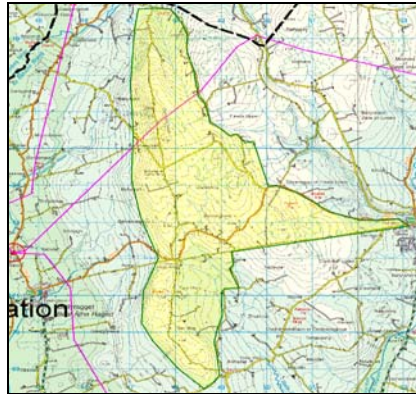


Figure 3.1: Example of a High Amenity Area: Located 3km East of Ballyragget 38kV Substation (Yellow shading on map).

3.2 Significant Tree Groups

There are a number of Significant Tree Groups located within the Project Study Area highlighted on the Constraints Map.

It is the policy of Laois and Kilkenny County Councils to maintain and enhance the natural heritage and amenity of their respective counties, by promoting the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees. Tree Protection Orders (TPOs) will be used as appropriate to protect individual trees or groups of trees of unique or special character. The county councils will promote the planting of native tree and shrub species, by committing to using native species wherever possible in its landscaping work and on county council property.

3.3 Scenic Views

There is a need to protect and conserve views and prospects adjoining public roads and river valleys throughout our countryside as these views are of high amenity value. In conserving views, a development, where permitted, should not seriously hinder or obstruct these views. Careful design and planning is needed to minimise their impact.

The study area has identified scenic views to the East and North-East of Ballyragget 38kV Substation, some of which are shown below in Figure 3.2.

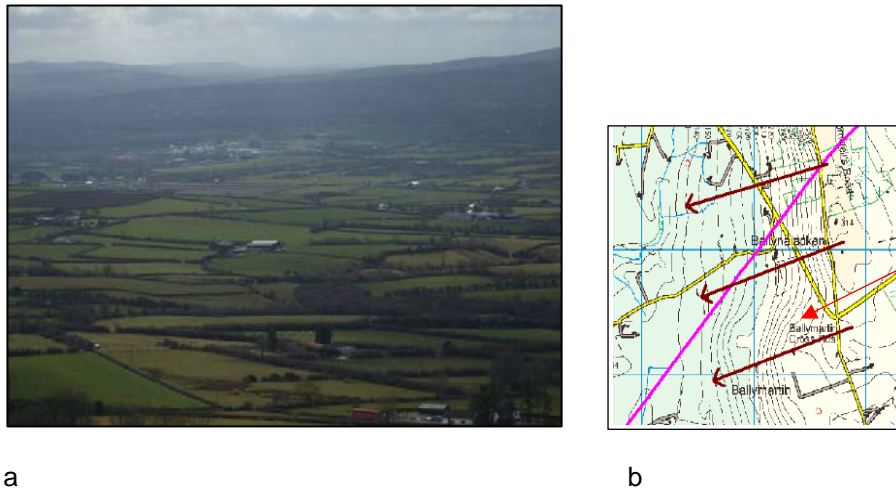


Figure 3.2: a) Photo of Scenic View at Ballynalacken
b) Map Showing Location & Aspect of Scenic View (Arrows on map)

3.4 Geological Sites of Interest

A Geological Site of Interest is considered an area which may have key types of deposits depending on the consolidation.

There are a number of areas within the project study area considered to be of geological interest. One such Site is 3km South of Ballyragget and is known as Ballyragget Quarry. As this site is considered of geological interest by the Geological Survey of Ireland (GSI) it is required that where there is any development in the area that the GSI be contacted.



Figure 3.3: Geological Site of Interest, located 3km South of Ballyragget
(Orange symbol on map)

3.5 Special Areas of Developmental Control (SADC)

A Special Area of Developmental Control (SADC) is an area in need of special protection due to its sensitive character. In general SADC overlap with NHA and SAC designation, however, some of the areas lie outside of these designations and therefore warrant special consideration due to their visual amenity.

It is the policy of all county councils to prohibit visually obtrusive development in Special Areas of Developmental Control.

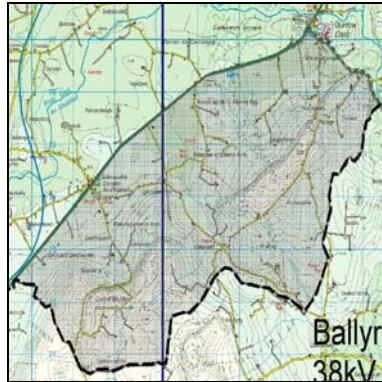


Figure 3.4: Special Area of Development Control located 5km Northwest of Ballyragget 38kV Substation (Grey shading on map)

3.6 Forestry

Forestry (including woodland and hedgerows) has economic and recreational potential. The benefits of forests should be maintained and enhanced by promoting the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees. Large hedgerows are also common along the roads and as field boundaries.

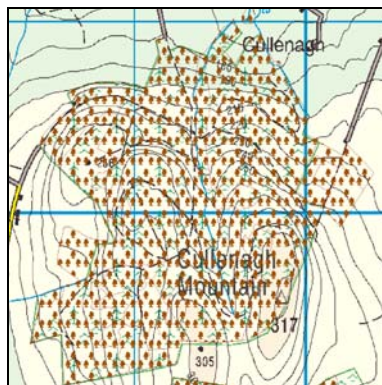


Figure 3.5: Example of Forestry: Cullenagh Mountain 6km Northeast of Abbeylisk (Brown tree like hatching on map).

3.7 Nature Reserves

As defined by the NPWS, a Nature Reserve is an area of importance to wildlife, which is protected under Ministerial order. Most are owned by the state, however some are owned by organisations or private landowners.

There are three Nature Reserves in Laois and one Nature Reserve in Kilkenny.

Nature Reserves in Laois:

- Grantstown Wood and Granston Lough Nature Reserve and Coolacurragh Wood
- Slieve Bloom Mountains Nature Reserve
- Timahoe Esker Nature Reserve.

Nature Reserve in Kilkenny:

- Fiddown Island Nature Reserve

The only Nature Reserve in the Project Study Area is Timahoe Esker Nature Reserve, found 1km north east of Timahoe. This state owned Nature Reserve was established in 1985 and is approximately 13.5 ha in area. It consists of Ash woodland with pedunculate oak and grey willow, hawthorn and hazel. The herb layer includes bluebell, bugle and shield fern.

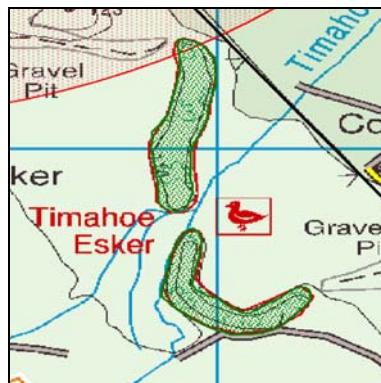


Figure 3.6: Example of a Nature Reserve: Timahoe Esker located 5km Southwest of Stradbally

3.8 Special Areas of Conservation (SAC)

Special Areas of Conservation (SAC) are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. Most SAC are in the countryside, although a few sites reach into town or city landscapes. The legal basis on which SAC are selected and designated is the EU Habitats Directive, transposed into Irish law in the European Union (Natural Habitats) Regulations, 1997 as amended in 1998 and 2005. The Directive lists certain habitats and species that must be protected within SAC.

Irish Habitats include raised bogs, blanket bogs, turloughs, sand dunes, machair (flat sandy plains on the north and west coasts), heaths, lakes, rivers, woodlands, estuaries and sea inlets. The 25 Irish species which must be afforded protection include Salmon, Otter, Freshwater Pearl Mussel, Bottlenose Dolphin and Killarney Fern.

The areas chosen as SAC in Ireland cover an area of approximately 13,500 square kilometres. Roughly 53% is land, the remainder being marine or large lakes. Across the EU, over 12,600 sites have been identified and proposed, covering 420,000 square kilometres of land and sea, an area the size of Germany.

A list of SAC found in Laois is as follows, the primary ones within the Project Study Area being the River Barrow and River Nore SAC & Ballyprior Grassland SAC

- Slieve Bloom Mountains SAC
- Clonaslee Eskers and Derry Bog SAC
- Lisbigney Bog SAC (see figure 3.7)
- Mountmellick SAC
- River Barrow and Nore SAC
- Ballyprior Grassland SAC
- Coolrain Bog SAC
- Knockacoller Bog SAC

A list of SAC found in Kilkenny is as follows, the primary one within the Project Study Area being the Ballyprior Grassland SAC

- Hugginstown Fen SAC
- The Loughans SAC
- Cullahill Mountain SAC
- Spahill and Clomantagh Hill SAC
- Galmoy Fen SAC
- Lower Suir SAC
- River Barrow and Nore SAC
- Thomastown Quarry SAC
- Ballyprior Grassland SAC

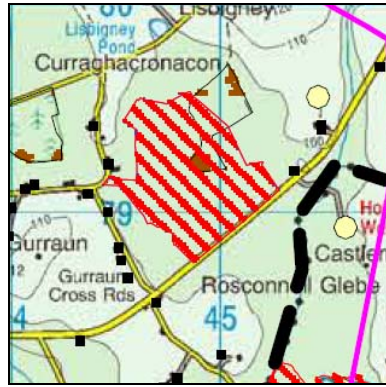


Figure 3.7: Lisbigney Bog SAC: 2km Southwest of Ballinakill (Red hatching on map).

3.9 Natural Heritage Areas (NHA)

The basic designation for wildlife is the Natural Heritage Area (NHA). A NHA is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. To date, in Ireland, 75 raised bogs have been given legal protection, covering some 23,000 hectares. These raised bogs are located mainly in the midlands. A further 73 blanket bogs, mainly in the western areas, covering 37,000 hectares, are also designated as NHA's.

Under the Wildlife Amendment Act (2000), NHA's are legally protected from damage from the date that they are formally proposed for designation.

NHA's in Laois:

- Monaincha Bog / Ballaghmore Bog
- Clonreher Bog.

NHA's in Kilkenny:

- Coan Bogs

The only NHA in the Project Study Area is Coan Bog NHA in Coan, 5km to the east of Castlecomer, County Kilkenny. This is shown below in Figure 3.8.

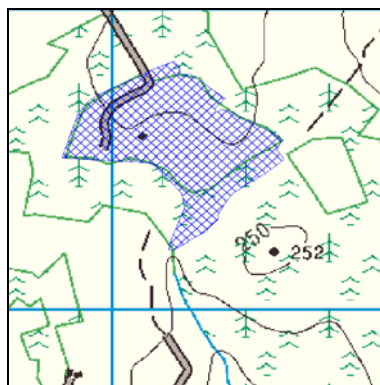


Figure 3.8: Coan Bog NHA: 5km East of Castlecomer (Blue hatching on map).

3.10 Proposed Natural Heritage Areas (pNHA)

In addition to the NHA there are 630 proposed Natural Heritage Areas (pNHA) in Ireland. These were published on a non statutory basis in 1995, but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. Some of the pNHA are tiny, such as a roosting place for rare bats. Others are large- a woodland or a lake, for example. The pNHA cover approximately 65,000 hectares and according to the NPWS, designation will proceed on a phased basis over the coming years.

Prior to statutory designation, pNHA are subject to limited protection, in the form of:

- Rural Environment Protection Scheme (REPS) plans which require conservation of pNHA and operate for a period of 5 years;
- Forest Service requirement for NPWS approval before they will pay afforestation grants on pNHA lands;
- Recognition of the ecological value of pNHA by Planning and Licensing Authorities.

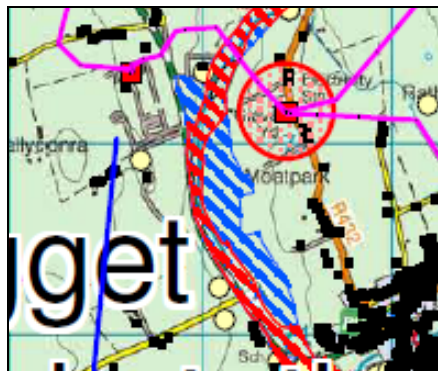


Figure 3.9: River Nore pNHA 500m West of Ballyragget Substation (Blue hatching on map)

3.11 Sites and Monuments Record (SMR)

The purpose of the Archaeological Survey of Ireland (ASI) is to compile an inventory of archaeological monuments. Its archive contains records of all known or possible monuments predating 1700 AD that have been brought to its attention and also includes a selection of monuments from the post-1700 AD period. Recorded Monuments are protected under the National Monuments Acts, and anyone planning to carry out work of any kind at these sites, must give two months prior notice to the Minister for the Environment, Heritage and Local Government.

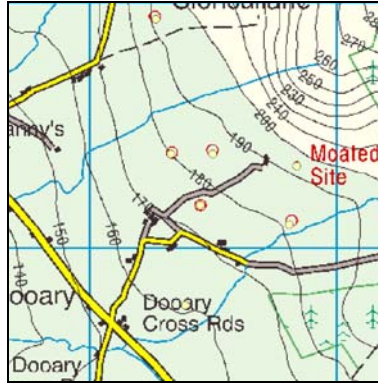


Figure 3.10: Example of an (SMR): Moated Site located 2km East of Ballyroan (Small yellow circle on map).

3.12 Existing Infrastructure

There is a significant amount of existing infrastructure within the Project Study Area including a good network of regional and rural roads, the M7 motorway, N8, N77 and N78 National Roads.

The Project Study Area also hosts several transmission lines including the Dunstown - Moneypoint 400kV overhead line and the Carlow - Portlaoise 110kV overhead line. There are a number of 38kV lines and the area has MV, LV and telecom lines throughout. Underground gas pipelines are also within the Project Study Area.

Consideration must be given to existing ESB and Bord Gais infrastructure within the Project Study Area. This infrastructure is a constraint in that the route of any proposed electrical corridor will have to take due consideration of the location of these existing services and mitigate the impact on same in so far as is reasonably practicable.

3.13 Settlements, Ribbon Development & One Off Housing

The main settlements in the area outside Portlaoise town are Abbeyleix, Ballinakill, Ballylynan, Ballyroan, Durrow and Stradbally in County Laois and Ballyragget and Castlecomer in County Kilkenny. All of these towns have associated ribbon development. Ribbon development is also prevalent outside the villages throughout the Project Study Area. The area is also peppered with one off housing and farmsteads.

4 Preliminary Ecological Evaluation

As part of the Ecological Study conducted within the Project Study Area, Special Areas of Conservation (SAC), Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA) have been identified. Note: Important Bird Areas, Fisheries and other rare notable species, are also identified as constraints where relevant; however, they have not been highlighted on the Constraints Map.

As can be seen from the Constraints Map this Project Study Area contains many sites of ecological and conservation interest that have been designated by the National Parks and Wildlife Service (NPWS) as Special Areas of Conservation (SAC), Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHA). A detailed description of each of these and their associated flora and fauna follows in Appendix 1.

The Project Study Area also includes one Nature Reserve that is owned by the state (Timahoe Eskers). The main designated site is the River Nore and River Barrow SAC. This large SAC includes the main River Nore channel and the majority of the main tributaries of this river. Some of these designated areas overlap with each other and some of the pNHA are sub-sites of the larger SAC.

Type	NPWS site code	NPWS Names	County	Notes
SAC	002256	Ballyprior Grassland	Laois	
SAC	002162	River Barrow and River Nore	Laois/Kilkenny	
SAC & pNHA	000869	Lisbigney Bog	Laois	
pNHA	000860	Clopook Wood	Laois	
pNHA	001923	Shanahoe Marsh	Laois	
pNHA	001800	Stradbally Hills	Laois	
pNHA	000420	The Curragh and Goul River	Laois	
pNHA	000421	Timahoe Esker	Laois	Also a Nature Reserve
pNHA	002076	River Nore/Abbeyleix Woods Complex	Laois/Kilkenny	
pNHA	000836	Inchbeg	Kilkenny	
pNHA	000408	Mothel Church, Coolcullen	Kilkenny	
NHA	002382	Coan Bog	Kilkenny	

Table 4.1 Sites of Conservation within the Project Study Area – see Appendix 1 for synopsis of each site

Appendix 1 – Site Synopses

The following site synopses are taken from www.npws.ie and are a description of the sites as designated.

Ballyprior Grassland

Designation: SAC

Site Code: 002256

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).

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 has been 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 forestation 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.

River Barrow and River Nore

Designation: SAC

Site Code: 002162

This site consists of the freshwater stretches of the River Barrow and River Nore 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 counties Laois and Kilkenny.

The site is designated as a Special Area of Conservation (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 an 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 Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site.

The best examples of old Oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix.

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.

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 upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater Mussel species, *Anodonta anatina* and *A. cygnea*.

Lisbigney Bog

Designation: SAC & pNHA

Site Code: 000869

This former lake basin, now criss-crossed by streams, is situated about 5 km northeast of Durrow. Although referred to as a bog, this site is in reality a wetland dominated by fen vegetation.

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 due to the presence 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.

Clopook Wood

Designation: pNHA

Site Code: 000860

This small site is located several kilometres south of Stradbally, Co. Laois. A small Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*) woodland occurs on the steep, rocky slopes of a prominent limestone hill, which is a typical example of Tertiary karst limestone landscape in Laois. The ground flora contains a good diversity of calcicole species and a rich bryophyte flora has also been recorded. Clopook is reported to contain many long, narrow passages that have archaeological importance but at present many of the openings have been blocked off or are overgrown.

Shanahoe Marsh

Designation: pNHA

Site Code: 001923

Shanahoe Marsh is located several kilometres north-east of Abbeylisk and also overlaps with the River Barrow and River Nore SAC. Shanahoe Marsh is an area of wet grassland, hay meadow and freshwater marsh. Other habitats of interest within the site are Gorse (*Ulex europaeus*) scrub, river, drainage ditches and a small area of fen. The main ecological interest of this site is that it is a major roost and feeding ground for a small flock of Greenland White-fronted Geese during winter.

Stradbally Hills

Designation: pNHA

Site Code: 001800

This site is located on several limestone hills located 2 km east and south of Stradbally, Co. Laois. The site is divided into four separate sections. These hills contain broad-leaved woodland that can mainly be classified as WN2 Oak-Ash-Hazel type woodland and includes some mixed woodland and conifer plantation.

These woodlands have a well-developed structure and good flora in places. Parts of the woodlands are currently being managed as part of the Native Woodland Scheme. Woodlands with mature Pedunculate Oak on mineral soil are rare in county Laois.

The Curragh and Goul River

Designation: pNHA

Site Code: 000420

This site is located along the floodplain of the Erkina River and overlaps with the River Barrow and River Nore SAC. It is mainly a stretch of flat wet meadowland through which flows the River Erkina and its tributary, River Goul. The substratum is predominantly calcareous peat on which has developed diverse wet grassland communities. Some fen and freshwater marsh habitat is also present.

The rare and legally protected Pondweed (*Groelandia densa*) (Flora Protection Order 1989) has been recorded in extensive beds of marsh plants along the River Goul. The meadowland is an important winter feeding site for Greenland White-fronted Geese, a species listed in Annex I of the EU Birds Directive.

Timahoe Esker

Designation: pNHA

Site Code: 000421

This pNHA (also a NNR) is divided into four sections and is located around Timahoe Village in Co. Laois. Eskers are raised ridges of sand and gravel that were deposited under the ice mass, during the last period of glaciation. The esker ridges at this site support broad-leaved woodland dominated by multi-stemmed Hazel (*Corylus avellana*). The Timahoe Eskers are important as they are among the best of the few intact eskers remaining in Co. Laois.

River Nore/Abbeyleix Woods

Designation: pNHA

Site Code: 002076

This site is located along the River Nore and extends from Shanahoe in Co. Laois to Ballyragget in Co. Kilkenny. This site overlaps with the River Barrow and River Nore cSAC, although the pNHA designation is more extensive and takes in more of the woodland around Abbeyleix. It contains many features of scientific importance. Between the Abbeyleix estate and Attagh Bridge, the River Nore contains a large population of the Irish Freshwater Pearl Mussel (*Margaritifera durrovensis*). This mussel is only found in the Nore river catchment and because of its rarity, it is of international importance. Several species listed in the Red Data Book, Summer Snowflake (*Leucojum aestivum*) and Meadow Saffron (*Colchicum*

autumnale), also a legally protected Irish Red Data Book species (Flora Protection Order 1989), are locally common in damp meadows and on the river banks in the pNHA.

Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland and is comparable to only two other sites in Ireland. Historical records show that an area called Park Hill has been continuously wooded since the sixteenth century and has the most complete written record of any woodland in the country. It contains several woodland habitats including a large area of WN2 type woodland dominated by Pedunculate Oak and some alluvial woodland along the river. Large parts of the woodland have been replanted with conifers in the past and have been disturbed, although some of this habitat is currently being restored as part of the Native Woodland Scheme.

Inchbeg

Designation: pNHA

Site Code: 000836

Inchbeg is a pNHA located in the floodplain of the River Nore several kilometres south of Ballyragget. This site overlaps with the larger River Barrow and River Nore SAC. The main habitat of interest here is lowland wet grassland, with some ponds, streams, freshwater marshes, semi-natural deciduous woodland, hedges and scrub. Much of the site is under water during the winter and it provides a habitat for bird species not commonly seen in this area. Golden Plover and Lapwing occur in large numbers; Whooper Swans and Bewick's Swans also use the site in the winter. This site is primarily of ornithological interest because of its value to birdlife. It is also of local importance for its flora because it represents one of the few places in this area which has not been intensively farmed and thus the vegetation still remains relatively undisturbed.

Mothel Church, Coolcullen

Designation: pNHA

Site Code: 000408

This small pNHA is a nursery colony of Natterer's Bats (*Myotis nattereri*) located in the loft of the Church of Ireland, Mothel, Coolcullen, Co. Kilkenny.

Over 100 bats were counted at the site in 1993 making it one of the biggest in the country. As the national population of Natterer's bats is estimated to be only several thousand, this nursery roost is of both National and International Importance.

This site is located near the southern edge of the survey site and is unlikely to be affected by any of the selected routes.

Coan Bogs

Designation: NHA

Site Code: 002382

Coan Bogs NHA consists of two small areas of upland blanket bog located to the east of Castlecomer, Co. Kilkenny. The first bog lies in the townland of Coan East, 2.5 km to the north-east of Coan village at an altitude of between 270 and 281 metres. The second bog is situated 3 km to the north-west of Coan village in the townland of Smithstown. It lies at an altitude of 240 metres. Bedrock geology for both areas is shale overlain locally by glacial till. Blanket bog vegetation is well developed in central areas of both bogs although cutover surrounds them. Plantation forestry also surrounds the sites.

Coan Bogs NHA is a site of considerable conservation significance consisting of upland blanket bog. This site, although small, is undisturbed and shows good characteristics of blanket bog with some raised bog indicator species. Blanket bog habitat is a globally scarce resource. It is largely confined to coastal regions at temperate latitudes with cool, wet, oceanic climates. North-west Europe contains some of the best-developed areas of blanket bog in the world.

The most extensive areas are found in Ireland and Britain. Upland blanket bogs, due to their exposure to severe climatic conditions at high elevations, are particularly vulnerable to erosion by human activities and extensive areas are currently undergoing active erosion due mainly to overgrazing. The current area of intact upland blanket bog in Ireland represents only a fraction of the original resource, due to the combined impacts of forestation and overgrazing, and intact examples are therefore extremely valuable for nature conservation. Their long-term survival requires sensitive management.