

9 Flora, Fauna and Fisheries

9.1 Methodology

Information on flora, fauna and fisheries sites has been collected by NATURA (Natural Environment Consultants Ltd) and this information is shown on Figures 12 to 14 (Drawings 00229/028 to 00229/30). Designated conservation areas were identified from the Dúchas database of sites. Additional sensitive ecological sites were identified within the study area using satellite imagery (Landsat Thematic Mapper false colour images of May 2000/April 1995). Different habitats and vegetation types have characteristic colour signatures on the false colour satellite images and this allows sites of potential ecological value to be identified and mapped. Images were interpreted at a scale of 1:50,000. The resolution of the smallest unit area of the image is 30x30m. While satellite imagery provides a good overview of landuse and habitat types in the study area, it is not possible to undertake detailed evaluations of ecological sites from satellite imagery alone. Only limited information can be given on the habitats present and their ecological value. Recent aerial photographs (summer 2000) were used to check ecological sites identified from satellite images and to identify some additional sites. However, detailed interpretation of the aerial photographs was not undertaken at the constraints stage. Areas of intensively managed farmland contain few habitats, apart from hedgerows, that are important for flora and fauna. Hedgerows are important for wildlife at a local level and are widespread throughout the study area so are not considered further in this report. Some sites of ecological value may have been overlooked owing to the size of the area under investigation, the scale of the mapping and the resolution of the satellite imagery.

Dúchas was consulted in relation to records of rare and protected plant species in the study area. Important sites for wetland birds were identified from the Irish Wetland Bird Survey (I-WeBS) reports. The fisheries value of the main rivers was determined by consultation with the Southern Regional Fisheries Board.

Information on the occurrence of protected freshwater species (listed in Annex II of the EU Habitats Directive) was derived from the literature.

9.2 Assessment criteria

Ecological sites and fisheries waters were assessed according to the criteria for site evaluation outlined in Table 9.1. The constraints study is concerned with sites of international to regional importance (A/B sites), and with sites of local importance (C/D sites). As it is not possible to evaluate ecological sites and habitats from satellite images, no distinction has been made between sites of high local value (C sites) and those of low local value (D sites). These sites will be evaluated at the route selection stage on the basis of field surveys.

9.3 Designated conservation areas

One proposed candidate Special Area of Conservation (pcSAC) and 13 proposed Natural Heritage Areas (pNHA) occur within the northern study area. These sites are listed in Table 9.2, together with a brief site description and a summary of the main conservation interests, including rare and protected species.

River Barrow and River Nore pcSAC cuts diagonally through the south-western corner of the study area, and comprises a short stretch of the River Nore together with the associated bankside habitats. Two pNHAs overlap with River Barrow and River Nore pcSAC; Dunmore Complex and Ardaloo Fen are essentially sub-sites of the larger pcSAC. The pNHAs are typically small and have a scattered distribution. Most are either wetland sites or are associated with rivers, canals or open water bodies (lakes or ponds). Exceptions include Ballycore Rath and Ballymoon Esker which support areas of dry semi-natural grassland, and Dunmore Cave which is used by bats.

Special Area of Conservation (SAC) is a statutory designation which has a legal basis under the EU Habitats Directive (92/43/EEC) as transposed into Irish law through the European Communities (Natural Habitats) Regulations, 1997. The main implication of this designation is that any project likely to have a significant adverse impact on the integrity of the pcSAC may only be carried out for “*imperative reasons of overriding public interest, including those of a social or economic nature*”.

Natural Heritage Area (NHA) is a non-statutory designation at present but is expected to become a statutory designation when the Wildlife Act, 1976, is amended. Most local authority development plans include an objective to protect NHAs within their jurisdiction so this gives the designation some legal status under the Local Government (Planning and Development) Act, 1992. An application for planning permission for any development that may have impacts on an NHA will be referred by the planning authority to Dúchas, The Heritage Service for comment.

9.4 Rare and protected plant species

There are numerous records of rare and protected plant species from within the study area. Rare plants that occur in designated conservation areas are listed in Table 9.2. Other rare plant sites with recent records (post-1950) and specific locations are listed in Table 9.3. In addition to these, the Dúchas database contains another 43 records of rare plants that may occur within the study area. However, as these records are old (mostly pre-1900) and the locations of the sites are vague (given as 10km squares only), they have not been included in this report.

9.5 Sites of ecological value

A total of 124 ecological sites were identified in the northern study area in addition to the designated conservation areas listed in Table 9.2. These sites are listed in Appendix B, together with a brief site description. Only limited information can be given on the habitat types present as sites were identified from satellite imagery at a scale of 1:50,000. Site visits would be required to establish the full range of habitats present and their ecological significance. The ecological sites are shown on the Drawings.

Ecological sites have an uneven distribution in the study area and are mainly found along river valleys and in upland areas. The main habitats occurring in these sites include woodland, scrub, unimproved grassland (wet and dry) and wetland areas associated with streams and river floodplains. There are a number of peatland sites (raised bog and cutover bog) between Monasterevin and Athy, in the north-western arm of the study area. In general, the areas of intensive agricultural land, including arable land and improved grassland, have few sites of ecological value. Many of the ecological sites within the study area are comparatively small.

9.6 Important bird sites

Three sites in the study area are important for wetland birds and at two of these, River Barrow and Oakpark Lake, Irish Wetland Bird Survey (I-WeBS) counts are made annually. The most recent I-WeBS data for these two sites are given in Table 9.4 (Colhoun, 2001). Oakpark Lake is also a pNHA (see Table 9.2). The third site is the sugar factory settling ponds near Carlow.

9.7 The aquatic environment

The study area contains a number of important rivers as listed in Table 9.5. Most of these are part of the Barrow system. Rivers in the south-west of the study area are part of the Nore system. The main channel of the River Barrow dissects the northern study area and flows approximately 47km in a south to south-easterly direction, passing through Athy, Carlow and Muinebheag. A section of the Barrow Line of the Grand Canal (a pNHA – see Table 9.2) runs roughly parallel to the river from the western boundary as far as Athy, a distance of approximately 7km. The main tributaries of the River Barrow are Tully Stream and the Greese, Burren and Lerr rivers. Approximately 11km of the main channel of the River Nore occurs in the south-western corner of the study area, and is designated as a pcSAC. The Dinin River is the main tributary.

The Nore is extremely important for salmonid fish and is a Designated Salmonid River under the EU Freshwater Fish Directive. Salmonid fish occur in all the main watercourses in the study area. The main channels of the Barrow, Nore and their larger tributaries are primarily adult salmonid waters. The Barrow is also noted for the quality of its coarse angling at a number of locations.

The three species of lamprey that occur in Ireland are legally protected under the EU Habitats Directive (listed in Annex II). Lampreys (unspecified) have been observed in the upper reaches of the Barrow and Greese rivers, in the lower reaches of the Burren River, and in the Palatine Stream (Kurz and Costello, 1999). Brook lamprey occur throughout the Barrow catchment. Brook and sea lamprey appear to be common in the Nore catchment. The main channel of the Nore is a good spawning area for sea lamprey because it is fast-flowing with a gravelly bottom. Sea lamprey usually spawn downstream of Thomastown but occasionally they spawn as far upstream as Ballyragget. Unspecified ammocoetes (lamprey larvae) have been observed in the upper and middle reaches of the Nore main channel and in the lower reaches of the Dinin River. River Barrow and River Nore pcSAC is noted for the presence of all three lamprey species and twaite shad, all of which are listed in Annex II of the EU Habitats Directive (see Table 9.2).

Two freshwater invertebrates that are legally protected under the EU Habitats Directive (listed in Annex II), white-clawed crayfish (*Austropotamobius pallipes*) and freshwater pearl-mussel (*Margaritifera margaritifera* and *M. margaritifera durrovensis*), occur in River Barrow and River Nore pcSAC. There are records of white-clawed crayfish from the following 10km grid squares within the study area: N60, N61, S56, S57, S76, S77 and S78 (Reynolds, 1998). River Barrow and River Nore pcSAC also contains otter, a legally protected species listed in Annex II of the EU Habitats Directive. Otter are likely to be widespread along most rivers in the study area.

9.8 Summary and Conclusions

There are 14 designated conservation areas for flora and fauna within the study area. One of these is a proposed candidate Special Area of Conservation (pcSAC), and 13 are proposed Natural Heritage Areas (pNHA). River Barrow and River Nore pcSAC cuts across the south-western corner of the study area and any crossing of this 7km stretch of the River Nore should be avoided. As most of the pNHAs are small and have a scattered distribution, it should be possible to avoid any direct impact on these sites. In the case of a pcSAC, projects that are likely to have a significant adverse impact on the integrity of the site may only be carried out for "*imperative reasons of overriding public interest, including those of a social or economic nature*".

Consultations with Dúchas, the Heritage Service will be required if any pNHAs are affected by this scheme.

There are 124 additional ecological sites in the study area. These are concentrated in upland areas and along river corridors, but scattered sites have a more widespread distribution. Most of these ecological sites are comparatively small and should be avoided where possible. If sites cannot be avoided then mitigation will be required.

Numerous watercourses occur in the study area and most of these are important for fisheries. The River Barrow dissects the study area from north to south and will have to be crossed by the proposed road at some point. Particular attention will be required in the selection of crossing points for any watercourse to avoid,

where possible, designated conservation areas, other ecological sites and stretches of the channel that are of high fisheries value and/or contain protected freshwater species listed in Annex II of the EU Habitats Directive.

All river and stream crossings should be treated with care and should be the subject of consultation with the Southern Regional Fisheries Board. Single span bridges for rivers and bottomless culverts for streams are recommended as they have the least impact on fish and macro-invertebrate populations, and on the stream or river habitat.

9.9 References

The following references have been consulted:

- Colhoun, K. (2001). *Irish Wetland Bird Survey 1998-99*. BirdWatch Ireland, Dublin.
- Curtis, T. G. F. and McGough, H. N. (1988). *The Irish Red Data Book. 1. Vascular plants*. The Stationery Office, Dublin.
- Dwyer, R. B. (2000). *Protecting nature in Ireland. The NGO Special Areas of Conservation shadow list*. Irish Peatland Conservation Council, Dublin.
- Kurz, I. and Costello, M. J. (1999). *An outline of the biology, distribution and conservation of lampreys in Ireland*. Irish Wildlife Manuals No. 5. Dúchas, the Heritage Service, Dublin.
- Moorkens, E. A. (1999). *Conservation management of the freshwater pearl mussel Margaritifera margaritifera. Part 1: Biology of the species and its present situation in Ireland*. Irish Wildlife Manuals No. 8. Dúchas, the Heritage Service, Dublin.
- Reynolds, J. D. (1988). *Conservation management of the white-clawed crayfish Austroptamobius pallipes*. Irish Wildlife Manuals No. 1. Dúchas, the Heritage Service, Dublin.
- Whilde, A. (1993). *Irish Red Data Book 2: Vertebrates*. HMSO, Belfast.

**Table 9.1 : Evaluation of sites for Flora, Fauna and Fisheries
in route corridor assessment**

Rating	Importance of ecological sites	Importance of fisheries waters
A	Internationally important Site qualifying for designation as proposed SAC or SPA, therefore subject to the EU Habitats Directive	Internationally important Designated salmonid waters under the EU Freshwater Fish Directive. Rivers designated as SACs for Annex II freshwater species
B	Nationally or regionally important Site listed as proposed NHA or containing habitats which are nationally or regionally rare	Nationally important Other major salmonid waters
C	High value, locally important Sites containing semi-natural habitat types with high biodiversity. High degree of naturalness. Locally rare habitats or species	High value, locally important Small streams with known salmonid populations. Larger waters with some fisheries value
D	Low value, locally important Artificial habitats which provide some secondary wildlife habitat of local value	Low value, locally important Small streams without known salmonid populations
E	Very low value Modified sites or sites with very low habitat diversity	Very low value Polluted waterways with no current fisheries value.
F	Unknown value Sites of possible ecological value which require further investigation at optimum season to establish importance	Unknown value Sites of possible fisheries value requiring further survey

Table 9.2 : Designated conservation areas within the northern section of the N9/N10 Kilcullen-Waterford route corridor

Site name	Code	Status	General site description/main habitat types/rare species
River Barrow and River Nore	2162	pcSAC	Long, narrow site incorporating the river corridors and associated bankside habitats of the Barrow, Nore and parts of some of the main tributaries. Important for five Annex I habitats: floating river vegetation (3260), *alluvial forests (91E0), *old sessile oak woods (91A0), *petrifying springs (7220) and salt meadows (1330) Vascular plants: meadow saffron, nettle-leaved bellflower, Borrer's saltmarsh grass, hemp nettle, meadow barley, opposite-leaved pondweed, ivy broomrape, greater broomrape, saw-wort, bird cherry, Killarney fern Mammals: otter, Daubenton's bat Birds: Greenland white-fronted goose, whooper swan, Bewick's swan, kingfisher, peregrine. (I-WeBS count site) Fish: salmon, twaite shad, smelt, brook lamprey, river lamprey, sea lamprey Invertebrates: white-clawed crayfish, freshwater pearl mussel (<i>Margaritifera margaritifera</i> , <i>M. margaritifera durrovensis</i>)
Grand Canal	2104	pNHA	Main channel and banks of the Grand Canal, Barrow Line. Habitats include calcareous grassland, reedswamp, scrub and woodland. Proposed on the NGO shadow list (Dwyer, 2000) as an SAC for the Annex I priority habitat, *species-rich calcareous grassland (6210)
Barrow Valley at Tankardstown Br.	0858	pNHA	Site comprising sections of the River Barrow and Grand Canal channels and associated semi-natural grassland and wetland habitats
Ballylynan	0857	pNHA	Series of wet meadows supporting rank, calcareous grassland
Ballycore Rath	1751	pNHA	Unimproved grassland, small woodland stands and a rath on the slopes of a moraine
Oakpark Lake	0810	pNHA	Shallow artificial lake surrounded by reedswamp and broadleaved woodland. Important for breeding and wintering waterfowl Birds: golden plover. (I-WeBS count site)
Cloghrick Wood	0806	pNHA	Mixed broadleaved/conifer woodland fringing the River Barrow
Newpark Marsh	0845	pNHA	Small marshy area with fen vegetation used as a feeding site by bats Mammals: Leisler's bat, brown long-eared bat, pipistrelle bat
¹ Dunmore Complex	1859	pNHA	Mosaic of wetland, woodland, old meadow and disturbed habitats in a series of depressions in gravels and boulder clays Vascular plants: nettle-leaved bellflower, basil thyme Lower plants: <i>Ricciocarpus fluitans</i> (liverwort)
¹ Ardaloo Fen	0821	pNHA	Wetland area beside the Neunna River that supports wet grassland and reedswamp
Esker Pits	0832	pNHA	Disused gravel pits with a mosaic of wet and dry habitats Vascular plants: Blue fleabane
Dunmore Cave	0401	pNHA	Limestone cave open to the public and used as a roosting site by bats Mammals: Natterer's bat
Lough Macask	1914	pNHA	Small pond that fluctuates in size. Important for aquatic plants
Ballymoon Esker	0797	pNHA	Unimproved calcareous grassland on an esker ridge with important populations of two rare plants. Proposed on the NGO shadow list (Dwyer, 2000) as an SAC for the Annex I priority habitat, *species-rich calcareous grassland (6210) Vascular plants: green-winged orchid, basil thyme

¹ = sites that overlap with, or are sub-sites of River Barrow and River Nore pcSAC 2162
pcSAC = proposed candidate Special Area of Conservation
pNHA = proposed Natural Heritage Area

Annex I = list of habitats of conservation importance in the EU Habitats Directive

* = Annex I priority habitat (in danger of disappearance)

I-WeBS = Irish Wetland Bird Survey

Rare and protected species include those listed in the Flora Protection Order, 1999, in the Irish Red Data books for vascular plants (Curtis and McGough, 1988) and vertebrates (Whilde 1993), and in Annex I of the EU Birds Directive.

Table 9.3 : Rare plant records for sites in the study area, excluding those from designated conservation areas (see Table 9.2)

Plant name	County	Location of site	Grid ref.	Last seen	Status
Blue fleabane <i>Erigeron acer</i>	Kilkenny	Roadstone gravel pits north of Kilkenny	S50 58	1991	V
Blue fleabane <i>Erigeron acer</i>	Kilkenny	Near the railway station in Kilkenny	S504560	1994	V
Blue fleabane <i>Erigeron acer</i>	Carlow	Gravel pits on both sides of the Barrow near Muine Bheag	S69 59	1991	V
Blue fleabane <i>Erigeron acer</i>	Carlow	Clonmelsh Pit east of Milford	S72 70	1991	V
Musk thistle <i>Carduus nutans</i>	Carlow	North-east of Carlow town near the Dublin road	S735778	1993	IN

Red Data Book categories: V = Vulnerable; IN = Indeterminate

Table 9.4 : I-WeBS data for sites in the study area.

Counts are given as the sum of the annual maxima of each species.

Site name	94/95	95/96	96/97	97/98	98/99	5yr mean
River Barrow	1779	2675	2082	1945	1870	2070
Oakpark Lake	550	742	798	483	501	615

Table 9.5 : Fisheries value of the main water bodies in the study area.

For details of criteria used in rating fisheries waters see Table 9.1.

Name	Channel type	Fisheries value/protected fauna	Rating
Barrow catchment			
River Barrow	Main channel	Good stock of brown trout. Salmon, bream and pike also present. Lamprey (unspec.) in the upper reaches	A
Tully Stream	Tributary	Contains salmonids	C
Athy Stream	Tributary	Contains salmonids	C
River Greese	Tributary	Good stock of brown trout. Lamprey (unspec.) in upper reaches <i>Two main tributaries:</i> Grangecon Stream and Burtown Stream	B

Name	Channel type	Fisheries value/protected fauna	Rating
Levitstown Stream	Tributary	Contains salmonids	C
Grange Stream	Tributary	Contains salmonids	C
River Douglas	Tributary	Important spawning area for salmonids	B
Fuer River	Tributary	Contains salmonids	C
Lerr River	Tributary	Important for salmonids. <i>Three main tributaries:</i> Palatine Stream, Graney River and Fushoge River. Lamprey (unspec.) in Palatine Stream	B
Burren River	Tributary	Contains salmonids. Lamprey (unspec.) in the lower reaches	C
Ballynabole Stream	Tributary	Contains salmonids	C
Oldleighlin Stream	Tributary	Contains salmonids	C
Monefelim River	Tributary	Contains salmonids	C
Gowran River	Tributary	Contains salmonids	C
Nore catchment			
River Nore	Main channel	Designated Salmonid Water. Proposed as an SAC for salmon (Dwyer, 2000). Good stocks of brown trout. Brook and sea lamprey common; sea lamprey spawn between Thomastown and Inistioge. Records of white-clawed crayfish and freshwater pearl mussel.	A
Dinin River	Tributary	Important for salmonids. Lamprey (unspec.) in the lower reaches. <i>Four main tributaries:</i> Clogh, Cloghnagh and Muckalee rivers, Castlecomer Stream.	B
Pococke Stream	Tributary	Contains salmonids	C

Sources: Southern Regional Fisheries Board, Reynolds (1998), Kurz and Costello (1999), Dwyer (2000)