

**Appropriate Assessment Screening
Renovation of terraced houses
Barrack Street,
Carlow,
Co. Carlow.**

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Introduction and Terms of Reference

Introduction

This is an appropriate assessment screening for the proposed renovation of a terrace of currently derelict, roofless house on Barrack Street in Carlow. The façade of the existing terrace will be preserved.

Screening for Appropriate Assessment

This screening for appropriate assessment has been carried out in accordance with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) and in line with the Guidance for Planning Authorities entitled “Appropriate Assessment of Plans and Projects in Ireland” as published by the Department of the Environment, Heritage and Local Government in December 2009.

The 1992 Habitats Directive requires member states to designate areas of their territory containing a representative sample of important habitats and species. These areas are known as Natura 2000 sites, and in Ireland they include Special Areas of Conservation (SAC’s) and Special Protection Areas (SPA’s). Article 6(3) and (4) require that an Appropriate Assessment be carried out for these sites where projects, plans or proposals are likely to have an effect on the protected site.

Article 6(3) of the Habitats Directive states: ‘any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public’.

Article 6(4) states: ‘if, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of economic or social nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species the only

considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest’.

Methodology

The methodology as set out in Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (December 2009) has been followed.

Stage 1: The aim of Stage 1, ‘Screening’ is to determine whether or not Stage 2, the Appropriate Assessment is required, i.e. to determine whether or not the Plan is likely to negatively affect the conservation objectives on any Natura 2000 site. This is done by examining the design of the proposed project; and the conservation objectives of any Natura 2000 sites that might potentially be affected.

Stage 2: The aim of the ‘Appropriate Assessment’ proper, is to identify any significant negative impacts that the plan might have upon Natura 2000 sites and to propose changes to the project design that will avoid any such negative impacts. The project design should then be amended accordingly, thereby avoiding the need to progress to Stage 3, which would require the implementation of measures to mitigate or compensate for the identified negative impacts on Natura 2000 sites. A key consideration of Appropriate Assessment is that the Plan or Project under consideration must take account of potential impacts on Natura 2000 sites ‘in combination’ with other plans or projects.

Stage 3: Alternative Solutions Following a Stage 2 negative result, that is, adverse effects cannot be excluded; an examination of alternative solutions or options, described in Article 6(4) of the Directive should be examined. These alternative solutions which should have been identified in the appropriate assessment stage should then return to be reassessed by a Stage 2 appropriate assessment, similar to a new plan or a variation of an existing plan. Alternatively, should no alternative solution which does not adversely effect a Natura 2000 site be identified, the ‘least damaging’ option should be considered with regard to Stage 4.

Stage 4: Imperative Reasons of Overriding Public Interest (IROPI) / Derogation Described as the derogation process of Article 6(4), this final stage allows for the plan or project to proceed in the knowledge that it will have adverse effects on the conservation objectives and as a consequence the integrity of a Natura 2000 site. This is essentially an assessment of the compensatory measures which should be proposed to offset damage to the site and should be practical, implementable, enforceable and approved by the Minister and referred to the European Commission.

In accordance with this guidance, the following four steps have been used to produce this stage 1 screening statement at which the necessary amendments to the proposed plan will be identified:

- Description of project and project area characteristics
- Identification of Natura 2000 sites and compilation of information on their qualifying interests and conservation objectives.
- Assessment of Likely Effects
- Screening conclusion and statement.

Stage 1 Screening

Description of project and project area characteristics -

Habitats were identified using “Guide to Habitats in Ireland”, Fossitt J., Heritage Council 2000.

The proposed development subject of this appropriate assessment screening is the renovation of a terrace of two storey derelict and roofless houses on barrack Street in Carlow. The existing façade of the terraced houses will be preserved. There are no works proposed other than what is reasonably required to facilitate the renovation. All consequent foul and grey water will be directed to existing waste water sewers for treatment by Irish Water at the treatment works. The proposed development occupies a site that is within 1 km of the River Barrow. The River Barrow is a constituent of the River Barrow/Nore Special Area of Conservation (SAC).

The habitat on-site consists of:

Buildings and Artificial Surfaces (BL3).

Birds

Birds which were all seen, heard (or can be expected to occur;), Grey wagtail (*Motacilla cinerea*), Thrush (*Turdus philomelos*), Blackbird (*Turdus merula*), Blue Tit (*Parus caeruleus*), Great Tit (*Parus major*), Chaffinch (*Fringilla coelebs*), Magpie (*Pica pica*), Jackdaw (*Corvus monedula*), , Rook (*Corvus frugilegus*), Robin (*Erithacus rubecula*), Starling (*Sturnus vulgaris*), Wren (*Troglodytes troglodytes*), Dunnock (*Prunella modularis*), Woodpigeon (*Columba palumbus*), House Sparrow (*Passer domesticus*).

Mammals

Rat (*Rattus norvegicus*), Mouse (*Mus musculus*).

Identification of Natura 2000 sites and compilation of information on their qualifying interests and conservation objectives.

There is one Special Areas of Conservation (SAC) within the possible impact zone of the site, as set out for plans in the Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities;

River Barrow and River Nore SAC site code 002162

Generic Conservation objectives: Detailed objectives to follow.

Generic objectives can be stated as follows:

- Avoid deterioration of the habitats of the qualifying species and species of special conservation interest or significant disturbance to these species thus ensuring the integrity of the sites are maintained.

- To ensure for the qualifying species and species of special conservation interest that the following are maintained in the long-term:
 - (1) The population of the species as a viable component of the site
 - (2) The distribution and extent of habitats supporting the species

Qualifying species and habitats:

1016 Desmoulin's whorl snail *Vertigo moulinsiana*
 1029 Freshwater pearl mussel *Margaritifera margaritifera*
 1092 White-clawed crayfish *Austropotamobius pallipes*
 1095 Sea lamprey *Petromyzon marinus*
 1096 Brook lamprey *Lampetra planeri*
 1099 River lamprey *Lampetra fluviatilis*
 1103 Twaite shad *Alosa fallax*
 1106 Atlantic salmon (*Salmo salar*) (only in fresh water)
 1130 Estuaries
 1140 Mudflats and sandflats not covered by seawater at low tide
 1310 *Salicornia* and other annuals colonizing mud and sand
 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)
 1355 Otter *Lutra lutra*
 1410 Mediterranean salt meadows (*Juncetalia maritimi*)
 1421 Killarney fern *Trichomanes speciosum*
 1990 Nore freshwater pearl mussel *Margaritifera durrovensis*
 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation
 4030 European dry heaths
 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
 7220 * Petrifying springs with tufa formation (*Cratoneurion*)
 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
 91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
 Source NPWS accessed 11/10/20

Natura 2000 sites

Site Name	Area reduction	Disturbance	Fragmentation	Density reduction	Water Quality Modification
002162 River Barrow And River Nore SAC	None anticipated	None anticipated	None anticipated	None anticipated	None anticipated

Measures at design stage that will prevent negative impacts on Natura sites within the potential impact zone:

Potential impacts on Natura 2000 sites from the proposed development are largely restricted to discharge of surface and foul water from the site. All foul water from the site eventually discharges to the waste water treatment works and then disposal, and therefore will not impact on the habitats of the Natura sites within the 15km threshold distance.

The surface water discharged will be passed through a hydrocarbon interceptor before entry to sewer network and consequentially there will no net increase in quantity of water discharging into the local waste sewer network or the quality.

All activities and storage of materials will be carried out in such a way as to minimise impact. All vehicles will be refuelled on a bunded surface. This will prevent fouling of road surfaces and subsequent discharge to gully traps in the roads.

The contractor's compound and temporary fencing required by the contractor for his use during this contract shall be removed completely by the contractor on completion of the works and re-instated to the architect/engineer's satisfaction.

The sequence of work generally is subject to agreement before commencement on site.

.No works shall take place after 20.00 hrs each Day.

Pollution:

Prevention: Protect the site, the works and the general environment (including streams and waterways) against pollution.

Contamination: If pollution occurs, report immediately, including to the appropriate authorities, and provide relevant information.

Netting will be used around the buildings during construction/demolition to intercept possible dust and debris arising.

Pesticides: Use: Not permitted.

Asbestos Containing Material

Duty: Report immediately any suspected materials discovered during execution of the works.

Do not disturb.

Agree methods for safe removal or encapsulation.

Notification: To the HSA 28 days before any asbestos is removed.

Dangerous or Hazardous Substances

Duty: Report immediately suspected materials discovered during execution of the works.

. Do not disturb.

. Agree methods for safe removal or remediation.

Fire Prevention

Duty: Prevent personal injury, death, and damage to the Works or other property from fire.

Standard: Comply with Joint Code of Practice 'Fire Prevention on Construction Sites', published by Construction Industry Publications and The Fire Protection Association (The "Joint Fire Code").

Burning on Site: Burning on site not permitted.

Waste: Includes rubbish, debris, spoil, containers and packaging, and surplus material requiring disposal.

Requirement: Minimize production and prevent accumulation of waste. Keep the site and works clean and tidy. Clean out voids and cavities in the construction before closing.

Disposal: Collect and store in suitable containers. Remove from site and dispose of in a safe and competent manner, as approved and directed by the waste regulation authority.

Recyclable material: Sort and dispose of at a materials recycling facility approved by the waste regulation authority.

Documentation: Retain on-site.

Removal contractors must hold: A waste collection permit issued by the waste management authority.

A license issued by the Environment Protection Agency (EPA) for specified waste recovery and disposal activities.. A permit from a local authority or certificate of registration from the EPA/ local authority.

Invasive Species

General: Prevent the spread of species (e.g. plants or animals) that may adversely affect the site or works economically, environmentally or ecologically.

Duty: Report immediately any suspected invasive species discovered during execution of the works.

. Do not disturb. Agree methods for safe eradication or removal.

Roads and Footpaths:

Duty: Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.

Damage caused by site traffic or otherwise consequent upon the Works: Make good to the satisfaction of the Employer, Local Authority or other owner.

Wildlife Species and Habitats

Protected habitats and species: Upon discovery immediately advise. Do not proceed until instruction is received.

Education: Ensure that employees and visitors to the site receive suitable instruction and awareness training.

Predicted and Residual impact of the proposal

No impact on Natura 2000 sites is anticipated.

Assessment of Likely Effects

Potential impacts on Natura 2000 sites from the proposed development are not anticipated.

Based on the available information and data is not expected that the proposed project will cause any impact on the SAC's or SPA's located within 15 km of the project site. It is of such a scale that it will cause neither change nor have any significant adverse direct, indirect or secondary impacts on the integrity of any Natura 2000 sites within the threshold distance.

More specifically, there will be no reduction in habitat area; no disturbance of key species, habitat or species fragmentation; no reduction in species density; no changes in key indicators of conservation value, no change in water quality and no climate change brought about to the SAC and SPA sites within the 15 kms zone.

Screening Conclusion and Statement

This process was carried out to ascertain if the project was likely to have significant effects on the Natura 2000 sites within the threshold distance of the project site. It is of such a scale that it will cause neither change nor have any significant adverse direct, indirect or secondary impacts on the integrity of any Natura 2000 sites within the threshold distance.

More specifically, there will be no reduction in habitat area; no disturbance of key species, habitat or species fragmentation; no reduction in species density; no changes in key indicators of conservation value, no change in water quality and no climate change brought about to the SAC and SPA sites within the 15 kms zone.

Following the review of the project in accordance with the Guidance for Planning Authorities entitled "Appropriate Assessment of Plans and Projects in Ireland", this screening has established that the project poses no potential for significant effects and as such requires no further appropriate assessment.

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Appendix

Special Areas of Conservation

Site Name: River Barrow and River Nore SAC

Site Code: 002162

This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King’s Rivers on the Nore.

Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1130] Estuaries

[1140] Tidal Mudflats and Sandflats

[1170] Reefs

[1310] Salicornia Mud

[1330] Atlantic Salt Meadows

[1410] Mediterranean Salt Meadows

[3260] Floating River Vegetation

[4030] Dry Heath

[6430] Hydrophilous Tall Herb Communities

[7220] Petrifying Springs*

[91A0] Old Oak Woodlands Version date: 9.2.2016 2 of 7 002162_Rev16.Docx

[91E0] Alluvial Forests*

[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)

[1092] White-clawed Crayfish (*Austropotamobius pallipes*)

[1095] Sea Lamprey (*Petromyzon marinus*)

[1096] Brook Lamprey (*Lampetra planeri*)

[1099] River Lamprey (*Lampetra fluviatilis*)

[1103] Twaité Shad (*Alosa fallax*)

[1106] Atlantic Salmon (*Salmo salar*)

[1355] Otter (*Lutra lutra*)

[1421] Killarney Fern (*Trichomanes speciosum*)

[1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)

Good examples of alluvial forest (a priority habitat on Annex I of the E.U. Habitats Directive) are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Rusty Willow (*S. cinerea* subsp. *oleifolia*), Crack Willow (*S. fragilis*) and Osier (*S. viminalis*), along with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*).

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

The best examples of old oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the 16th 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*. The rare Myxomycete fungus, *Licea minima* has been recorded from woodland at Abbeyleix.

Oak woodland covers parts of the valley side south of Woodstock and is well developed at Brownsford where the Nore takes several sharp bends. The steep valley side is covered by oak (*Quercus* spp.), Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*) and Downy Birch (*Betula pubescens*), with some Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). All the trees are regenerating through a cover of Bramble (*Rubus fruticosus* agg.), Foxglove (*Digitalis purpurea*), Great Wood-rush (*Luzula sylvatica*) and Broad Buckler-fern (*Dryopteris dilatata*). On the steeply sloping banks of the River Nore, about 5 km west of New Ross, in Co. Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of relatively undisturbed, relict oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown, a small, mature oak dominated woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Common Cow-wheat (*Melampyrum pratense*) and Bracken (*Pteridium aquilinum*). Borris Demesne contains a very good example of a semi-natural broadleaved woodland in very good condition. There is quite a high degree of natural re-generation of oak and Ash through the woodland. At the northern end of the estate oak species predominate. Drummond Wood, also on the Barrow, consists of three blocks of deciduous woods situated on steep slopes above the river. The deciduous trees are mostly oak species. The woods have a well-established understorey of Holly, and the herb layer is varied, with Bramble abundant. The whitebeam *Sorbus devoniensis* has also been recorded here. Eutrophic tall herb vegetation occurs in association with the various areas of alluvial forest and elsewhere where the floodplain of the river is intact. Characteristic species of the habitat include Meadowsweet, Purple Loosestrife (*Lythrum salicaria*), Marsh Ragwort (*Senecio aquaticus*), Ground Ivy (*Glechoma hederacea*) and Hedge Bindweed (*Calystegia sepium*). Indian Balsam (*Impatiens glandulifera*), an introduced and invasive species, is abundant in places. Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include water-starworts (*Callitriche* spp.), Canadian Pondweed (*Elodea canadensis*), Bulbous Rush (*Juncus bulbosus*), water-milfoils (*Myriophyllum* spp.), the pondweed *Potamogeton x nitens*, Broad-leaved Pondweed (*P. natans*), Fennel Pondweed (*P. pectinatus*), Perfoliated Pondweed (*P. perfoliatus*) and crowfoots (*Ranunculus* spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996). Dry heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken and Gorse (*Ulex europaeus*) with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove, Common Sorrel (*Rumex acetosa*) and Creeping Bent (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape

(*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry and Great Wood-rush are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of clover species, including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*) These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*. Dry heath at the site generally grades into wet woodland or wet swamp vegetation lower down the slopes on the river bank. Close to the Blackstairs Mountains, in the foothills associated with the Aughnabrisky, Aughavaud and Mountain Rivers there are small patches of wet heath dominated by Purple Moor-grass (*Molinia caerulea*) with Heather, Tormentil (*Potentilla erecta*), Carnation Sedge (*Carex panicea*) and Bell Heather (*Erica cinerea*).

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

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

The estuary and the other E.U. Habitats Directive Annex I habitats within it form a large component of the site. Extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. Good quality intertidal sand and mudflats have developed on a linear shelf on the western side of Waterford Harbour, extending for over 6 km from north to south between Passage East and Creadaun Head, and in places are over 1 km wide. The sediments are mostly firm sands, though grade into muddy sands towards the upper shore. They have a typical macro-invertebrate fauna, characterised by polychaetes and bivalves. Common species include *Arenicola marina*, *Nephtys hombergii*, *Scoloplos armiger*, *Lanice conchilega* and *Cerastoderma edule*. An extensive area of honey-comb worm

biogenic reef occurs adjacent to Duncannon, Co. Wexford on the eastern shore of the estuary. It is formed by the polychaete worm *Sabellaria alveolata*. This intertidal *Sabellaria alveolata* reef is formed as a sheet of interlocking tubes over a considerable area of exposed bedrock. This polychaete species constructs tubes, composed of aggregated sand grains, in tightly packed masses with a distinctive honeycomb-like appearance. These can be up to 25cm proud of the substrate and form hummocks, sheets or more massive formations. A range of species are reported from these reefs including: *Enteromorpha* sp.; *Ulva* sp.; *Fucus vesiculosus*; *Fucus serratus*; *Polysiphonia* sp.; *Chondrus crispus*; *Palmaria palmate*; *Coralinus officinalis*; *Nemertea* sp.; *Actinia equine*; *Patella vulgate*; *Littorina littorea*; *Littorina obtusata* and *Mytilus edulis*.

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

The dunes which fringe the strand at Duncannon are dominated by Marram (*Ammophila arenaria*) towards the sea. Other species present include Wild Clary/Sage (*Salvia verbenaca*), a rare Red Data Book species. The rocks around Duncannon ford have a rich flora of seaweeds typical of a moderately exposed shore and the cliffs themselves support a number of coastal species on ledges, including Thrift, Rock Samphire (*Crithmum maritimum*) and Buck's-horn Plantain (*Plantago coronopus*). Other habitats which occur throughout the site include wet grassland, marsh, reedswamp, improved grassland, arable land, quarries, coniferous plantations, deciduous woodland, scrub and ponds.

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge, Clustered Clover, Basil Thyme (*Acinos arvensis*), Red Hemp-nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh-grass, Meadow Barley, Opposite-leaved Pondweed (*Groenlandia densa*), Meadow Saffron/Autumn Crocus (*Colchicum autumnale*), Wild Clary/Sage, Nettle-leaved Bellflower, Saw-wort (*Serratula tinctoria*), Bird Cherry, (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Ivy Broomrape (*Orobanche hederarum*) and Greater Broomrape. Of these, the first nine are protected under the Flora (Protection) Order, 2015. Divided Sedge was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge, Field Garlic (*Allium oleraceum*) and Summer Snowflake. Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including Freshwater Pearl Mussel (both *Margaritifera*

margaritifera and *M. m. durrovensis*), White-clawed Crayfish, Salmon, Twaite Shad, three lamprey species – Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail *Vertigo moulinsiana* and Otter. This is the only site in the world for the hard water form of the Freshwater Pearl Mussel, *M. m. durrovensis*, and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning.

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

Three rare invertebrates have been recorded in alluvial woodland at Murphy's of the River. These are: *Neoascia obliqua* (Order Diptera: Syrphidae), *Tetanocera freyi* (Order Diptera: Sciomyzidae) and *Dictya umbrarum* (Order Diptera: Sciomyzidae). The rare invertebrate, *Mitostoma chrysomelas* (Order Arachnida), occurs in the old oak woodland at Abbeyleix and only two other sites in the country. Two flies (Order Diptera) *Chrysogaster virescens* and *Hybomitra muhlfeldi* also occur at this woodland.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species, including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois, and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country. The old oak woodland at Abbeyleix has a typical bird fauna including Jay, Long-eared Owl and Raven. The reedbed at Woodstown supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

Land use at the site consists mainly of agricultural activities – mostly intensive in nature and principally grazing and silage production. Slurry is spread over much of the area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of E.U.

Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath, are also popular.

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

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

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