

# Appendix 7

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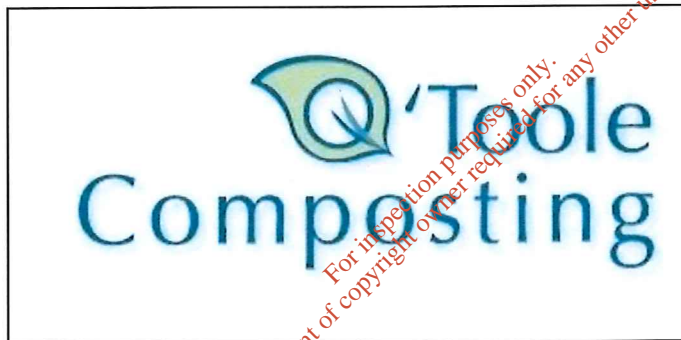
## Screening for AA

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July 2014

# **Screening Statement for the Proposed Operations**



**Ballintrane,  
Fenagh,  
Co. Carlow.**

ASH ECOLOGY

# O'Toole Composting Ltd.

Ballintrane, Fenagh, Co. Carlow.

## Screening Statement for the Proposed Operations

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## 1. Introduction

O'Toole Composting Ltd are applying for planning permission for the following developments at Ballinrane, Co. Carlow: (a) installation of 2 no. bio-filters; (b) development of truck intake air lock building; (c) development of a bring centre for domestic waste; (d) intensification of use of facility resulting in acceptance and processing of 40,000 tonnes of material for composting and 20,000 tonnes of general waste per annum; and (e) all associated site works.

The site is located in Ballinrane, Fenagh, Co. Carlow (see Figure 1).

Ash-Ecology has been commissioned to document the screening process to identify and determine the potential effects, if any, of the proposed operations at the composting facility on the conservation status of nearby sites with European Conservation designations i.e. Natura 2000 sites.

### 1.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "The Habitats Directive" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats

Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (2009/147/EEC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for AA as follows:

*"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication 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."*



The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures.

1. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts.
2. Second, mitigation measures should be applied, if necessary, during the AA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected.
3. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

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## 2. Methodology

This Screening Statement has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites'. The Guidance for Planning Authorities entitled 'Appropriate Assessment of Plans and Projects in Ireland' issued by the Department of Environment, Heritage and Local Government (DEHLG) in December 2009 and revised in February 2010 is also adhered to.

In complying with the obligations under Article 6(3) and following the above Guidelines, the approach to the screening process undertaken for this proposal is set out below:

1. Description of the proposed works;
2. Identification of Natura 2000 sites potentially affected and compilation of information on their qualifying interests and conservation objectives;
3. Identification and description of potentially significant impacts likely to result from the proposed works;
4. Assessment of the significance of the impacts identified above on the integrity of sites. Exclusion of sites where it can be objectively concluded that there will be no significant effects.

### 2.1 Desk Based Studies

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)<sup>1</sup> and the National Biodiversity Data Centre (NBDC)<sup>2</sup> was reviewed.

The relevant chapters of the Environmental Impact Statement (EIS)<sup>3</sup>, prepared by Enviroguide Consulting, addressing the potential environmental impacts of a proposed expansion to operations and the proposed mitigation measures, was reviewed.

<sup>1</sup> The National Parks and Wildlife Services map viewer <http://webgis.npws.ie/npwsviewer/>

<sup>2</sup> The National Biodiversity Data Centre [www.NBDC.ie](http://www.NBDC.ie)

<sup>3</sup> Enviroguide (2012) Environmental Impact Statement for O'Toole Composting Ltd.

### 3. Project Description

OTCL currently operates an enclosed windrow composting facility at and also a transfer facility for dry recyclables, general skip waste, household waste and construction and demolition waste.

The facility accepts various types of biodegradable waste for composting at the purpose built in vessel composting plant. Best available technology has been installed at the facility which has been operational since 2005. Various other waste streams are accepted at the facility for waste transfer. The waste transfer building accepts material for storage prior to removal offsite to approved pre-treatment, recycling, recovery or disposal facilities. Materials accepted include municipal solid waste, dry mixed recyclables, bulky waste and timber.

In 2008, OTCL upgraded the existing plant for its composting and installed the best available upgraded technology which it imported from Europe where techniques and practises are considerably advanced. OTCL view the current proposal as the next progressive step in improving and developing operations on site.

The proposed development is outlined below

There will be an increased intake of waste for composting with a proposed maximum annual intake of 40,000 tonnes. This will see the composting infrastructure that is currently in place at the facility being used to its maximum capacity. The current activity in the composting shed is the acceptance of Household Solid Municipal Waste, the screening of same to produce organic fines and the bio-stabilisation (composting) of these fines. The remaining material is then shredded and sent offsite for production into Solid Recovered Fuel (SRF). It is also proposed to construct a civic amenity facility which can be used by members of the public for their waste and recycling. It is also proposed to increase the tonnage of waste accepted in the current waste transfer building up to a maximum tonnage of 20,000 tonnes per annum. Waste material will be bulked up in this building prior to it being transferred offsite to a waste processing or landfill facility. In order to accommodate the additional waste proposed for this building it is proposed to expand the existing building. Planning permission has been granted for the expansion of this building.



## 4. Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites within a 15km radius of the OTCL facility is shown below in Table 1. There are no SPAs within 15km, or indeed within Co. Carlow.

**Table 1 Special Areas of Conservation within 5km & 15km of the OTCL Facility**

Site Name	Code	Within 5km	Approx Distance	Direction
Slaney River Valley	000781	-	6.4 km	East
River Barrow & River Nore	002162	-	8.5 km	West
Blackstairs Mountains	000770	-	11.5 km	South

The OTCL facility itself is not located within a designated site (refer to Figure 2) and all designated sites occur further than 5km of the site. There is no impact, or potential for impact, from the proposed operations, on the Slaney River Valley SAC and the Blackstairs Mountain SAC. Accordingly these two SACs will not be discussed regarding potential impacts.

While there are no qualifying interests of the River Barrow and River Nore SAC on, or adjacent to the facility, the surface water run-off from the site drains to the onsite surface water drainage network which in turn discharges into the Burren River. The Burren River is a tributary of the River Barrow.

In this regard the potential impacts to the water quality, affecting the River Burren, and potentially the River Barrow and River Nore SAC, will be addressed in detail in Section 5.

### 4.1 Characteristics of the Designated Sites

#### 4.1.1 River Barrow and River Nore (site code: 002162)

This is an extensive site covering 1,2373.17 ha and consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The SAC is noted for several riparian wetland habitats as well as a wide range of Annex II species. The site is selected for the qualifying habitats and species as set out in Tables 2 and 3 overleaf. The site synopsis is contained within Appendix A.



**Table 2 Qualifying Habitats for the River Barrow & Nore SAC**

<b>Qualifying Habitats (* denotes Priority Habitat)</b>	<b>Code</b>
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles	91A0
*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	91E0
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	3260
Salicornia and other annuals colonizing mud and sand	1310
Atlantic salt meadows ( <i>Glaucopuccinellietalia maritimae</i> )	1330
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	1410
European dry heaths	4030
*Petrifying springs with tufa formation (Cratoneurion)	7220
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430
Spartina swards ( <i>Spartinion maritimae</i> )	1320
Mudflats and sandflats not covered by seawater at low tide	1140
Estuaries	1130

**Table 3 Qualifying Annex II of Directive 92/43/EEC (the Habitats Directive)**

<b>Species</b>	<b>Species Name</b>
Mammals listed on Annex II of the Habitats Directive	<i>Lutra lutra</i> (Otter)
Fish species listed on Annex II of the Habitats Directive	<i>Salmo salar</i> (Atlantic salmon)
	<i>Petromyzon marinus</i> (Sea lamprey)
	<i>Lamprolaima planeri</i> (Brook lamprey)
	<i>Lamprolaima fluviatilis</i> (River lamprey)
	<i>Alosa fallax</i> (Twait shad)
Invertebrates listed on Annex II of the Habitats Directive	<i>Alosa alosa</i> (Allis shad)
	<i>Austropotamobius pallipes</i> (White clawed crayfish)
	<i>Margaritifera margaritifera</i> (Freshwater pearl mussel)
	<i>Margaritifera durrovensis</i> (Nore freshwater pearl mussel)
	<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail)

Conservation objectives were set for SAC 002162 in July 2011<sup>4</sup>. The overall aim of the Habitats Directive is to maintain favourable conservation status of the Annex I habitats and the Annex II species for which SAC 002162 has been selected. The Department of Arts, Heritage and the Gaeltacht (DAHG) has now set out specific targets, based on best available information, for the listed habitats and species in the Conservation Objectives.

<sup>4</sup> NPWS (2011) Conservation Objectives: River Barrow and River Nore SAC 002162. Version 1.0. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht.

## 5. Description and Assessment of Likely Impacts

### 5.1 Potential Impacts to Qualifying Interests of the River Barrow & River Nore SAC

#### 5.1.1 Habitat Loss and Disturbance

The flora and fauna surveys carried out for the previous EIS<sup>3</sup> found that there were no qualifying interests of the River Barrow and River Nore SAC on, or adjacent to the OTCL facility. The main habitat occurring on the site prior to the OTCL facility was improved agricultural grassland (GA1)<sup>5</sup>, and since then the site has been developed, resulting in the main habitat present to be hardstanding/buildings and artificial surfaces (BL3).<sup>5</sup>

#### 5.1.2 Discharge to Water

##### Construction Phase

The construction and operation of the proposed operations at the OTCL facility and ancillary hardstanding will alter the natural hydrological setting of the site, whereby overland surface run-off will be increased and natural runoff flow paths disrupted. Discharge of such runoff to receiving watercourses, i.e. the River Burren and subsequently the River Barrow, has the potential to have a negative impact on water quality. However the following measures are currently in place to prevent any pollution to surface water run-off during construction.

During the construction period, any sediment-laden water generated, due to exposure to soil surfaces, will either be attenuated within the site boundaries earthen berm or within the existing surface water drainage system, whereby surface water run-off can pass through a grit trap/oil interceptor prior to discharge. Appropriate measures are already in place that ensures any excess run-off is diverted through the existing site settlement tanks and grit traps. During the attenuation period, suspended materials are allowed to fall out of suspension prior to discharge to the surface water network.

##### Operational Phase

Measures set out below will ensure that discharges from the site, which could negatively impact surface water run-off and groundwater, are managed and regulated during the operational phase of the proposed operations of the facility. The measures are already in place for current operations:

- The waste to be handled will not come into contact with rainfall.
- The floor will be cleaned regularly.
- Current facility design will ensure any run-off from incoming material will be captured within the building.
- No waste water is discharged at or from the facility.

<sup>5</sup> Habitat codes taken from: Fossitt, J. (2000) A guide to Habitats in Ireland, Heritage Council, Kilkenny.

- Any run-off thus captured will be regarded as wastewater and will be diverted to the leachate tank which will be reused this water in the composting process.
- The correct design, construction and maintenance of wastewater collection and disposal systems will be used to prevent discharge to ground potentially leading to groundwater contamination.
- If the waste water run-off cannot be re-used as part of the composting process then it will be tankered off site to Carlow County Council's Waste-Water Treatment Facility.
- The correct design of bunded areas for the storage of Diesel tanks will be used to prevent groundwater contamination as a result of accidental spillages from the OTCL facility.
- The existing surface water and wastewater disposal systems on site are built in accordance with best practice and will prevent the occurrence of contaminated leakage or runoff from the site.
- All foul water from the offices and canteen are treated in the existing septic tank system.
- On site storage facilities and activities, any raw materials, fuels and chemicals, are stored within structurally sound warehousing buildings and/or bunded areas, if appropriate, to guard against potential accidental spills or leakages.
- All equipment and machinery has regular checking for leakages and quality of performance.

With the incorporation of these remedial measures, the potential impacts during the construction and operational phase, on the surface water quality of the River Burren, and subsequently the River Barrow and River Nore SAC, is screened out, as are potential contamination impacts to groundwater.

## 5.2 In-combination Effects

The Habitats Directive requires that due consideration needs to be given to any plan or project which is likely to have a significant effect alone or in combination with other plans and projects. As all potential negative impacts to Natura 2000 sites have been screened out, there cannot be in-combination effects with other plans or projects.



## 6. Screening Statement Conclusions

In terms of significance with regard to impacts on Natura 2000 sites, the NPWS Guidance (2009) uses an EC definition as follows:

*"any element of a plan or project that has the potential to affect the conservation objectives of a Natura 2000 site, including its structure and function, should be considered significant (EC, 2006)"*.

Overall, it can be concluded from the screening assessment completed above, that the proposed development will not result in likely significant direct or indirect impacts, either alone or in combination, on the structure, function and conservation objectives for the River Barrow and River Nore SAC or any other Natura 2000 site.

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# FIGURES

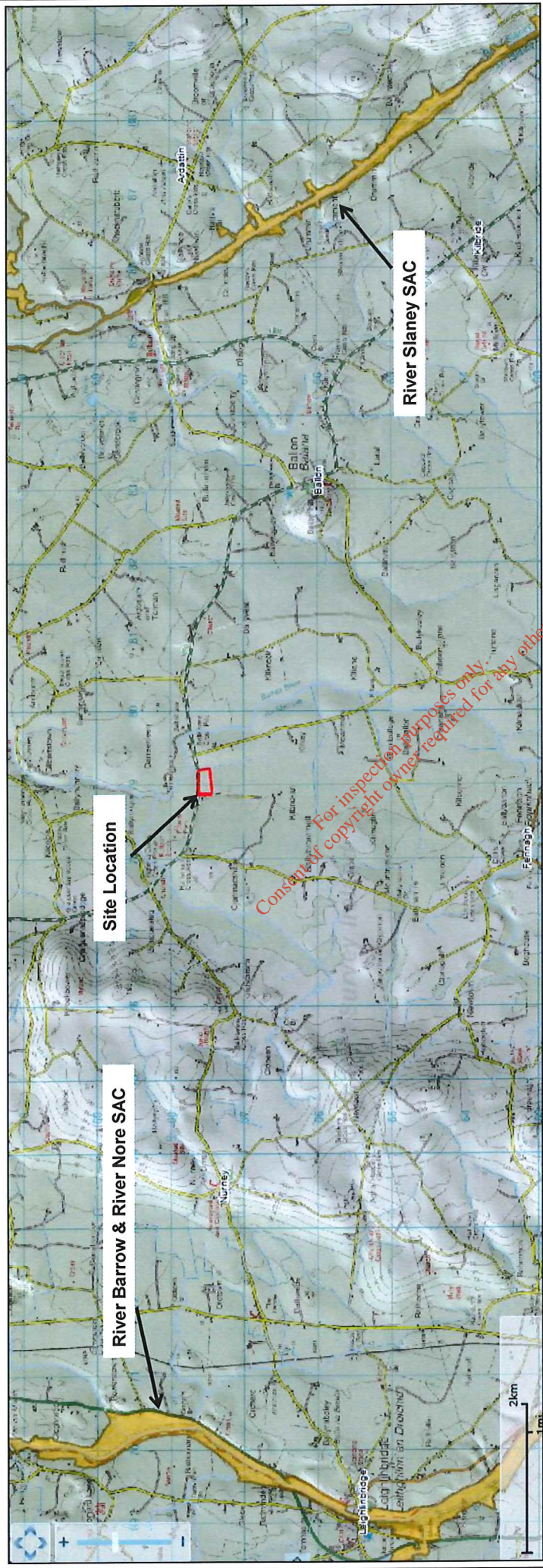


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Client O'Toole Composting Ltd		Drawing Site Location	
Job Screening Statement of Proposed Expansion		Status Final	
Drawing Number Figure 1	Scale A4	Date Jul 14	Drawn AW





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Client O'Toole Composting Ltd		Drawing Site Location & Designated Areas within 10km			
Job Screening Statement of Proposed Expansion		Sht. Size A4	Scale As shown	Date Aug 13	Drawn AW
Drawing Number Figure 2		Status Final			

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# APPENDIX A



## SITE SYNOPSIS

**SITE NAME: RIVER BARROW AND RIVER NORE**

**SITE CODE: 002162**

This site consists of the freshwater stretches of the Barrow/Nore River catchments as far upstream as the Slieve Bloom Mountains and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlington, 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 runs through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

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

Good examples of Alluvial Forest are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (*Salix triandra*), White Willow (*S. alba*), Grey Willow (*S. cinerea*), Crack Willow (*S. fragilis*), Osier (*S. viminalis*), with Iris (*Iris pseudacorus*), Hemlock Water-dropwort (*Oenanthe crocata*), Angelica (*Angelica sylvestris*), Thin-spiked Wood-sedge (*Carex strigosa*), Pendulous Sedge (*C. pendula*), Meadowsweet (*Filipendula ulmaria*), Valerian (*Valeriana officinalis*) and the Red Data Book species Nettle-leaved Bellflower (*Campanula trachelium*). Three rare invertebrates have been recorded in this habitat at Murphy's of the River. These are: *Neoascia obliqua* (Diptera: Syrphidae), *Tetanocera freyi* (Diptera: Sciomyzidae) and *Dictya umbrarum* (Diptera: Sciomyzidae).

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

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

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

On the steeply sloping banks of the River Nore about 5 km west of New Ross, in County Kilkenny, Kylecorragh Woods form a prominent feature in the landscape. This is an excellent example of a relatively undisturbed, relict Oak woodland with a very good tree canopy. The wood is quite damp and there is a rich and varied ground flora. At Brownstown a small, mature Oak-dominant woodland occurs on a steep slope. There is younger woodland to the north and east of it. Regeneration throughout is evident. The understorey is similar to the woods at Brownsford. The ground flora of this woodland is developed on acidic, brown earth type soil and comprises a thick carpet of Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*), Hard Fern (*Blechnum spicant*), Cow-wheat (*Melampyrum* spp.) and Bracken (*Pteridium aquilinum*).

Borris Demesne contains a very good example of a semi-natural broad-leaved woodland in very good condition. There is quite a high degree of natural 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 (*Ilex aquifolium*), and the herb



layer is varied, with Brambles abundant. Whitebeam (*Sorbus devoniensis*) has also been recorded.

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

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

Dry Heath at the site occurs in pockets along the steep valley sides of the rivers especially in the Barrow Valley and along the Barrow tributaries where they occur in the foothills of the Blackstairs Mountains. The dry heath vegetation along the slopes of the river bank consists of Bracken (*Pteridium aquilinum*) and Gorse (*Ulex europaeus*) species with patches of acidic grassland vegetation. Additional typical species include Heath Bedstraw (*Galium saxatile*), Foxglove (*Digitalis purpurea*), Common Sorrel (*Rumex acetosa*) and Bent Grass (*Agrostis stolonifera*). On the steep slopes above New Ross the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*) has been recorded. Where rocky outcrops are shown on the maps Bilberry (*Vaccinium myrtillus*) and Wood Rush (*Luzula sylvatica*) are present. At Ballyhack a small area of dry heath is interspersed with patches of lowland dry grassland. These support a number of Clover species including the legally protected Clustered Clover (*Trifolium glomeratum*) - a species known from only one other site in Ireland. This grassland community is especially well developed on the west side of the mud-capped walls by the road. On the east of the cliffs a group of rock-dwelling species occur, i.e. English Stonecrop (*Sedum anglicum*), Sheep's-bit (*Jasione montana*) and Wild Madder (*Rubia peregrina*). These rocks also support good lichen and moss assemblages with *Ramalina subfarinacea* and *Hedwigia ciliata*.

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

Saltmeadows occur at the southern section of the site in old meadows where the embankment has been breached, along the tidal stretches of in-flowing rivers below Stokestown House, in a narrow band on the channel side of Common Reed (*Phragmites*) beds and in narrow fragmented strips along the open shoreline. In the larger areas of salt meadow, notably at Carrickcloney, Ballinlaw Ferry and Rochestown on the west bank; Fisherstown, Alderton and Great Island to Dunbrody on the east bank, the Atlantic and

Mediterranean sub types are generally intermixed. At the upper edge of the salt meadow in the narrow ecotonal areas bordering the grasslands where there is significant percolation of salt water, the legally protected species Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) (Flora Protection Order, 1987) are found. The very rare Divided Sedge (*Carex divisa*) is also found. Sea Rush (*Juncus maritimus*) is also present. Other plants recorded and associated with salt meadows include Sea Aster (*Aster tripolium*), Sea Thrift (*Armeria maritima*), Sea Couch (*Elymus pycnanthus*), Spear-leaved Orache (*Atriplex prostrata*), Lesser Sea-spurrey (*Spergularia marina*), Sea Arrowgrass (*Triglochin maritima*) and Sea Plantain (*Plantago maritima*).

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

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

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

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

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

Seventeen Red Data Book plant species have been recorded within the site, most in the recent past. These are Killarney Fern (*Trichomanes speciosum*), Divided Sedge (*Carex divisa*), Clustered Clover (*Trifolium glomeratum*), Basil Thyme (*Acinos arvensis*), Hemp nettle (*Galeopsis angustifolia*), Borrer's Saltmarsh Grass (*Puccinellia fasciculata*),



Meadow Barley (*Hordeum secalinum*), Opposite-leaved Pondweed (*Groenlandia densa*), Autumn Crocus (*Colchicum autumnale*), Wild Sage (*Salvia verbenaca*), Nettle-leaved Bellflower (*Campanula trachelium*), Saw-wort (*Serratula tinctoria*), Bird Cherry (*Prunus padus*), Blue Fleabane (*Erigeron acer*), Fly Orchid (*Ophrys insectifera*), Broomrape (*Orobanche hederæ*) and Greater Broomrape (*Orobanche rapum-genistæ*). Of these the first nine are protected under the Flora Protection Order 1999. Divided Sedge (*Carex divisa*) was thought to be extinct but has been found in a few locations in the site since 1990. In addition plants which do not have a very wide distribution in the country are found in the site including Thin-spiked Wood-sedge (*Carex strigosa*), Field Garlic (*Allium oleraceum*) and Summer Snowflake (*Leucojum aestivum*). Six rare lichens, indicators of ancient woodland, are found including *Lobaria laetevirens* and *L. pulmonaria*. The rare moss *Leucodon sciuroides* also occurs.

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

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

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

Landuse at the site consists mainly of agricultural activities – many intensive, principally grazing and silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of the salmonid river and to the populations of Habitats Directive Annex II animal species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles

have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

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

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

6.10.2006