

Laois - Kilkenny Reinforcement Project Environmental Reports

Route Corridor Assessment Report – Flora and Fauna

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1. Introduction

This report provides an ecological assessment of the potential route corridors in the project study area defined for the Laois-Kilkenny Reinforcement Project. The project study area extends from its southern boundary about 6km south of Ballyragget, Co. Kilkenny to its northern boundary at Stradbally, Co. Laois, and from its eastern boundary about 2km west of Athy, Kildare to its western boundary 4km west of from Durrow, Co. Laois. This report has been prepared by Dr. Patrick Crushell, Consulting Ecologist, PHD, MIEEM.

A previous Constraints Report identified the most significant ecological constraints within the study area (*Study Area Constraints Report, AOS Planning Ltd October 2010*). The potential route corridors have been designed having regard to the identified constraints. The main objectives of this desk study were to identify potential ecological constraints on each proposed route corridor and select the 'most suitable' route corridor that will minimise the overall ecological impact of the proposed development on the study area.

2. Methodology and Information Sources

This report follows guidelines recommended by the EPA (2002, 2003) and IEEM (2006) on the information to be contained in ecological surveys and assessments. Habitats are classified according to Fossitt (2000). The report is based on a desk study of the area. Sources of information such as National Parks and Wildlife Service (NPWS), site synopses of sites of conservation interest (www.npws.ie) and records of rare plant and animal species (www.npws.ie) were consulted.

Consultation has previously been carried out with NPWS, Southern Regional Fisheries Board (now part of *Inland Fisheries Ireland*) and Birdwatch Ireland regarding ecological constraints in the study area and potential impacts (*Study Area Constraints Report, AOS Planning Ltd October 2010*).

3. Assessment of Route Corridors

The potential ecological impacts of each route corridor are described in a south to north direction from the substation at Ballyragget (Node 1) to the site of the proposed substation (Node 10). There are three main route corridors (western, central and eastern) and a number of other sub-route corridor options which link nodes that occur along the main corridors (see map).

Impacts associated with sites of known ecological importance have primarily been used to differentiate between the various route corridors.

There are a number of potential impacts identified that are common to each route corridor including: local disturbance to fauna during construction phase; localised disturbance and loss of habitat (at locations of angle masts and polesets); and, potential disturbance to ecology of watercourses at crossing locations. These potential impacts have also been used to aid differentiation between route corridors, mainly by considering the number of watercourse crossings required and overall length of route (and requirement for angle masts).

Western 110 kV Route Corridor (Node 1, 5,10)

Sites of ecological importance occurring within three kilometres of the Western Route Corridor are presented in Table 1.1. The southern part of the route passes primarily along the lowlands parallel to the Nore and Owenbeg River for approximately five kilometres. Further north it passes west of Ballinakill and then around the north side of Cullenagh Mountain. It is the most westerly route and is therefore closest for longer sections to the River Nore and its floodplain than the other routes. This route corridor crosses or overlaps with several sites of ecological importance (cSAC, pNHA and Nature Reserve). It also crosses several rivers and streams of fisheries importance (not all streams identified) and passes close to several sites of value to waterbirds (WS - Wetland site of importance to waterbirds. The total length of this route is ca 27.4 km.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
River Barrow & Nore	002162	cSAC	within cSAC at Ballyragget (start of route)
River Nore/Abbeyleix Woods	002076	pNHA	within pNHA at Ballyragget (start of route)
Avonmore Ponds	/	WS	Wetland bird site within 0.7 km W of corridor
River Nore floodplain (at Grange)	/	WS	Wetland bird site within 1.9 km of southern end of corridor
Glashagal River	/	River	crosses river (undesigned section) (River Nore catchment)
River Barrow & Nore	002162	cSAC	crosses Owenbeg River 2.5 km south of Ballinakill
Lisbigney Bog	000859		adjacent to E side of route corridor
Lisbigney Pond	/	WS	Wetland bird site 0.2 km east of route corridor.
Ballynakill Lake	/	WS	Wetland bird site 0.4 km west of route corridor
Mass Lough (Ballynakill)	/	WS	Wetland bird site 1.0 km west of route corridor
Gloreen Stream and tributary	/	River	crosses river (undesigned section) (River Nore catchment) Ballyroan
Cush River tributary	/	River	crosses stream (undesigned section) (River Barrow catchment) northern section
Foyle River	/	River	crosses river (undesigned section) (River Barrow catchment) northern section
Timahoe Esker	000421	River	Part of pNHA overlap with route corridor at northern end

Table 1.1: Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of the Western 110kV Route Corridor.

As with all other routes, it commences at Ballyragget close-by a very ecologically sensitive zone of the River Nore (Table 1.1), which is designated as part of the River Barrow and Nore cSAC and River Nore/Abbeyleix Woods pNHA. This stretch of the Nore (at Ballyragget) contains the rare Nore Freshwater Pearl Mussel being the only site in the world for this species. Several other species of interest are likely to use this stretch of river such as White-clawed Crayfish, Salmon, Lamprey species, Otter (all species listed on Annex II of the EU Habitats Directive), Kingfisher (bird species listed on Annex I of the EU Birds Directive), Daubenton's Bat and Brown long-eared Bat (both Red Data Book species, Marnell *et al.* 2009). Where the route occurs close-by the main watercourses there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project. The river banks and adjacent meadows may have populations of rare and protected plant species such as Autumn Crocus (Flora Protection order species) and Summer Snowflake (both Red Data Book species, Curtis & McGough 1988).

The start of the route is within 1 km of Avonmore Ponds (WS), where small numbers of Whooper Swans (*Cygnus cygnus*) (species listed on Annex I EU Birds Directive) have recently been recorded (Crushell 2010). Another site of importance to waterbirds (River Nore at Grange, overlap with cSAC) is located further south of the route corridor. Crushell (2010) identified the area to the south of Ballyragget Bridge and the lowland area between Ballyragget, Durrow and Attanagh containing the floodplains of the Rivers Nore and Owenbeg as containing habitats that waterbirds may occasionally use in winter during a preliminary assessment. Overall wintering waterbird usage of this area is low. There is likely to be some occasional movement of waterbirds from this area north along the River Nore towards other wetland sites. However, based on current data the collision risk is deemed low as the route is positioned on the east side of this potential flight corridor and does not cross any potential flight lines towards the north-west or south (and towards other wetland sites of importance to waterbirds). Crushell (2010) suggested that consideration be given to mitigation measures such as bird deflectors should the line occur close-by this part of the River Nore and at the Owenbeg River.

Further north, the route corridor crosses the Glashagal River, which is undesignated but is an important Salmonid nursery and is likely to be used by White-clawed Crayfish, Lamprey species, Otter and Kingfisher. The route corridor also crosses one river, Owenbeg, (that is designated as part of the cSAC) south of Ballynakill. This river and other undesignated tributaries further north (Gloreen) are also likely to be used by the EU Annexed species mentioned above. In the vicinity of the crossings, there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project.

Near Ballynakill the route corridor also passes close to several other sites of ecological significance, including Lisbigney Bog cSAC, Lisbigney Pond (WS), Ballynakill Lake (WS) and Mass Lough (Ballynakill) (WS). Crushell's (2010) preliminary assessment indicated that overall waterbird usage of these wetland sites (WS) was low. Based on current data, the collision risk is deemed low.

Further north towards the northern slopes of Cullenagh Mountain the route corridor also crosses several streams within the River Barrow catchment (Cush, Foyle). While these rivers are quite small they are likely to be used by species such as Otter and Kingfisher. They are Salmonid fisheries and may contain other aquatic species such as White-clawed Crayfish. Again there is potential for adverse impacts on the cSAC further downstream should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project.

The route corridor partially overlaps with the Timahoe Eskers pNHA and National Nature Reserve at the northern end. There is potential for habitat loss, fragmentation or wildlife disturbance within this site of conservation importance if pylons and power lines are erected within the designated area.

No major areas of conifer plantations or deciduous woodland have been identified along this route.

Central 110 kV Route Corridor (Node 1,2,3,4,6,7,8,9,10)

Sites of ecological importance occurring within three kilometres of the Central Route Corridor are presented in Table 1.2. The route heads North-eastwards from Ballyragget to the higher ground along the western slopes of the Castlecomber plateau. It crosses the highest part of the hills at Ballyoskill (between Node 2 and 3). From Node 3 it turns Northwards remaining on high ground until it descends somewhat at Keelagh and crosses the upper reaches of the Owenbeg River (south of Node 6). The corridor continues northwards along the eastern slopes of Cullenagh Mountain before turning eastwards at Node 9 towards the proposed substation site at Node 10. The total length of this route is ca 25.8 km).

This route corridor crosses or overlaps with several sites of ecological importance (cSAC, pNHA and Nature Reserve). It also crosses several rivers and streams of fisheries importance (not all streams identified) and passes nearby four sites of value to waterbirds (WS).

As with all other routes, it commences at Ballyragget close-by a very ecologically sensitive zone of the River Nore (Table 1.2), which is designated as part of the River Barrow and Nore

cSAC and River Nore/Abbeyleix Woods pNHA. This stretch of the Nore (at Ballyragget) contains the rare Nore Freshwater Pearl Mussel being the only site in the world for this species. Several other species of interest are likely to use this stretch of river such as White-clawed Crayfish, Salmon, Lamprey species, Otter, Daubenton's Bat and Brown long-eared Bat. Where the route occurs close-by the main watercourses there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project. The river banks and adjacent meadows may have populations of rare and protected plant species such as Autumn Crocus and Summer Snowflake.

The start of the route is within 1 km of Avonmore Ponds (WS), where small numbers of Whooper Swans have recently been recorded (Crushell 2010). A second wetland site of importance to waterbirds (River Nore at Grange, overlap with cSAC) is located further south of the route corridor. Crushell (2010) identified the area to the south of Ballyragget Bridge and the lowland area between Ballyragget, Durrow and Attanagh containing the floodplains of the Rivers Nore and Owenbeg (including the Ballyragget substation) as containing habitats that waterbirds may occasionally use during winter during a preliminary assessment. However, overall wintering waterbird usage of this area appears low. There is likely to be some occasional movement of waterbirds from this area north along the River Nore towards other wetland sites. However, based on current data the collision risk is potentially low as the route is positioned on the east side of this potential flight corridor, is orientated north-east out of the potential flight corridor towards higher ground and does not block any potential flight lines towards the north-west or south (and towards other wetland sites of importance to waterbirds).

The route crosses a small unidentified tributary of the River Nore. While this small stream is undesignated, there is potential for the stream to be used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher, and provide Salmonid nursery habitat. In the vicinity of the crossing, there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project.

Between Node 3 and Node 6, east of Ballinakill the route corridor crosses an undesignated section of the Ironmills River and other small tributary streams of the Owenbeg River. Just south of Node 6 the route crosses the upper part of the Owenbeg River which is within a narrow section of the River Barrow and Nore cSAC.

All of these watercourses are potentially used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher and are likely to provide Salmonid nursery habitat. In the vicinity of the crossings, there is potential for adverse

impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project.

The route corridor is also situated within 3 km of several other sites of ecological value, including Ballynakill Lake (WS) and Mass Lough (Ballynakill) (WS). Crushell's (2010) preliminary assessment of winter birds indicates that waterbird usage of these sites (WS) is minimal. Based on current data, the collision risk is low as the route corridor is positioned to the east of these sites and any waterbird movements are more likely to be west from these sites towards the River Nore lowlands and other wetland sites of value to waterbirds.

North of Node 6 the route crosses several small tributary streams of the Timahoe River. While these streams are quite small, there is potential for the water-courses to be used by species of conservation importance such as Otter and Kingfisher, and to provide some Salmonid nursery habitat. In the vicinity of the crossings, there is potential for adverse impacts on the cSAC further downstream should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project. The end of this route corridor also overlaps with two sections of the Timahoe Eskers pNHA. There is potential for habitat loss, fragmentation or wildlife disturbance within this site of conservation importance if pylons and / or power lines are erected within the designated area.

The Central Route Corridor overlaps with some conifer plantation/broad-leaved woodland areas.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
River Barrow & Nore	002162	cSAC	within cSAC at Ballyragget (start of route). Crosses designated section of Owenbeg River at Boleybeg.
River Nore/Abbeyleix Woods	002076	pNHA	within pNHA at Ballyragget (start of route)
Avonmore Ponds	/	WS	Wetland bird site within 0.7 km start of route
River Nore floodplain (at Grange)	/	WS	Wetland bird site within 1.4 km of start of route
Unidentified streams	/	River	crosses one small stream tributary of River Nore.
River Barrow & Nore	002162	cSAC	and 2.1 km from designated section of Owenbeg River.
Ironmills River	/	River	crosses tributary of Ironmills River (undesigned section) (River Nore catchment)
Ballynakill Lake	/	WS	Wetland bird site 2.9 km NE of route corridor
Mass Lough (Ballynakill)	/	WS	Wetland bird site 2.4 km NE of route corridor

Name	Site Code	Status	Approximate distance from corridor (nearest point)
Unidentified streams	/	River	Crosses the headwaters of several small streams (undesigned) that are tributaries of the Owenbeg River
unidentified streams	/	River	crosses several tributaries of Timahoe River (streams) (Barrow catchment)
Timahoe Eskers	000421	pNHA	overlaps with 2 sections of this pNHA and National Nature Reserve and is adjacent to another section.

Table 1.2: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of the Central Route Corridor (from Ballyragget to Loughteeg). (WS – Wetland site of importance to waterbirds).*

Eastern 110 kV Route Corridor (Node 1 – 10)

Sites of ecological importance occurring within three kilometres of the Eastern Route Corridor are presented in Table 1.3. This route takes a more southerly and easterly direction than the other identified corridors passing south of Castlecomer in Co. Kilkenny. It is the longest route (ca 44.7 km) and passes over the Castlecomer Plateau crossing much of the higher ground within the study area. This route corridor crosses or overlaps with several sites of ecological importance (cSAC, NHA, pNHA and Nature Reserve). It also crosses a number of rivers and streams of fisheries importance (not all streams identified) and passes close to two wetland sites of importance to waterbirds (WS).

Name	Site Code	Status	Approximate distance from corridor (nearest point)
River Barrow & Nore	002162	cSAC	within cSAC at Ballyragget (start of route)
River Nore/Abbeyleix Woods	002076	pNHA	within pNHA at Ballyragget (start of route)
Avonmore Ponds	/	WS	Wetland bird site within 0.7 km start of route
River Nore floodplain (at Grange)	/	WS	Wetland bird site within 1.4 km of start of route
Inchbeg	000836	pNHA	2.8 km SE of corridor at southern end
River Barrow & Nore	002162	cSAC	crosses River Glosna (part of 2162) SW of Castlecomer
River Barrow & Nore	002162	cSAC	crosses Dinin River (part of 2162) twice S of Castlecomer
Coan Bogs	002382	NHA	partially within NHA
River Kileen	/	river	crosses river (undesigned section) (River Nore catchment)
Douglas River	/	river	crosses river (undesigned section) (River Barrow catchment)
Crooked River	/	river	crosses several stream tributaries (undesigned section) (River Barrow catchment)
Cloppook Wood	000860	pNHA	1.6 km NE at northern end
Ballyprior Grassland	002256	cSAC	1.7 km E at northern end
Timahoe River	/	river	crosses river (undesigned section) (River Barrow catchment)
Timahoe Esker	000421	pNHA	overlaps with one section of pNHA & NNR at northern end

Table 1.3: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of the Eastern 110 kV Route Corridor.*

As with the other routes, it commences at Ballyragget close to a very ecologically sensitive zone of the River Nore (Table 1.3), which is designated as part of the River Barrow and Nore cSAC and River Nore/Abbeyleix Woods pNHA (overlapping designations). This stretch of the Nore (at Ballyragget) contains the rare Nore Freshwater Pearl Mussel and is the only site in the world for this species. Several other species of conservation interest are likely to use this stretch of river such as White-clawed Crayfish, Brook Lamprey, Sea Lamprey, River Lamprey, Atlantic Salmon, Otter, Kingfisher, Daubenton's Bat and Brown Long-eared Bat. In the vicinity of the crossings, there is potential for adverse impacts on the SAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project. The river banks and adjacent meadows may have populations of rare and protected plant species such as Autumn Crocus and Summer Snowflake.

The start of the route is also within 1 km of Avonmore Ponds (site of importance to wintering waterbirds WS). Small numbers of Whooper Swans have been recorded at this site during recent winter bird surveys of the study area (Crushell 2010). A second wetland site of importance to waterbirds (River Nore at Grange, overlap with cSAC) is located further south of the route corridor. Crushell (2010) identified this area to the south of Ballyragget Bridge as containing habitats that waterbirds may occasionally use in winter during a preliminary assessment. Species using this area included Little Egret, Common Gull and Lesser Black-backed Gull. Overall wintering waterbird usage of this area was low during recent counts in winter 2009-2010. There is likely to be some occasional movement of waterbirds from this area north along the River Nore towards other wetland sites. However, based on current data the collision risk is low as the route is on one side of this potential flight corridor. There are overhead lines already present at the Ballyragget substation.

Further east, the route crosses several rivers designated as part of the River Barrow and Nore cSAC (Gloshia, Dinin) and several other minor streams that are not designated but are important Salmonid nurseries and feed into the cSAC downstream. These rivers are also likely to be used by species such as White-clawed Crayfish, Salmon, Lamprey species, Otter, Daubenton's Bat and Kingfisher. Again, potential negative impacts on the SAC may result from any deterioration in water quality associated with the construction phase.

The route also crosses part of the Coan Bogs NHA (upland blanket bog). There is potential for habitat loss, fragmentation or wildlife disturbance within this site of conservation importance if pylons and power lines are erected within the designated area. Further east the route crosses several undesignated streams and rivers that are within the River Nore (Kileen) and River Barrow (Douglas, Crooked, Timahoe River) catchments. While these streams and rivers are undesignated they are also likely to contain some of the Annex II aquatic species mentioned above (such as White Clawed Crayfish), are important Salmonid fisheries and also likely to be used by species such as Kingfisher and Otter. Again, potential

negative impacts on the SAC may result from any deterioration in water quality associated with the construction phase.

Towards the northern end, the route corridor passes within 5 km of Clopook Woods pNHA and Stradbally Hills pNHA. The route corridor also overlaps with part of the Timahoe Eskers pNHA and National Nature Reserve. There is potential for habitat loss, fragmentation or wildlife disturbance within this site of conservation importance if pylons and power lines are erected within the designated area.

The Eastern Route Corridor overlaps with some conifer plantation/broad-leaved woodland areas.

Sub Corridor Node 2-4

Sites of ecological importance occurring within three kilometres of this Sub Corridor are presented in Table 1.4. This sub-corridor is located to the east and south of Ballynakill and to the east of the Owenbeg River. There is some overlap with the River Barrow and River Nore cSAC (Owenbeg River section) (Table 1.4). This section of the Owenbeg River contains Salmonid nursery habitat and is also likely to be used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher. There is potential for habitat loss, fragmentation or wildlife disturbance within the area designated as cSAC if pylons and power lines are erected within the designated area.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
Glashagal River	/	River	crosses river (undesigned section) (River Nore catchment)
River Barrow & Nore	002162	cSAC	Route corridor overlaps with cSAC along Owenbeg River east of Ballynakill
Ironmills River	/	River	crosses river (undesigned section) (River Nore catchment)
Lisbigney Bog	000859	cSAC	cSAC is 1.7 km from NE side of route corridor
Lisbigney Pond	/	WS	Wetland bird site 2.5 km NE of route corridor
Ballynakill Lake	/	WS	Wetland bird site 0.6 km NE of route corridor
Mass Lough (Ballynakill)	/	WS	Wetland bird site 1.6 km NE of route corridor

Table 1.4: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of Sub Corridor.*

The sub corridor also crosses several rivers and streams including the Glashagal River and the Ironmills River. While these rivers and streams are undesigned there is potential for the water-courses to be used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher. Both water-courses provide Salmonid

nursery habitat. In the vicinity of the crossings, there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality. These potential impacts would be associated with the construction phase of the project.

Near Ballynakill the route corridor also passes with 3 km of several other sites of ecological significance, including Lisbigney Bog cSAC, Lisbigney Pond (WS), Ballynakill Lake (WS) and Mass Lough (Ballynakill) (WS). Crushell's (2010) preliminary assessment of winter birds in the study area at wetland sites indicated that overall waterbird usage of these wetland sites was low. Based on current data, the collision risk is low as the route corridor is positioned to the east of these sites and potential waterbird movements are more likely to be west towards the River Nore lowlands and other wetland sites of value to waterbirds.

Sub Corridor Node 3-7

Sites of ecological importance occurring within 3 km of this Sub Corridor are presented in Table 1.5. This section between Node 3 and 7 is situated across some of the higher ground along the Kilkenny-Laois border to the west of Swan Village. This section does not cross or overlap with any sites of known ecological importance (cSAC, NHA, pNHA and Nature Reserve) (Table 1.5). However, the Sub Corridor does cross several small streams and tributaries of the Dinin River and an undesignated part of the upper Owenbeg River. These streams and rivers are undesignated but they are still likely to contain some Salmonid nursery habitat. There is also potential for the water-courses to be used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher. This route corridor crosses a significant area of conifer plantation.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
Unidentified streams	/	River	Crosses several undesignated tributaries of the Dinin River (Nore catchment)
Unidentified streams	/	River	Crosses an undesignated tributary of Moyadd Stream and Dinin River (Nore catchment)
Owenbeg River	/	River	Crosses headwaters of Owenbeg River (undesignated section) and a small tributary of this river.

Table 1.5: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of Sub Corridor .*

Sub Corridor Node 5-6

Sites of ecological importance occurring within 3 km of this Sub Corridor are presented in Table 1.6. This short section (ca 4.9 km) between Node 5 and 6 is situated north-east of Ballynakill, linking the Western and Central corridors.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
River Barrow & Nore	002162	cSAC	route corridor is 0.3 km of Owenbeg river (designated section NE of Ballynakill)
Unidentified streams	/	River	crosses several small stream tributaries (undesigned) of Owenbeg River
Ballynakill Lake	/	WS	Wetland bird site 0.4 km west of route corridor
Mass Lough (Ballynakill)	/	WS	Wetland bird site 1.0 km west of route corridor

Table 1.6: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of Sub Corridor.*

This Sub Corridor does not cross or overlap with any sites of known ecological importance (cSAC, NHA, pNHA and Nature Reserve) (Table 1.6). However it is situated close to the designated part of the Owenbeg River (cSAC) with the route being within 0.5 km of the river for a 2.5 km section. The route corridor also crosses several unidentified small tributaries of the Owenbeg River. While these small streams are undesigned, there is potential for the streams to be used by species of conservation importance such as White-clawed Crayfish, Lamprey species, Otter and Kingfisher, and provide Salmonid nursery habitat. In the vicinity of the crossings, there is potential for adverse impacts on the cSAC should there be any reduction in surface water quality associated with the construction phase of the project.

The southern part of the Sub Corridor is within 2 km of two wetland sites of value to waterbirds, Ballynakill Lake (WS) and Mass Lough (Ballynakill) (WS).

Sub Corridor Node 8-10

Sites of ecological importance occurring within 3 km of this Sub Corridor are presented in Table 1.7. This Sub Corridor is located at the northern end of the study area offering an alternative route on the Central Corridor from Node 8 to the proposed substation site. It takes an easterly route across lower ground and adjacent to the west side of Timahoe Village towards Loughteog. This route crosses or overlaps with the headwaters of several tributaries of the Timahoe River. While these streams are small, there is potential for the water-courses to be used by species of conservation importance such as Otter and Kingfisher, and to provide some Salmonid nursery habitat. The end of this route corridor also overlaps or crosses all four sections of the Timahoe Eskers pNHA. There is potential for habitat loss, fragmentation or wildlife disturbance within this site of conservation importance if pylons and power lines are erected within the designated area.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
unidentified streams	/	River	crosses or overlaps with several tributaries of Timahoe River (streams) (Barrow catchment)
Timahoe Eskers	000421	pNHA	overlaps with 2 sections of this pNHA and National Nature Reserve and is adjacent to another section.

Table 1.7: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of Sub Corridor.*

Sub Corridor Node 7-9

Sites of ecological importance occurring within three kilometres of this Sub Corridor are presented in Table 1.8. This Sub Corridor is located towards the northern end of the study area, offering a slightly more western approach to Node 9 along the Central Corridor. This Sub Corridor crosses the eastern side of Cullenagh Mountain. The route corridor crosses the headwaters of the Timahoe River (Table 1.8).

Name	Site Code	Status	Approximate distance from corridor (nearest point)
Timahoe River	/	River	crosses tributary of Timahoe River (stream) (Barrow catchment)
Timahoe Eskers	000421	pNHA	this pNHA and National Nature Reserve is located 1.4 km to the east of the sub corridor.

Table 1.8: *Sites of known ecological importance, as identified in the constraints report, occurring within 3 km of Sub Corridor .*

4. Selection of Preferred Route Corridor

The main criteria for the selection of a preferred route corridor are:

- (a) minimising direct and indirect impacts on sites (cSAC, pNHA, NHA, important wetland sites for waterbirds), habitats (Annex I EU Habitats Directive) and species (Annex II EU Habitats Directive, Annex I EU Birds Directive, and other species of conservation interest) of conservation importance;
- (b) minimising indirect impacts on major water-courses in the study area via runoff from other stream and river crossings; and
- (c) minimising the construction footprint and length of the overall overhead line (and requirement for angle masts).

5. Route Selection

The study area contains sites rated as being of international ecological importance, sites of national importance and a site of rare and protected species, including one species only found in the study area and nowhere else in the world (the Nore Freshwater Pearl Mussel).

Several of the proposed route corridors are likely to have some direct impacts on the River Barrow and Nore cSAC to some extent as they all cross rivers within the cSAC.

The starting point at Ballyragget is located near to the main River Nore channel and all of the potential route corridors leading from the current substation overlap with the cSAC. This area is a highly sensitive area of ecological importance and all of the route corridors have potential to have indirect impacts on river habitats and aquatic species of conservation importance via runoff affecting surface water quality during construction.

The most preferred route corridor is the Central Route Corridor. This route passes over higher ground of the Castlecomer Plateau so it is somewhat removed from the habitats and species of interest along the River Nore lowlands. This route involves a single crossing of the River Barrow and Nore cSAC. The proposed crossing is however, located at a narrow section of the cSAC (the Owenbeg River at Boleybrack). This route also crosses some minor rivers and streams in the Nore and Barrow catchments that are still likely to contain Salmonid nursery grounds and be used by species of conservation importance (e.g. Lamprey species, White-clawed Crayfish, Otter, Kingfisher). There is also increased potential for runoff during construction activities affecting aquatic species of conservation interest downstream in the catchment as this corridor passes over higher ground. However this risk can be minimised by adequate mitigation measures suggested by the Inland Fisheries Board such as avoidance of damage to fish habitat or creation of blockages, the prepared use of pre-cast concrete, the use of silt-traps to intercept runoff to streams and rivers, secure storage of fuels and the timing of any in-stream works to be carried out during July-September to minimise impacts on fish spawning.

Sub Corridor Node 2-4 is less preferred than the Central Route (Node 2-3-4) due to potential impacts arising from its proximity to the River Barrow and Nore cSAC along the Owenbeg River and required crossings of significant sections of undesignated rivers (Glashagal, Ironmills River). A high voltage power line is already present along this route Sub Corridor (Ballyragget-Castlecomer 38kv) and NPWS have advised that consideration be given to routes that already contain other existing power-lines.

Similarly the Central Route Corridor between Nodes 3-4-6-7 is more preferable than Sub Corridor Node 3-7. This Sub Corridor would remove the necessity to cross the cSAC, as the route would cross the same river (Owenbeg River) further upstream, removed from the designated part. However, this route would extend the overall length of the route and also cross a longer section of higher ground. In addition, the requirement for a greater number of Angle Masts along this corridor would increase the potential for adverse impacts.

Between Nodes 8 and 10, the Central Corridor is preferable to Sub Corridor 8-10 as it is further removed from the main part of the Timahoe Eskers pNHA, thus reducing the potential for adverse impacts on this designated site.

There are only minor differences between the Central Corridor at Node 7-8-9 and Sub Corridor Node 7-9. The Central Corridor is slightly preferred due to its occurrence on less elevated ground and shorter length.

Following the Central Route Corridor, the next most preferred route is the Western Route Corridor. This route corridor has a river crossing over the Owenbeg River that is part of the cSAC and also crosses several other undesignated streams and rivers that also contain Salmonid nursery habitat, potentially are used by EU Annexed species (e.g. Lamprey species, White-clawed Crayfish, Otter, Kingfisher), are part of the overall catchment and could direct runoff into designated sections. This route also passes adjacent to Lisbigney Bog cSAC and has potential to disturb wildlife in this area. This route corridor is also the closest corridor to the lowland area between the River Nore and Owenbeg floodplain between Ballyraggett, Durrow and Attanagh that is a site of potential value to wintering waterbirds. This zone is also more likely to contain potential flight corridors of wintering waterbirds that are moving along the River Nore floodplain.

There is an existing High Voltage Overhead line (Dunstown-Moneypoint) along part of this route and NPWS have advised that consideration be given to routes that already contain other existing overhead lines. This would minimise impacts on bird species of conservation interest that use the study area. The Inland Fisheries Board has indicated that this is their preferred route as they advised that upland routes were less preferable due to the greater potential for runoff from construction sites on slopes entering the river network.

The next most Preferred Route would be a combination of the southern part of the Western Route Corridor (Node 1-5), Sub Corridor Node 5-6 and the northern part of the Central Route Corridor (Node 6-7-8-9-10). This combination is less preferred due to the proximity of Sub Corridor Node 5 -6 to a section of the River Barrow to Nore SAC.

The least preferred route corridor is Eastern Route Corridor. This eastern route is the longest route and would have the greatest construction footprint. There are two crossings over rivers designated as part of the River Barrow and Nore cSAC. Furthermore, there are several crossings over other watercourses that also contain Salmonid nursery habitat and are potentially used by EU Annexed species (e.g. Lamprey species, White-clawed Crayfish, Otter, Kingfisher). These other watercourses lie within the overall catchment and could direct runoff into designated sections. This route also crosses directly over Coan Bog NHA.

In conclusion, following a desktop ecological assessment of the different Route Corridors, the most preferred option is deemed to be the Central Route Corridor (Node 1-2-3-4-6-7-8-9-10).

Appendix I

Site evaluation scheme is taken from NRA (2006).

A	<p>Internationally important</p> <p>Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives.</p> <p>Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive.</p> <p>Major salmon river fisheries.</p> <p>Major salmonid (salmon, trout or char) lake fisheries.</p>
B	<p>Nationally important</p> <p>Sites or waters designated or proposed as an NHA* or statutory Nature Reserves.</p> <p>Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive).</p> <p>Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000.</p> <p>Major trout river fisheries.</p> <p>Water bodies with major amenity fishery value.</p> <p>Commercially important coarse fisheries.</p>
C	<p>High value, locally important</p> <p>Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species.</p> <p>Small water bodies with known salmonid populations or with good potential Salmonid habitat.</p> <p>Sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive.</p> <p>Large water bodies with some coarse fisheries value.</p>
D	<p>Moderate value, locally important</p> <p>Sites containing some semi-natural habitat or locally important for wildlife.</p> <p>Small water bodies with some coarse fisheries value or some potential salmonid habitat.</p> <p>Any water body with unpolluted water (Q-value rating 4-5).</p>
E	<p>Low value, locally important</p> <p>Artificial or highly modified habitats with low species diversity and low wildlife value.</p> <p>Water bodies with no current fisheries value and no significant potential fisheries value.</p>

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