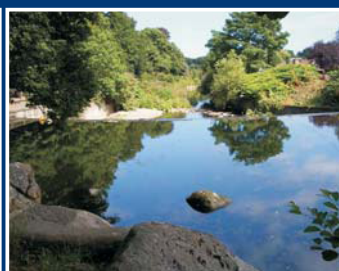
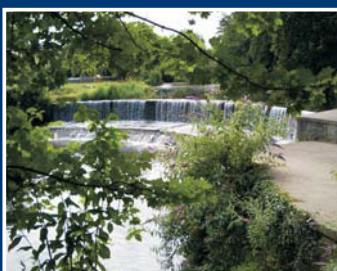
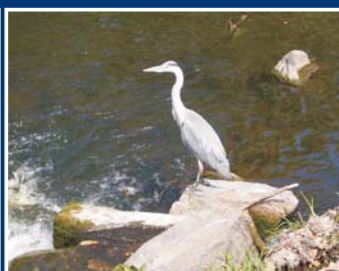
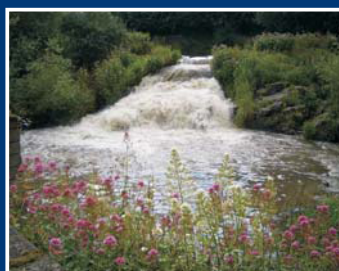


RIVER DODDER CATCHMENT FLOOD RISK MANAGEMENT PLAN



Habitats Directive Article 6 Assessment for the Dodder Catchment Flood Risk Management Plan

Appropriate Assessment Report



Natura 2000 Appropriate Assessment for the River Dodder Flood Risk Assessment and Management Study

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LIST OF ABBREVIATIONS

AA	Appropriate Assessment
APSR	Areas of Potential Significant Risk
AU	Analysis Unit
CFRAMS	Catchment Flood Risk Assessment and Management Study
CFRMP	Catchment Flood Risk Assessment and Management Plan
DCC	Dublin City Council
DCENR	Department of Communications, Energy and Natural Resources
DCMNR	Department of Communications, Marine and Natural Resources
DEHLG	Department of Environment, Heritage and Local Government
DLRCC	Dun Laoghaire Rathdown County Council
EPA	Environmental Protection Agency
ERBD	Eastern River Basin District
ERFB	Eastern Regional Fisheries Board
HDA	Habitats Directive Assessment
IFI	Inland Fisheries Ireland
IRR	Individual Risk Receptor
NHA	National Heritage Area
NPWS	National Parks and Wildlife Service
OPW	Office of Public Works

RBD	River Basin District
SAC	Special Area of Conservation
SDCC	South Dublin County Council
SEA	Strategic Environmental Assessment
SI	Statutory Instrument
SPA	Special Protection Area

GLOSSARY OF TERMS

Appropriate Assessment An assessment of the effects of a plan or project on the Natura 2000 network. The Natura 2000 network comprises Special Protection Areas under the Birds Directive, Special Areas of Conservation under the Habitats Directive and Ramsar sites designated under the Ramsar Convention.

Areas of Potential Significant Risk (APSRs) Existing urban areas with quantifiable flood risk.

Assessment Unit Defines the spatial scale at which flood risk management options are assessed. Assessment Units are defined on four spatial scales ranging in size from largest to smallest as follows: catchment scale, Assessment Unit (AU) scale, Areas of Potential Significant Risk (APSR) and Individual Risk Receptors (IRR).

Biodiversity Word commonly used for biological diversity and defined as assemblage of living organisms from all habitats including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part.

Birds Directive Council Directive of 2nd April 1979 on the conservation of wild birds (79/409/EEC).

Catchment A surface water catchment is the total area of land that drains into a watercourse.

Catchment Flood Risk Management Plan (CFRMP) A large-scale strategic planning framework for the integrated management of flood risks to people and the developed and natural environment in a sustainable manner.

Estuary A semi-enclosed coastal body of water with one or more rivers or streams flowing into it, and with an open connection to the sea.

Flood An unusual accumulation of water above the ground caused by high tide, heavy rain, melting snow or rapid runoff from paved areas. In this study a flood is marked on the maps where the model shows a difference between ground level and the modelled

water level. There is no depth criterion, so even if the water depth is shown as 1mm, it is designated as flooding.

Flood defence A structure (or system of structures) for the alleviation of flooding from rivers or the sea.

Flood risk Refers to the potential adverse consequences resulting from a flood hazard. The level of flood risk is the product of the frequency or likelihood of flood events and their consequences (such as loss, damage, harm, distress and disruption).

Flood Risk Management Measure Structural and non-structural interventions that modify flooding and flood risk either through changing the frequency of flooding, or by changing the extent and consequences of flooding, or by reducing the vulnerability of those exposed to flood risks.

Flood Risk Management Option Can be either a single flood risk management measure in isolation or a combination of more than one measure to manage flood risk.

Floodplain Any area of land over which water flows or is stored during a flood event or would flow but for the presence of flood defences.

Geographical Information System (GIS) A GIS is a computer-based system for capturing, storing, checking, integrating, manipulating, analysing and displaying data that are spatially referenced.

Geomorphology The science concerned with understanding the form of the Earth's land surface and the processes by which it is shaped, both at the present day as well as in the past.

Groundwater All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil. This zone is commonly referred to as an aquifer which is a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow a significant flow of groundwater or the abstraction of significant quantities of groundwater.

Habitats Directive European Community Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Flora and Fauna and the transposing Irish regulations (The European Union (Natural Habitats) Regulations, SI 94/1997 as amended).. It establishes a system to protect certain fauna, flora and habitats deemed to be of European conservation importance.

Heavily modified water body Surface waters that have been substantially changed for such uses as navigation (ports), water storage (reservoirs), flood defence (flood walls) or land drainage (dredging).

Individual Risk Receptors (IRR) Essential infrastructure assets such as a motorway or potentially significant environmentally polluting sites.

Mitigation measures Measures to avoid/prevent, minimise/reduce, or as fully as possible, offset/compensate for any significant adverse effects on the environment, as a result of implementing a plan or project.

Natura 2000 European network of protected sites which represent areas of the highest value for natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community. The Natura 2000 network will include two types of area. Areas may be designated as Special Areas of Conservation (SAC) where they support rare, endangered or vulnerable natural habitats and species of plants or animals (other than birds). Where areas support significant numbers of wild birds and their habitats, they may become Special Protection Areas (SPA). SACs are designated under the Habitats Directive and SPAs are classified under the Birds Directive. Some very important areas may become both SAC and SPA.

Natural Heritage Area An area of national nature conservation importance, designated under the Wildlife Act 1976 (as amended), for the protection of features of high biological or earth heritage value or for its diversity of natural attributes.

Non structural options Include flood forecasting and development control to reduce the vulnerability of those currently exposed to flood risks and limit the potential for future flood risks.

Ramsar site Wetland site of international importance designated under the Ramsar Convention on Wetlands of International Importance 1971, primarily because of its importance for waterfowl.

River Basin Districts Administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD.

Scoping the process of deciding the content and level of detail of an aaA, including the key environmental issues, likely significant environmental effects and alternatives which need to be considered, the assessment methods to be employed, and the structure and contents of the Natura Impact Statement.

Screening The determination of whether implementation of a plan or project would be likely to have significant environmental effects on the Natura 2000 network.

SEA Directive Directive 2001/42/EC ‘on the assessment of the effects of certain plans and programmes on the environment’.

Sedimentation The deposition by settling of a suspended material.

Significant effects Effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

Special Area for Conservation (SAC), Candidate Special Area for Conservation (cSAC) A SAC are internationally important site, protected for its habitats and non-bird species. It is designated, as required, under the EC Habitats Directive. A cSAC is a candidate site, but is afforded the same status as if it were confirmed.

Special Protection Area (SPA) A SPA is a site of international importance for breeding, feeding and roosting habitat for bird species. It is designated, as required, under the EC Birds Directive.

Statutory Instrument Any order, regulation, rule, scheme or byelaw made in exercise of a power conferred by statute.

Structural options Involve the application of physical flood defence measures, such as flood walls and embankments, which modify flooding and flood risk either through changing the frequency of flooding, or by changing the extent and consequences of flooding.

Surface Water Means inland waters, except groundwater, which are on the land surface (such as reservoirs, lakes, rivers, transitional waters, coastal waters and, under some circumstances, territorial waters) which occur within a river basin.

Sustainability A concept that deals with mankind's impact, through development, on the environment. Sustainable development has been defined as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland, 1987). Sustainability in the flood risk management context could be defined as the degree to which flood risk management options avoid tying future generations into inflexible or expensive options for flood defence. This usually includes consideration of other defences and likely developments as well as processes within a catchment.

The Office of Public Works (OPW) The lead agency with responsibility for flood risk management in Ireland.

Tidal Related to the sea and its tide.

Transitional waters Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their vicinity to coastal waters, but which are substantially influenced by freshwater flows.

Water body A discrete and significant element of surface water such as a river, lake or reservoir, or a distinct volume of groundwater.

Water course Any flowing body of water including rivers, streams etc.

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1.0 Introduction

RPS was commissioned by Dublin City Council, on behalf of the Office of Public Works (OPW), to determine whether the proposed Dodder Catchment Flood Risk Management Plan (CFRMP) could have a significant effect on the integrity of Natura 2000 sites as a result of the implementation of certain flood control/management options (termed preferred options) identified in the CFRMP.

1.1 Background to Flood Risk Management

Flood risk in Ireland has historically been addressed largely through a reactive approach and with the use of structural or engineered solutions. In line with internationally changing perspectives, the Government adopted a new policy in 2004 that shifted the emphasis in flood risk towards:

- a catchment context for managing risk;
- more proactive risk assessment and management, with a view to avoiding or minimising future increases in risk; and
- increased use of non-structural and flood impact mitigation measures.

Notwithstanding this shift, engineered solutions to manage existing risks are likely to continue to form a key component of any flood risk management strategy. Catchment Flood Risk Assessment and Management Studies (CFRAMSs) and their product - Catchment Flood Risk Management Plans (CFRMPs) - are at the core of this new national policy for flood risk management and the strategy for its implementation. These studies have been developed to meet the requirements of the EU Directive on the assessment and management of flood risks (the Floods Directive).

1.2 The River Dodder and the Dodder Catchment Flood Risk Management Plan (CFRMP)

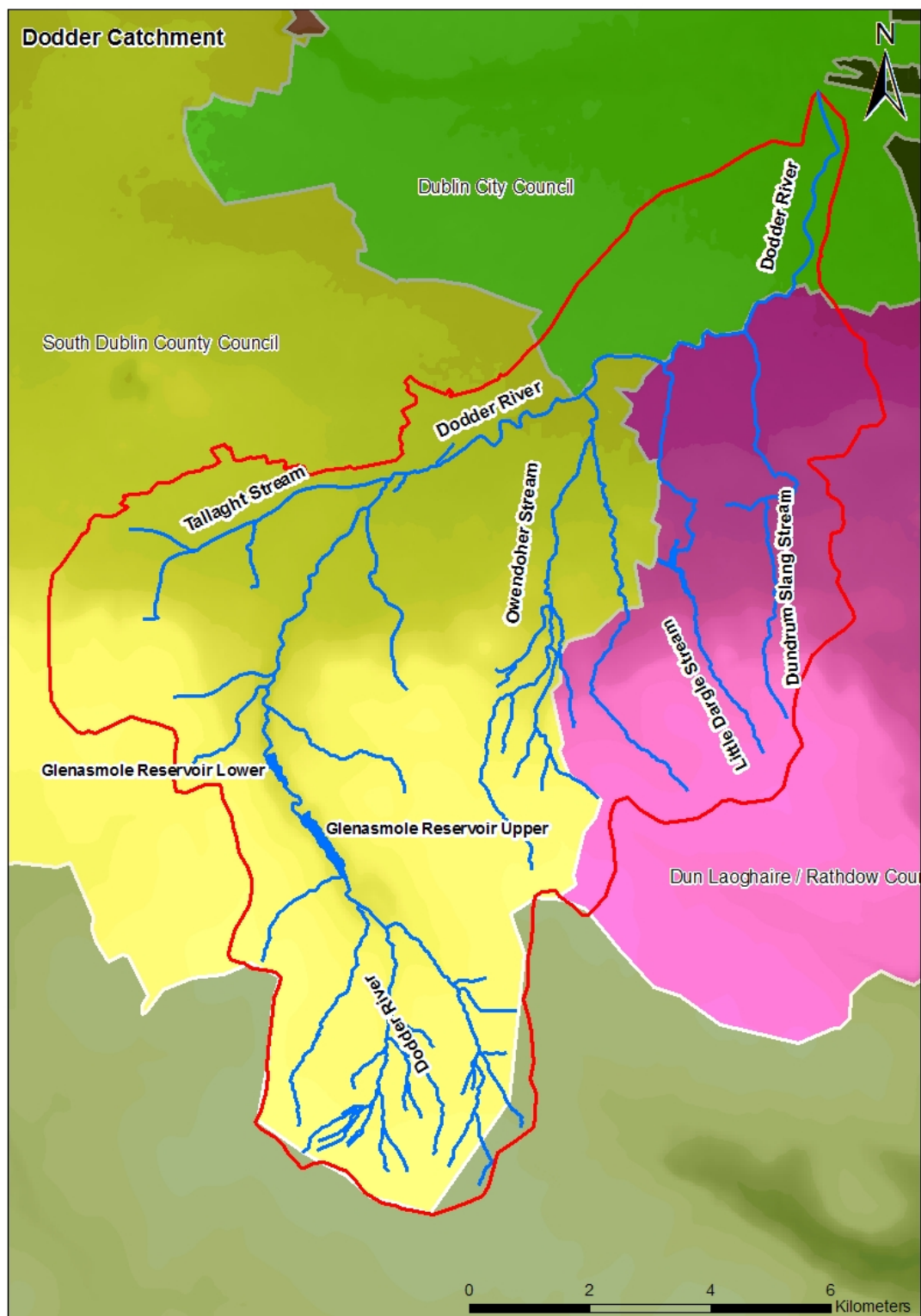
The Dodder Catchment encompasses parts of the administrative areas of South Dublin County Council, Dun Laoghaire-Rathdown County Council and Dublin City Council. The extent of the catchment boundary can be seen in **Figure 1.0**. The River Dodder has five main tributaries; the Dundrum Slang, the Little Dargle, the Owendoher, the Whitechurch and the Tallaght Stream. The catchment covers a total area of 12,080 ha

(120.8km²). The river rises in Kippure Mountain in the Dublin Mountains at a height of 763m. The upper reaches of the river comprise three local streams – Slade Brook, Cott Brook and the Dodder. These streams merge at Glenasmole Valley and discharge to the Lower Reservoir at Bohernabreena, by-passing the Upper Reservoir which is used for water supply to Dublin.

The Dodder discharges to the Liffey Estuary at Ringsend. The lower section of the river is tidal as far upstream as Ballsbridge. In the middle catchment, residential and commercial land uses compete with agricultural use. In the lower catchment the land use is almost entirely comprised of residential, public park and commercial land uses. The Dodder's surrounding parklands are an extremely important amenity to Dublin and the river is widely used by fishermen and a variety of sporting and recreational interest over its 27km length.

The River Dodder has overflowed its banks on numerous occasions, notably during the 1986 'Hurricane Charlie' event and again in 2000 and 2002. Consequently the development of a Catchment Flood Risk Management Plan (CFRMP) for the River Dodder catchment has been identified as a priority project due to existing flood risk. In response to this, and following approval from the Office of Public Works, Dublin City Council was appointed as Contracting Authority to complete a Flood Risk Assessment and Management Study (CFRAMS) for the River Dodder Catchment which incorporates the relevant areas of Dublin City Council, Dun Laoghaire-Rathdown County Council and South Dublin County Council

Fig. 1.1 River Dodder Catchment



1.3 Development of Dodder Catchment Flood Risk Management Plan

In line with Government policy, the Dodder Catchment Flood Risk Assessment and Management Study (CFRAMS) was initiated. While the Dodder CFRAM Study considers flood risk on a catchment-wide basis, it has focused on areas where the flood risk was understood to be, or might become, significant (Areas of Potentially Significant Risk/flood cells and individual risk receptors). These areas and properties were identified by the OPW with Dublin City Council, Dún Laoghaire-Rathdown County Council and South Dublin County Council.

The River Dodder CFRAMS informs the River Dodder CFRMP, and aims to assess the spatial extent and degree of flood hazard and risk within the Dodder Catchment, examine future pressures that could impact on flood risk, and develop a long-term strategy for managing flood risk that is environmentally, economically and socially sustainable. The CFRMP is to include a set of prioritised studies, actions and works (structural and non structural) to manage the flood risk in the area in the long-term, and make recommendations in relation to appropriate development planning. Although the CFRAMS is intended to develop a strategic flood risk management plan, it is not intended to develop detailed designs for individual flood risk management measures.

Therefore, during the Dodder CFRAM Study, to structure the process for option development, the Dodder catchment was divided into a number of assessment units, which are defined at four spatial scales:

- **Catchment scale:** in this case the Dodder catchment study area (~120 km²);
- **Sub catchment or analysis unit (AU) scale:** these are main sub-catchments individually or grouped in cases where flood extents interact (i.e. the Dodder (upper, middle and lower) or five main tributaries);
- **Areas of potential significant risk (APSR) or flood cell scale:** these are existing urban areas with high degrees of flood risk and in some cases localised areas (flood cells) that may have stand-alone flood risk management options;
- **Individual risk receptor (IRR):** an individual asset of particular economic or social value that has been identified as being prone to flooding and hence represents a significant risk in its own right, such as transport and utilities

infrastructure, which may require specific consideration during the development of the flood risk management options.

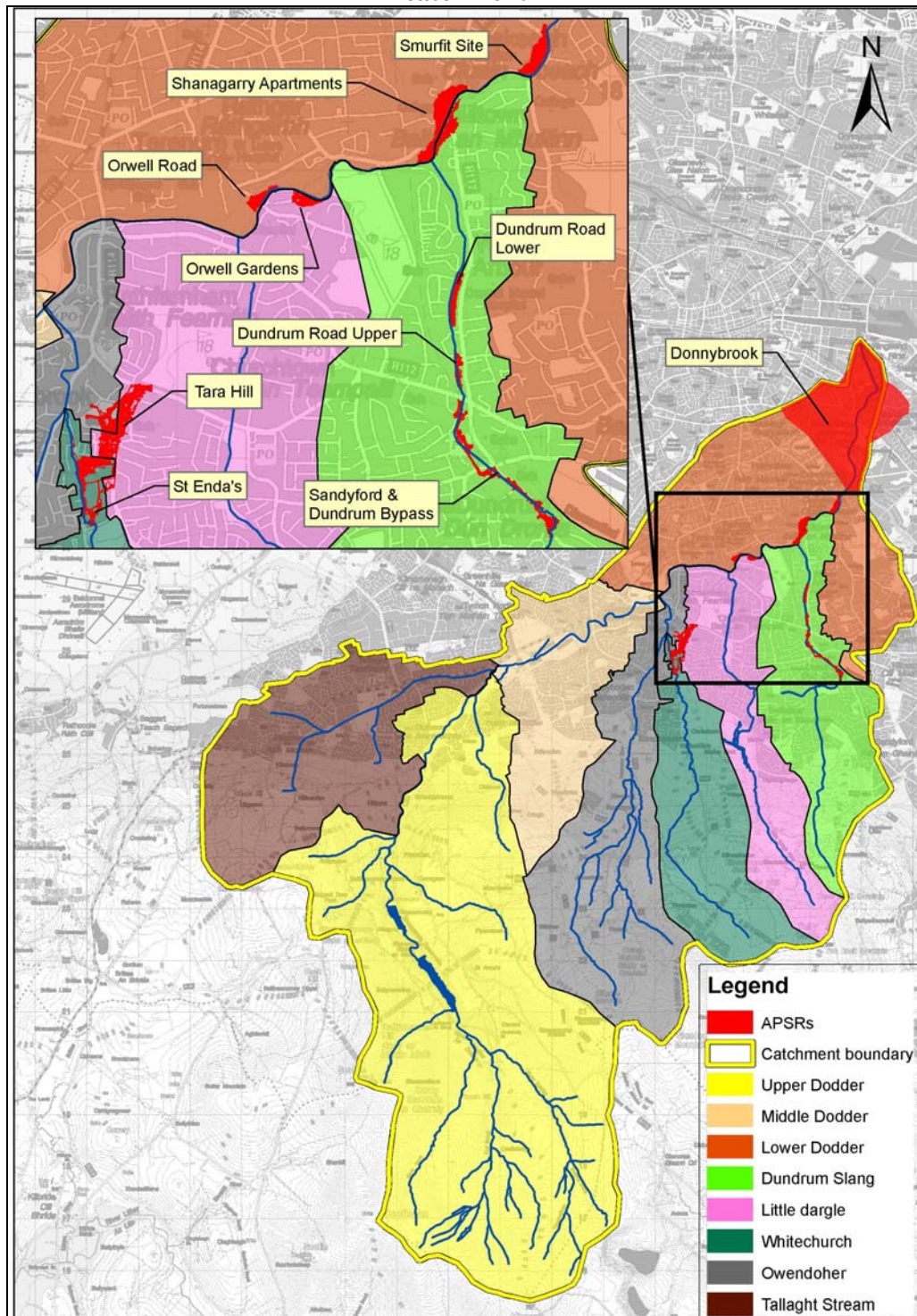
The assessment of flood risk was carried out for the entire Dodder catchment but to facilitate a more focused assessment the large Dodder catchment was divided into smaller assessment units (AUs) based on the areas of the sub-catchments or tributaries.

Table 1.1 Catchment, sub catchment/AUs, APSRs and flood cells for the Dodder catchment

Catchment	Sub catchment /Assessment Units	APSRs/Flood Cells
Dodder catchment	Dodder (upper, middle & lower)	Donnybrook to the railway bridge Orwell Gardens Orwell Road Shanagarry Apartments Smurfit Site
	Tallaght stream & tributary	
	Owendoher & Whitechurch streams	Tara Hill residential St Enda's residential
	Little Dargle	
	Dundrum Slang	Dundrum Road Upper Dundrum Road Lower Dundrum & Sandyford Bypass

Within each of these sub-catchments or Assessment Units, the risk assessment identified areas where the flood risk was understood to be, of might become, significant, and these areas are termed Areas of Potentially Significant Risk (APSR) or Flood Cells. The list of assessment units and flood cells considered for implementation of preferred measures are summarised in Table 1.1 and outlined in Fig 1.2.

Figure 1.2 Catchment, sub catchment/AUs, APSRs and flood cells for the Dodder catchment



The draft Dodder CFRMP proposes certain flood control/management options (preferred options) for each of the assessment units. These preferred options are outlined in the Table 1.2. The hard defenses may include: embankments, flood walls, parapets, dredging or weir removal.

Table 1.2: Preferred Options listed in River Dodder Draft FRAMP

Area of Assessment	Preferred Option
Catchment wide	Support measures - SuDS, asset surveys, maintenance, early coastal warning and public awareness along with monitoring and policy measures
Little Dargle AU	Hard defences
Lower Dodder - Donnybrook APSR	Hard defences
Orwell Gardens APSR	Hard defences
Shanagarry Apartments & Smurfit Site	Hard defences
St Endas & Tara Hill	Hard defences, dredging and removal of weirs

One of the preferred options includes a list of non-structural measures (termed support measures) and these are to be implemented across the Dodder catchment, an area of approximately 120 m². In addition, there are five preferred options involving structural measures and these are proposed for specific areas within the catchment.

1.4 Habitats Directive Assessment Requirements

The Habitats Directive provides legal protection for habitats and species of European importance. The main aim of the Habitats Directive is “*to contribute towards ensuring biodiversity through the conservation of natural habitats of wild fauna and flora in the European territory of the Member States to which the treaty applies*” (92/43/EEC). Actions taken in order to fulfil the Directive must be designed to “*maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*” (92/43/EEC).

The Directive provides for the creation of protected sites, SACs, for a number of habitat types and certain species of flora and fauna. The Directive also seeks to establish Natura 2000, a network of protected areas throughout Europe. SACs, together with SPAs designated under the Birds Directive (79/409/EEC), form the Natura 2000 network. The Directive was incorporated into Irish law by the European Communities (Natural Habitats) Regulations (S.I. No. 94 of 1997) under Regulation 31 (Annex 1.2) and is outlined in Circular Letters SEA 1/08, NPWS 1/08, NPW 1/10 and PSSP 2/10.

An assessment is required under the Habitats Directive for any plan or project likely to have a significant effect on a Natura 2000 site. Article 6, paragraphs 3 and 4 of the Habitats Directive state that:

6(3) 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.

6(4) 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 a social or economic 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.

This means that, where the implementation of the proposed development is likely to have a significant effect on a Natura 2000 site, the Local Authority must ensure that an appropriate assessment is carried out in view of that site's conservation objectives. The proposed development can only be approved if it has been ascertained that it will not adversely affect the integrity of the Natura 2000 sites concerned or, in the case of a negative assessment and where there are no alternative solutions, the scheme can only be approved for reasons of overriding public interest.

A key protection mechanism, is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. The obligation to undertake appropriate assessment derives from Article 6(3) and 6(4) of the Habitats Directive and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made. They also determine the decisions that ultimately may be made in relation to approval or refusal of a plan or project. AA involves a case-by-case examination of the implications for the Natura 2000 site and its conservation objectives.

In general terms, implicit in Article 6(3) is an obligation to put concern for potential effects on Natura 2000 sites at the forefront of every decision made in relation to plans and projects at all stages, including decisions to provide funding or other support. The first test is to establish whether, in relation to a particular plan or project, appropriate assessment is required. This is termed screening for AA. Its purpose is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives. The need to apply the precautionary principle in making any key decisions in relation to the tests of AA is also a requirement. Therefore, where significant effects are likely, possible or uncertain at screening stage, AA will be required.

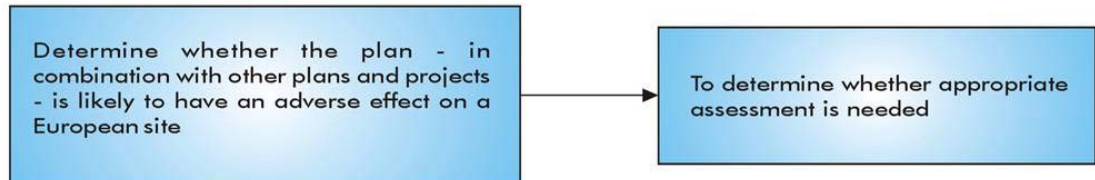
If it can be concluded on the basis of AA that there will be no adverse effects on the integrity of a Natura 2000 site, the plan or project can proceed to authorisation. If adverse effects are likely, or cannot be ruled out, the derogation steps of Article 6(4) will apply, but only in a case in which there are imperative reasons of overriding public interest (IROPI) requiring a project to proceed, there are no less damaging alternative solutions,

and compensatory measures have been identified that can be put in place. The IROPI test is more rigorous and restrictive in relation to adverse effects on Annex I priority habitats and species. The Habitats Directive requires Member States to inform the Commission of the compensatory measures; this enables the Commission to review whether the compensatory measures are sufficient to ensure that the coherence of the network is maintained. If the Commission is not satisfied it may take steps against the Member State up to and including litigation in the European Court of Justice. Recourse to derogation to allow a plan or project to proceed should be pursued in exceptional circumstances only, and the Minister must be informed at an early stage of any possible IROPI case.

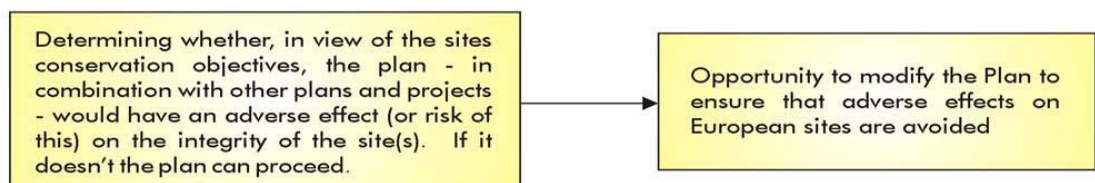
A flow diagram is presented in Fig. 1.3 illustrating the four stages of the Habitats Assessment process.

Figure 1.3: Key Stages in Undertaking an Assessment Under the Habitats Directive

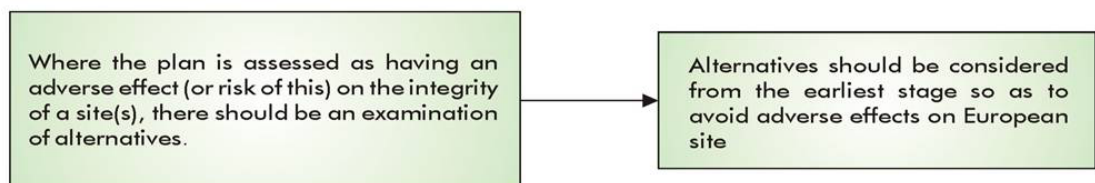
Stage 1: Screening



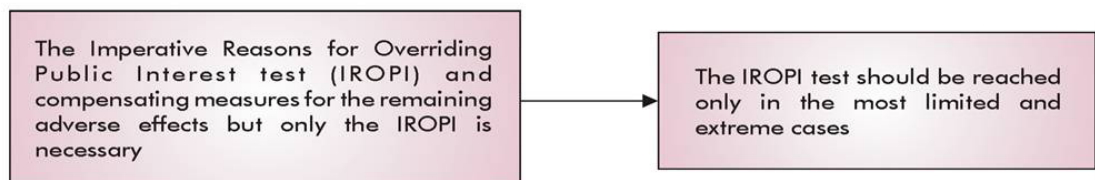
Stage 2: Appropriate Assessment



Stage 3: Assessment of Alternative Solutions



Stage 4: No Alternative Solutions & Adverse Impacts Remain



Sites designated under the Habitats Directive and Birds Directive form this network of European-protected sites, which is known as the Natura 2000 network. They consist of;

- Special Areas of Conservation (SACs) for flora, fauna and habitats of European Community interest under the EU Habitats Directive;
- Special Protection Areas (SPAs) for rare, vulnerable or migratory birds under the EU Birds Directive; and
- Sites that are being considered for designation as one of the above, referred to as cSACs (candidate) or pSPAs (proposed).

1.5 SEA (Strategic Environmental Assessment)

An SEA is the formal, systematic evaluation of the likely significant environmental impacts of a proposed plan or programme and is carried out prior to the adoption of the plan or programme. Habitat's Directive Article 6 assessment is a complementary process to SEA and is specifically designed to protect European sites. The table below illustrates the linkages between the SEA and Habitats Assessment. Liaison between the SEA team and the Habitats Assessment team was critical throughout the process to ensure that results from the Habitats Assessment are incorporated into the SEA and to facilitate changes to the CFRMP, thereby making it more robust.

Table 1.3 Links between the SEA Process and the Habitats Assessment Process

Stage	SEA	Habitats Directive Article 6 Assessment	HA stage definitions
1	Screening	Screening	The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.
2	Scoping	Appropriate Assessment	The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.
3	Alternatives	Assessment of preferred alternatives	The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 sites.
4	SEA Statement	Assessment where no alternatives exist	An assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

1.6 Appropriate Assessment Guidance

The appropriate assessment has been carried out using the following guidance:

- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on *Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities* March 2010.

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009;
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg (EC 2000).
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission.

1.7 Structure and Content of this AA/Natura Impact Statement

Following the identification of the need for an assessment of the proposed Dodder CFRMP under the requirements of the Habitats Directive, in line with the requirements of guidance and circular letters, detailed above, and with reference to recent practice in Ireland, it was established that the assessment would be undertaken in two phases – an initial screening phase and, if required, a subsequent, more detailed, appropriate assessment phase.

In compliance with Article 6(3) of the EU Habitats Directive, this appropriate assessment must then determine whether or not the plan will adversely affect the integrity (The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified) of the European site. As part of this process, the advice of NPWS needs to be sought and considered. Should the appropriate assessment identify that the proposed CFRMP would have an adverse effect on the integrity of a *Natura 2000* site, there is a requirement that further conditions must be satisfied before a Plan could be finalised.

1.8 Outline of Report

This report is the output from the initial screening phase and the appropriate assessment phase, as based on an examination of *Natura 2000* Site Synopses as well as readily accessible internet resources concerning the nature and wildlife value of the sites. The screening assessment determined whether the proposed Dodder CFRMP is likely to have significant effects on each of the *Natura 2000* sites qualifying features and established the need to proceed to Stage 2 of the Habitats Directive assessment (Appropriate Assessment). The appropriate assessment then involved a more detailed analysis of the potential situations for a significant effect, in order to determine whether the integrity of the *Natura 2000* sites would be adversely affected by the CFRMP. The assessment unit used for this AA was the overall Dodder catchment so as to capture all changes in hydrology and river flow as a result of the implementation of each preferred option and also as a result of implementation of the combination of preferred options.

2.0 Detailed Methodology to be used for the Habitats

Directive Assessment

2.1 Data collection

An extensive data collection exercise was carried out for the purposes of this assessment. The data collated is as follows:

A full list of all Natura 2000 Sites within a 15 km buffer of the River Dodder Catchment and details of their qualifying features, was collated (Table 3.1), along with their geographical locations and extents which were provided as Geographical Information System (GIS) layers (Arc GIS format). The conservation objectives associated with these SACs and SPAs are available to the assessment team. The conservation management plans available for Ireland were accessed on the NPWS website (<http://www.npws.ie>). For sites where no conservation management plans are available, a list of generic conservation objectives were used as outlined below:

For SACs:

- To maintain the Annex I habitats, for which the cSAC has been selected, at favourable conservation status.
- To maintain the Annex II species, for which the cSAC has been selected, at favourable conservation status.
- To maintain the extent, species richness and biodiversity of the entire site.

For SPAs:

- To maintain the bird species of special conservation interest, for which the SPA has been listed, at favourable conservation status.

These generic objectives do not provide information on the main threats to the habitat or species interests within the SACs and SPAs. For SACs, this information is available through Ireland's Article 17 Report to the European Commission, *The Status of EU Protected Habitats and Species in Ireland* (NPWS, 2008).

2.2 Consultation

Consultation on this methodology for the Habitats Directive Assessment on the River Dodder Flood Risk Assessment and Management Plan was held with NPWS through the issuing of a report on the proposed methodology. This letter was sent to the Developments Application Unit of the Department of Environment Heritage and Local Government. This current report provides consultation on the outcomes of Stage One Screening and of the results from the appropriate assessment. This report, together with the draft CFRMP and SEA, are available for consultation and can be downloaded from Dublin City Council's website or received in hard copy at the following Dublin City Council, Dún Laoghaire-Rathdown County Council and South Dublin County Council offices (*Civic Offices, Wood Quay, Dublin 8; County Hall, Marine Road, Dun Laoghaire, County Dublin; County Hall, Tallaght, Dublin 24*).

2.3 Screening

The first stage, known as Screening, is used to determine if the plan is directly connected with or necessary to the management of a Natura 2000 site. If the answer is no, it must be determined if the plan is likely to have adverse effects on one or more Natura 2000 sites. A draft methodology to advance Stage 1 Screening is presented below.

A detailed list of all SACs and SPAs within the study area was compiled (Table 5) and the qualifying interest features for each site identified. Following this the key environmental conditions (conservation objectives) needed to support site integrity were detailed for each site as were the threats to each site.

Screening will involve a 2-step process:

- 1) Review of Natura 2000 Sites – all sites within and in the immediate vicinity of the River Dodder will initially be examined in relation to the CFRMP to compile a list of relevant sites to include in the assessment. Those sites identified will be automatically included. However, to take a precautionary approach and to follow best practice and NPWS guidance, a 15km buffer around the entire river catchment will also be applied and sites within this area will also be reviewed.

2) Within the 15km buffer the qualifying interests of all sites will be examined in order to screen out sites which are not relevant to the assessment. Such sites may include terrestrial ecosystems some distance from the complex and whose qualifying features are immobile, e.g. vegetated sea cliffs, etc. In addition, other sites may be outside the dodder catchment and have no hydrological link to the River Dodder. Such sites may be screened out where there is no potential effect to Natura 2000 sites up in the headlands due to the lack of hydrological connectivity to the river or works proposed in the lower reaches of the river.

3.0 STAGE ONE - SCREENING

3.1 Initial Screening

The preparation of the River Dodder CFRMP is not necessary for the management of any of the Natura 2000 sites in the River Dodder catchment. Therefore, further assessment of the potential impacts of the Dodder CFRAMP is required under Regulation 15 of the EU (Natural Habitats) Regulations, SI 94/1997, as amended.

3.2 River Dodder

The Dodder Habitats Management Plan (Tubridy et al., 2007), details the extent and type of habitat cover in the Dublin City Council administrative area of the Dodder Catchment. The Glenasmole Valley is both an SAC and a pNHA. The River Dodder flows through the valley where it has been impounded to create two reservoirs. The Glenasmole valley contains a high diversity of habitats and plant communities, including three habitats listed in Annex I of the EU Habitats Directive. The presence of Red Data Book plant species further enhances the conservation value of the site as does the presence of populations of several mammal and bird species of conservation interest (www.npws.ie). The Dodder valley is a pNHA. This site is the last remaining stretch of natural riverbank vegetation in the built-up Dublin area (www.iwt.ie).

Six species of bat were found during the preparation of the Dodder Habitats Management Plan. Otters (*Lutra lutra*) are also present in the Dodder Catchment. Otters are listed in Annex II and IV of the EU's Habitats Directive and in Appendix II of the Berne Convention. The otter is listed as vulnerable in the Red Data Book and is fully protected in Ireland by the Wildlife Act (Bailey & Rochford, 2006).

In addition, the River Dodder is exceptional amongst most urban rivers as it supports Atlantic salmon (*Salmo salar*), a species listed in Annex II & V of the EU Habitats Directive, Appendix II of the Berne Convention and listed as vulnerable in the Red Data Book. Reykjavík is the only other capital city in the EU which has a salmonid-supporting river. Populations of Sea Trout (*Salmo trutta morpha trutta*) in addition to resident Brown Trout (both *Salmo trutta morpha fario* and *S. trutta morpha lacustris*) are also

found. Wild brown trout are present in the River Dodder and in most of the tributaries from Bohernabreena to the sea. Wild brown trout are also present in the reservoirs at Bohernabreena and in the feeding streams above. Fishery habitat is regarded as good for all salmonid life stages throughout most of the Dodder system (Environmental Report, Ballsbridge Local Area Plan, 2007). In particular, the Owendoher stream is regarded as an important wild brown trout nursery (Kelly Quinn, 1986). Salmon can only travel upstream as far as Clonskeagh Weir. Fish populations are protected and supplemented through routine Eastern Regional Fisheries Board (ERFB) fisheries management measures, in addition to annual stocking by such organisations as the Dodder Anglers Club, which has a special interest in the river. The installation of fish passes within the catchment is intended.

The River Dodder Habitats Management Plan, 2008, also details evidence of the presence of Brook Lamprey (*Lampetra planeri*) and River Lamprey (*Lampetra fluviatilis*) in the River Dodder. Lamprey records exist from the middle section of the River Dodder and the Little Dargle stream. However there is skepticism that lamprey are present in the city section of the river due to the very fast current, unsuitability of sediment and the presence of weirs (Tubridy *et al.*, 2008). Lamprey are protected under the Habitats Directive.

3.3 Natura 2000 Sites in the vicinity of the River Dodder Catchment

Based on the methodology outlined in Section 2.3, the results of provisional screening indicated that there are 15 SACs 8 SPAs Ramsar sites (wetlands of international importance) within the 15km buffer surrounding the River Dodder Catchment.

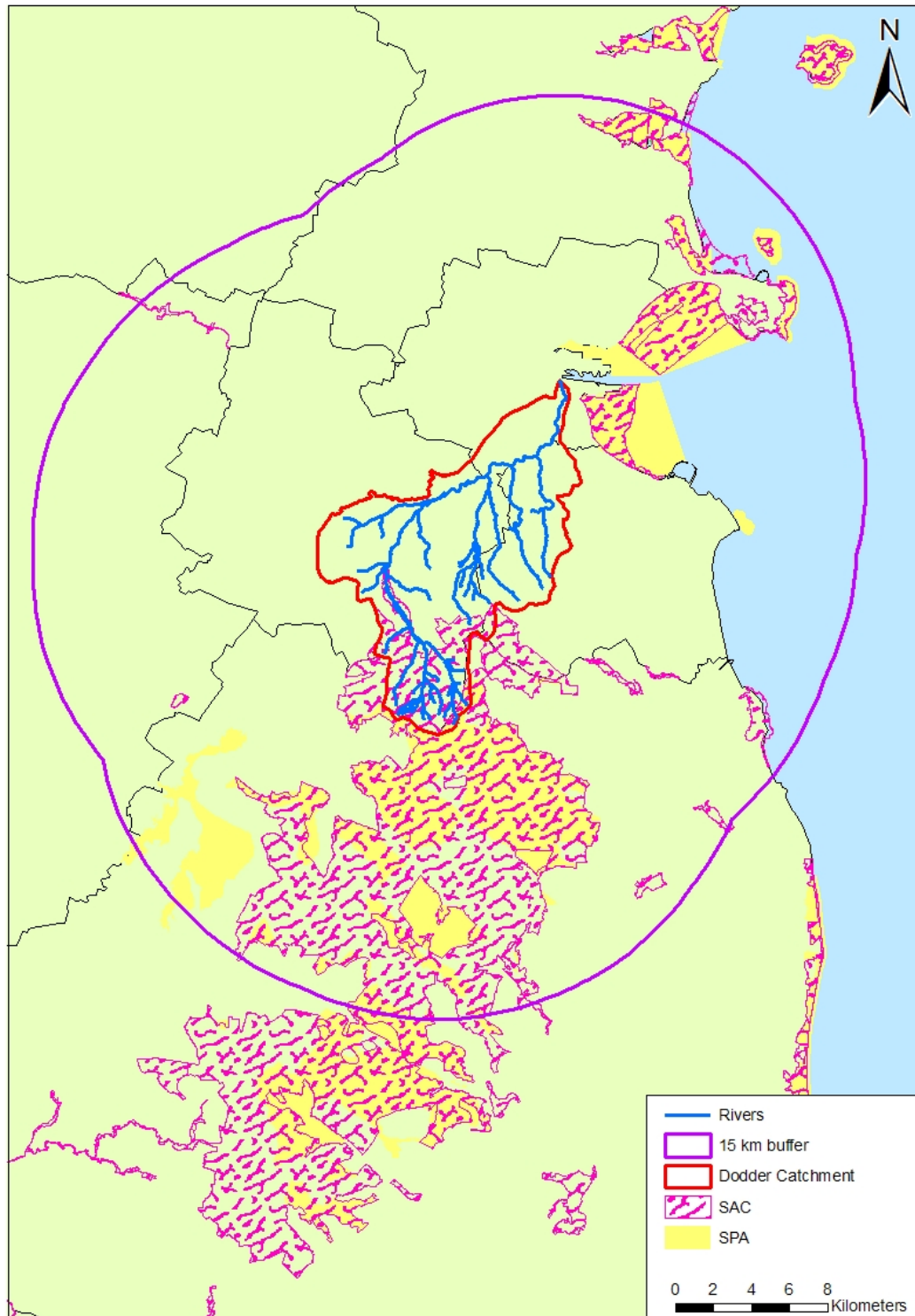
Table 3.1: SACs and SPAs located with 15 km of the River Dodder

Designation	Site Name	Site Code	Distance from the nearest proposed preferred option
Candidate Special Area of	<i>Baldoyle Bay</i>	000199	13 km
	<i>Ballyman Glen</i>	000713	12 Km
	<i>Bray Head</i>	000714	16 Km
	<i>Carriggower Bog</i>	000716	21 Km
	<i>Glen Of The Downs</i>	000719	20 Km
	<i>Glenasmole Valley</i>	001209	10 Km
	<i>Howth Head</i>	000202	12 Km
	<i>Ireland's Eye</i>	002193	15 Km

Designation	Site Name	Site Code	Distance from the nearest proposed preferred option
Conservation (cSAC)	<i>Knocksink Wood</i>	000725	10 Km
	<i>Malahide Estuary</i>	000205	18 Km
	<i>North Dublin Bay</i>	000206	5 Km
	<i>Red Bog, Kildare</i>	000397	18 Km
	<i>Rye Water Valley/Cartron</i>	001398	18 Km
	<i>South Dublin Bay</i>	000210	5.5 Km
	<i>Wicklow Mountains</i>	002122	6 Km
Special Protection Areas (SPA)	<i>Baldoye Bay SPA & Ramsar Site</i>	004016	11 Km
	<i>Broadmeadow/Swords Estuary SPA 7 Ramsar Site</i>	004025	17 Km
	<i>Howth Head Coast SPA</i>	004113	15 Km
	<i>Ireland's Eye SPA</i>	004117	16 Km
	<i>North Bull Island SPA & Ramsar</i>	004006	10 Km
	<i>Poulaphouca Reservoir SPA</i>	004063	22 Km
	<i>South Dublin Bay and River Tolka Estuary SPA & Ramsar</i>	004024	3 Km
	<i>Wicklow Mountains SPA</i>	004040	10 Km

Apart from the catchment-wide options, none of the proposed preferred options identified in the draft CFRMP, as listed in Section 1.3 of this document, are situated within or adjacent to any of the Natura 2000 sites identified within the 15 km buffer.

Fig. 3.1: Outline of all Natura 2000 sites (SACs and SPAs) with a 15 km buffer of the River Dodder Catchment.



3.4 Identification of Potential Impacts

The potential impacts to Natura 2000 sites from the identified preferred options are impacts related to changes in water level and are detailed in the following table.

Table 3.2: Potential hydrological impacts associated with Preferred Options

Preferred Options		Potential Issues
1	Support measures: <ul style="list-style-type: none"> • SuDS; • asset surveys; • maintenance; • early coastal warning; • public awareness; • monitoring; • policy measures 	<p>SuDS effectively delay the discharge of surface water and storm water into the river system. Though peak flows are likely to be reduced, high water levels may be prolonged by these systems. This is unlikely to negatively affect protected areas. In fact, these systems are likely to have a positive effect in terms of flood and pollutant attenuation.</p> <p>The non-structural measures do not involve physical works on the ground but are associated with management systems such as flood forecasting and inspection programme of the defence assets in place within the catchment to determine maintenance requirements etc.</p> <p>All of these non-structural measures were determined not to have any potential effects on Natura 2000 sites given that they do not involve any structural changes or alterations within the river eco-system. The implementation of these proposed options would be neutral to the qualifying features of the protected habitats and species, while at the same time they would have potential benefits to the general public in taking action to prepare for and mitigate the impact of flooding.</p>
2	Hard Defences – Embankments	This involves the building of a new embankment set back from but along the river channel. This would reduce the floodplain storage along the bank side and may temporarily raise water levels upstream during times of flood flow. The embankments may affect localised areas upstream of the defences during high flows.
3	Hard Defences – Flood Walls	This involves the building of a new wall structure set back as far as is reasonably practicable from the river bank up to a designed flood level (e.g. wall height = 1 in 100 year flood level plus freeboard). This would reduce the floodplain storage along the bank side and may temporarily raise water levels in the river at the location and upstream during times of flood flow. The flood walls may affect localised areas upstream of the defences during high flows.
4	Hard Defences – Parapet	Parapets would involve the reconstruction of existing bridge parapet walls in order to retain water levels during the design flood event. This may affect localised areas upstream of the bridge structure during high flows.

Preferred Options		Potential Issues
5	Dredging / Channel Regrading	Dredging is the process of removing silt from the bottom and sides of a river channel. River dredging is normally done when there is a need to increase the depth of the river. Dredging will increase the channel conveyance. Dredging will target areas where out of bank flooding occurs due to insufficient channel capacity and will have the effect of keeping more water within the channel than is the case presently.
6	Removal of Weir	The removal of a weir will instantly prevent the backing up of water behind the site of the weir. This will result in lowering the level of the water in the river at that point during flood flow and will allow for a more natural flow of water through the channel at that point.

3.5 Assessment of likely impacts on Natura 2000 Sites

An examination of the list of Natura 2000 sites identified in step 1 of screening (listed in Table 5) based on the preferred options and their related potential issues, some Natura 2000 can be screened out of the assessment for the following reasons:

- (i) The Natura 2000 Site selected with the 15km buffer, is located outside the river Dodder catchment. As there is no hydrological connection to the Dodder and the Natura 2000 site, no significant effect is likely as a result of implementation of any of the preferred options proposed in the CFRMP.
- (ii) Due to the physical distance of the Natura 2000 Site from the Flood Cell and the higher altitude of the Natura 2000 site above the flood cell, there is no hydrological influence upstream towards the Natura 2000 site, and therefore, no significant effect to the Natura 2000 is likely as a result of implementation of the CFRMP.

Furthermore, the potential for significant effects for some other sites was not as certain upon quick examination of the information to hand due to their location, downstream of the Dodder, within the influence of estuarine and tidal waters. In line with the use of the precautionary principle in Appropriate Assessment, these sites are not screened out and remain included for assessment.

Table 3.3: Summary of Assessment of likely impacts on Natura 2000 sites

Site Name	Site Code	Potential Effects	Justification
<i>Baldoyle Bay cSAC</i>	000199	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Ballyman Glen cSAC</i>	000713	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Bray Head cSAC</i>	000714	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Carriggower Bog cSAC</i>	000716	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Glen Of The Downs cSAC</i>	000719	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Glenasmole Valley cSAC</i>	001209	Not certain	Unclear (precautionary principle requires site to be included in Appropriate Assessment)
<i>Howth Head cSAC</i>	000202	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Ireland's Eye cSAC</i>	002193	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Knocksink Wood cSAC</i>	000725	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Malahide Estuary cSAC</i>	000205	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>North Dublin Bay cSAC</i>	000206	Not certain	Precautionary principle requires site to be included in Appropriate Assessment
<i>Red Bog, Kildare cSAC</i>	000397	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>Rye Water Valley/Carlton cSAC</i>	001398	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>South Dublin Bay cSAC</i>	000210	Not certain	Precautionary principle requires site to be included in Appropriate Assessment
<i>Wicklow Mountains cSAC</i>	002122	Not certain	Precautionary principle requires site to be included in Appropriate Assessment
<i>Baldoyle Bay SPA</i>	004016	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Broadmeadow/Swords Estuary SPA</i>	004025	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Howth Head Coast SPA</i>	004113	No	Due to distance from the options and the high altitude of the site, there is no hydrologic influence and no significant effect is likely.
<i>Ireland's Eye SPA</i>	004117	No	Due to distance from the options and the high altitude of the site, there is no hydrologic

Site Name	Site Code	Potential Effects	Justification
			influence and no significant effect is likely.
<i>North Bull Island SPA</i>	004006	Not certain	Precautionary principle requires site to be included in Appropriate Assessment
<i>Poulaphouca Reservoir SPA</i>	004063	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.
<i>South Dublin Bay and River Tolka Estuary SPA</i>	004024	Not certain	Precautionary principle requires site to be included in Appropriate Assessment
<i>Wicklow Mountains SPA</i>	004040	No	Site is located completely outside of Dodder catchment with no hydrological connection to the Dodder and no significant effect is likely.

3.6 Relevant Natura 2000 Sites Provisional Results from Screening

As outlined in Table 7, some Natura 2000 sites were screened out and not considered in the assessment as they are outside the River Dodder catchment boundary and are not hydrologically connected to the Dodder river system and, therefore, will not be affected by the CFRMP. In summary, six Natura 2000 sites progressed through screening and required Stage 2 Appropriate Assessment including:

- Glenasmole Valley SAC (Code 001209)
- North Dublin Bay SAC (Code 000206)
- South Dublin Bay SAC (Code 000210)
- Wicklow Mountains SAC (Code 002122)
- North Bull Island SPA & RAMSAR site (004006)
- South Dublin Bay and River Tolka Estuary SPA & RAMSAR site (Code 004024)

3.7 Identification of Potential Impacts following an examination of the characteristics of the designated sites.

Glenasmole Valley SAC (001209)

Glenasmole Valley in south Co. Dublin lies on the edge of the Wicklow uplands, approximately 5 km from Tallaght. The River Dodder flows through the valley and has been impounded here to form two reservoirs which supply water to Dublin. Glenasmole Valley contains a high diversity of habitats and plant communities, including three habitats listed on Annex I of the EU Habitats Directive. The presence of four Red Data Book plant species further enhances the value of the site as does the presence of populations of several mammal and bird species of conservation interest. The details of the qualifying interests for which the site is identified are listed in Table 8 below.

Table 3.4: Natura 2000 site qualifying interests

Glenasmole Valley SAC Qualifying Interests	
Habitat types listed in Annex II of Council Directive 92/43/EEC (*denotes priority habitat)	Qualifying Interest Code
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)	6210
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	6410
Petrifying springs with tufa formation (Cratoneurion)	7220

The draft conservation objectives for Glenasmole Valley SAC are:

- (i) To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.
- (ii) To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.
- (iii) To maintain the extent, species richness and biodiversity of the entire site.
- (iv) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the Glenasmole Valley SAC. This Natura 2000 site is located in the upper reaches of the Dodder catchment with the closest preferred option identified proposed for the Whitechurch River, some 10 km downstream. Changes to hydrology due to the implementation of the preferred option on the Whitechurch River will not manifest upstream to the Glenasmole Valley SAC, thus, no potential impacts are expected to any of the qualifying features of this Natura 2000 site.

North Dublin Bay SAC (000206) also comprises North Bull Island Ramsar Site

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site. The island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. The island shelters two intertidal lagoons which are divided by a solid causeway. This site is an excellent example of a coastal site with all the main habitats represented. There are good examples

of ten habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a number of rare and scarce plants including some which are legally protected.

Table 3.5: Natura 2000 site qualifying interests

North Dublin Bay SAC Qualifying Interests - also comprises North Bull Island Ramsar Site (406)	
Habitat types listed in Annex II of Council Directive 92/43/EEC	Qualifying Interest Code
Mudflats and sandflats not covered by seawater at low tide	1140
Salicornia and other annuals colonizing mud and sand	1310
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1330
Mediterranean salt meadows (Juncetalia maritimi)	1410
Annual vegetation of drift lines	1210
Embryonic shifting dunes	2110
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)	2120
Fixed coastal dunes with herbaceous vegetation (grey dunes)	2130
Humid dune slacks	2190
<i>Spartina</i> swards (<i>Spartinion maritimae</i>)	1320
<i>Petalophyllum ralfsii</i>	1395

The draft conservation objectives for North Dublin Bay SAC are:

- (i) To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.
- (ii) To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.
- (iii) To maintain the extent, species richness and biodiversity of the entire site.
- (iv) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the North Dublin Bay SAC. The Natura 2000 site is located over 5 km downstream of the mouth of the River Dodder, out in Dublin Bay, and

about 8 kilometres from the nearest proposed preferred option. A potential impact from the implementation of the preferred options is increased sediment transport from the Dodder river system in to Dublin Bay and may reach the Natura 2000 site. In some circumstances flood defences can have the effect of funnelling flow past the new structures, the increased flood flow being entrained in a narrow envelope, with consequent increases in velocities at the downstream end. Such velocities can have a scouring impact at the downstream end. The ponded area upstream of the weirs identified for removal may have deep deposits of soft silt. The removal of the weir has the potential to release this accumulated silt in to the river system immediately downstream of the weir. It is likely that the silt would eventually clear from the area resulting in the restoration of the habitat quality. Whereas construction generated pollution will be temporary in duration, the potential impacts could be longer in duration and are rated as major. Suspended solids and other pollutants generated by construction of flood defences could have negative impacts on downstream flora and fauna. However, the Natura 2000 sites downstream are located 5 kilometres out in the bay. Increased sediment loading from the River Dodder in to Dublin Bay would not be expected to significantly effect North Dublin Bay SAC due to sufficient dilution in the estuary and the greater tidal influence.

South Dublin Bay SAC (000210) also contains Sandymount Strand/Tolka Estuary Ramsar Site

This site lies south of the River Liffey and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats, a habitat listed on Annex I of the E.U. Habitats Directive. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion gates. The main channel which drains the area is Cockle Lake. This site is a fine example of a coastal system with extensive sand and mudflats, a habitat listed on Annex I of the E.U. Habitats Directive. South Dublin Bay is also an internationally important bird site. South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215),

Ringed Plover (120), Sanderling (344) and Dunlin (2628), Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Geese regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the EU Birds Directive, also occur.

Table 3.6: Natura 2000 site qualifying interests

South Dublin Bay SAC Qualifying Interests - also contains Sandymount Strand/Tolka Estuary Ramsar Site (832)	
Habitat types listed in Annex II of Council Directive 92/43/EEC	Qualifying Interest Code
Mudflats and sandflats not covered by seawater at low tide.	1140
The site is important for various species of waterbirds, supporting internationally important numbers of Brent Geese and large numbers of roosting gulls and terns. Various species of annalids, bivalves and small gastropods occur. Bait-digging is a regular activity on the sandy flats.	

The draft conservation objectives for South Dublin Bay SAC are:

- (i) To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.
- (ii) To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.
- (iii) To maintain the extent, species richness and biodiversity of the entire site.
- (iv) To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the South Dublin Bay SAC. The Natura 2000 site is located 5.5 km downstream from the mouth of the River Dodder, out in Dublin Bay. A potential impact from the implementation of the preferred options is increased sediment transport from the Dodder river system in to Dublin Bay and may reach the Natura 2000 site. Similar to North Dublin Bay SAC, increased sedimentation could have negative impacts on downstream flora and fauna but are unlikely to alter the dynamics of the SAC habitat. Suspended solids and other pollutants generated by construction of flood defences could have negative impacts on downstream flora and fauna. However, the

Natura 2000 sites downstream are located many kilometres out in the estuary. Increased sediment loading from the River Dodder in to Dublin Bay would not be expected to significantly effect South Dublin Bay SAC due to sufficient dilution in the estuary and the greater tidal influence.

Wicklow Mountains SAC (002122)

This site is a complex of upland areas in Counties Wicklow and Dublin, flanked by Poulaphuca Reservoir to the west and Vartry Reservoir in the east, Cruagh Mt. in the north and Lybagh Mt. in the south. Most of the site is over 300m, with much ground over 600m and the highest peak of Lugnaquilla at 925m. Wicklow Mountains is important as a complex, extensive upland site. It shows great diversity from a geomorphological and a topographical point of view. The vegetation provides examples of the typical upland habitats with heath, blanket bog and upland grassland covering large, relatively undisturbed areas. The site supports a range of rare plant species, which are listed in the Irish Red Data Book: Parsley Fern (*Cryptogramma crista*), Marsh Clubmoss (*Lycopodiella inundata*), Greater Broom-rape (*Orobancha rapum-genistae*), Alpine Lady's-mantle, Alpine Saw-wort, Lanceolate Spleenwort (*Asplenium billotii*), Small White Orchid (*Pseudorchis albida*) and Bog Orchid (*Hammarbya paludosa*). The latter three species are legally protected under the Flora (Protection) Order, 1999. The rare Myxomycete fungus, *Echinostelium colliculosum*, has been recorded from the Military Road.

In all ten habitats listed on Annex I of the EU Habitats Directive are found within the site. Several rare, protected plant and animal species occur.

Table 3.7: Natura 2000 site qualifying interests

Wicklow Mountains SAC Qualifying Interests	
Habitat types listed in Annex II of Council Directive 92/43/EEC (*denotes priority habitat)	Qualifying Interest Code
Blanket bog (*active only)	7130
Northern Atlantic wet heaths with <i>Erica tetralix</i>	4010
European dry heaths	4030
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in British Isles	91A0
Siliceous rocky slopes with chasmophytic vegetation	8220
Calcareous rocky slopes with chasmophytic vegetation	8210
Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)	8110
Alpine and Boreal heaths	4060

Natural dystrophic lakes and ponds	3160
Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	3130
Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)	6230
Mammals listed in Annex II of Council Directive 92/43/EEC	
<i>Lutra lutra</i>	1355

The principal objectives for the management of Wicklow Mountains National Park (WMNP) are:

- (i) To maintain and where possible enhance the ecological value of all natural and seminatural habitats and geological features within WMNP – blanket bog, heath, lakes and rivers, woodlands, exposed rock, grasslands and scrub.
- (ii) To maintain and where possible increase the populations of rare and protected plant and animal species including Lanceolate Spleenwort, Parsley Fern, Small White Orchid, Bog Orchid, Peregrine Falcon, Merlin and Otter.
- (iii) To establish and continue effective liaison with all interested parties in order to effectively manage WMNP.
- (iv) To encourage sustainable recreational and educational use of WMNP, to provide information and facilities for visitors and to improve public awareness of the natural heritage of the area, taking into account the social and economic needs of the communities in the area.
- (v) To maintain cultural features within WMNP, particularly those associated with the monastic settlement at Glendalough.
- (vi) To maintain landscape, aesthetic and other qualities in the environs of WMNP, through liaison with neighbouring landowners and others concerned.
- (vii) To undertake or facilitate research necessary to achieve the conservation objectives.
- (viii) To purchase, if desirable, lands and rights, by mutual agreement, in areas adjacent to WMNP, should they become available, in order to consolidate existing WMNP lands.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the Wicklow Mountain SAC. This Natura 2000 site

is located in the upper reaches of the Dodder catchment with the closest preferred option identified proposed for the Whitechurch Stream, some 7 km downstream. Due to this distance, changes to hydrology due to the implementation of the preferred option on the Whitechurch Stream will not manifest upstream to the Wicklow Mountain SAC. Thus, no potential impacts are expected to any of the qualifying features of this Natura 2000 site.

North Bull Island SPA (004006)

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton.

Part of the interior of the island has been converted to golf courses. The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Lightbellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl.

Table 3.8: Natura 2000 site qualifying interests

North Bull Island SPA Qualifying Interests - also contains North Bull Island Ramsar Site (406)
Birds Listed in Annex 1 of Council Directive 79/409/EEC
The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. It also qualifies for international importance as the numbers of two species exceed the international threshold – Brent Goose and Bar-tailed Godwit. A further 15 species have populations of national importance – Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Curlew, Redshank and Turnstone.

The draft conservation objectives for North Bull Island SPA are:

- (i) To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.
- (ii) Favourable conservation status of a habitat is achieved when its natural range, and the area it covers within that range, is stable or increasing, and the

ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable as defined below.

- (iii) The favourable conservation status of a species is achieved when: population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the North Bull Island SPA. The Natura 2000 site is located 10 km downstream from the mouth of the River Dodder, out in Dublin Bay. A potential impact from the implementation of the preferred options is increased sediment transport from the Dodder river system in to Dublin Bay and may reach the Natura 2000 site. Suspended solids and other pollutants generated by construction of flood defences could have negative impacts on downstream flora and fauna. However, the Natura 2000 sites downstream are located many kilometres out in the estuary. Any increased sediment loading at the mouth of the River Dodder arising from the proposed works would be expected to quickly settle out of suspension in the large, open, and tidally influenced, waters of Dublin Bay. Therefore, it would not be expected to be significantly effect North Bull Island SPA.

South Dublin Bay and River Tolka Estuary SPA (004024)

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included. In the south bay, the intertidal flats extend for almost 3 km at their widest. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend

most of their time there. The South Dublin Bay and River Tolka Estuary SPA is of international importance for Light-bellied Brent Goose and of national importance for nine other waterfowl species. As an Autumn Tern Roost, it is also of international importance. Furthermore, the site supports a nationally important colony of Common Tern. All of the Tern species using the site are listed on Annex I of the E.U. Birds Directive, as are Bartailed Godwit and Mediterranean Gull.

Table 3.9: Natura 2000 site qualifying interests

South Dublin Bay and River Tolka Estuary SPA Qualifying Interests
Birds Listed in Annex 1 of Council Directive 79/409/EEC
An internationally important population of Brent Goose occurs regularly and newly arrived birds in the autumn feed on the eelgrass bed at Merrion. The site supports nationally important numbers of a further six species: Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin and Bar-tailed Godwit. Other species which occur in smaller numbers include Great Crested Grebe, Grey Plover, Curlew, Redshank and Turnstone.

The draft conservation objectives for South Dublin Bay and River Tolka Estuary SPA are:

- (i) To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.
- (ii) Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable as defined below.
- (iii) The favourable conservation status of a species is achieved when: population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Apart from the support measures, the preferred options proposed in the Dodder CFRMP are not located within or adjacent to the South Dublin Bay & River Tolka SPA. The Natura 2000 site is located over 3.5 km downstream from the mouth of the River Dodder, out in Dublin Bay. A potential impact from the implementation of the preferred options is increased sediment transport from the Dodder river system in to Dublin Bay and may

reach the Natura 2000 site. Suspended solids and other pollutants generated by construction of flood defences could have negative impacts on downstream flora and fauna. However, the Natura 2000 sites downstream are located many kilometres out in the estuary. Any increased sediment loading at the mouth of the River Dodder arising from the proposed works would be expected to quickly settle out of suspension in the large, open, and tidally influenced, waters of Dublin Bay. Therefore, it would not be expected to be significantly effect the South Dublin Bay & River Tolka SPA.

4.0 ASSESSMENT OF SIGNIFICANCE

A precautionary approach was taken in that, with cases of uncertainty; it was assumed the effects could be significant. Examples of significance indicators of impact from Commission Guidance (EC, 2002) as listed below were used in the assessment:

- Loss of habitat area;
- Fragmentation (duration or permanence, level in relation to original extent);
- Disturbance (duration or permanence, distance from site);
- Species population density (timescale for replacement);
- Water resource (relative change);
- Water Quality (relative change in key indicators chemical and other elements).

4.1 Assessment of Significance

Each of these indicators was assessed for each SAC and SPA identified during the previous stages where there is potential for impact. A summary of this assessment is outlined in **Table 4.1**. As a guide, any measure that had the potential to affect the conservation objectives of a Natura 2000 site, including its structure and function, should be considered significant.

Table 4.1: Potential Impacts on SACs from the Proposed Preferred Options.

Potential Impact	SAC 001209 Glenasmole Valley	SAC 000206 North Dublin Bay	SAC 000210 South Dublin Bay	SAC 002122 North Bull Island	SPA 004006 North Bull Island SPA	SAC 004024 South Dublin Bay & River Tolka Estuary
Loss of habitat area	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Fragmentation	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Disturbance	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Species population density	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Water resource	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Water quality	No impact on qualifying feature	Potential impact to qualifying feature	Potential impact to qualifying feature	Potential impact to qualifying feature	Potential impact to qualifying feature	Potential impact to qualifying feature

Table 4.2. Summary of Residual Impacts in the Absence of Mitigation.

	Impact During Works			Long-term Impact		
Flood Relief Works	Suspended Solids Pollution	Other Pollutants	Obstruction to Fish Movement	Loss of Instream Habitat & Populations of Rare Species	Hydrological Impacts	Long-term Impact on Fish Movement
<i>Hard Defences</i>	Major	Major	Minor	Major	Uncertain	None
<i>Dredging</i>	Major	Major	Major	Major	Uncertain	None
<i>Weir Removal</i>	Major	Major	Major	Major	Uncertain	Moderate Positive Impact
<i>SUDS</i>	None	None	None	None	Positive impacts	None

4.2 Cumulative Impacts

For Appropriate Assessment, it is required to identify all those elements of other plans/programmes that have the potential for having significant effects on the Natura 2000/Ramsar Sites either alone or in combination with each other or with the Dodder CFRMP. Therefore, an assessment of the ‘in combination’ effects from the various preferred options was also carried out. The scope of the assessment was set at the Dodder catchment level to capture, not only the other preferred options in the catchment but also other plans. In reviewing other plans/programmes, the following *assessment questions* were asked:

- Will the other preferred options identified in the Dodder CFRMP together have combined effects that may lead to the *probability* or the *risk* of having a significant effect on a designated site?
- Will other plans/programmes (listed in Appendix C) undermine the site’s conservation objectives?
- Will these other plans/programmes lead to the probability or the risk of having a significant effect on a designated site either;
 - a) in combination with other plans/programmes as outlined, or
 - b) in combination with the Dodder CFRMP

The overall in-combination effect is a key part of the screening process as it ensures plans or policies are captured that would not trigger a likely significant effect on their own. The assessment of cumulative impacts is included within the Screening Tables of Appendix B. It is concluded that:

- No significant cumulative or “in combination” effects are likely at a strategic level or to any Natura 2000 sites. However there is potential for such impacts at a local level (*on the Eastern RBD Management Plan; Biodiversity Action Plans and Local Area Plans*) as a result of the loss of river margin habitat with its associated flora and fauna, should the preferred options be constructed in the absence of adequate mitigation.
- There is potential for cumulative effects from implementation of all the preferred options in the absence of mitigation measures to prevent the release of sediment

into the water course. The potential for high loadings of total solids released into the water is significant if no mitigation measure is in place.

4.3 Screening Statement

Following the identification of potential impacts, the assessment of the likely significance of impacts and the assessment of cumulative impacts, it can be concluded that there is no potential for significant negative impacts on identified designated Natura 2000 sites from the proposed preferred options.

However, there is potential for negative effects on habitats and protected species within the Dodder catchment that, though they are not qualifying interests in the currently designated Natura 2000 sites, are identified in The Dodder Habitats Management Plan (Tubridy *et al.*, 2007). In particular, the potential impacts from increased sediment loading on habitats and species such as otter, lamprey and salmonids are of concern. Otter are listed in Annex II and IV of the EU's Habitats Directive and in Appendix II of the Berne Convention. Lamprey are also protected under the Habitats Directive.

Therefore the prevention principle to “*avoid, in special areas of conservation, the deterioration of natural habitats*” (Article 6(2)) still applies. Guidance on the application of Article 6 (3) of the directive (European Commission, 2001) indicates that where the potential for significant negative impacts exists, the assessment process should proceed to Stage 2 – Appropriate Assessment, where potential impacts will be discussed in a more comprehensive manner and detailed mitigation measures will be provided which aim to minimise/ avoid risks to sensitive receptors.

5.0 STAGE TWO (APPROPRIATE ASSESSMENT PHASE)

5.1 Introduction to the appropriate assessment

This stage of the assessment process considers the impacts (whether they are direct, indirect, short term, long term, constructional, operational or cumulative in conjunction with other plans or projects) that the proposed preferred options contained in the Dodder CRFMP will have on the integrity of Natura 2000 Sites with respect to the conservation objectives of the sites and to their structure and function. EC guidance (Managing Natura 2000 Sites) states that the integrity of a site involves its ecological functions and the decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives (EC 2000). This stage of the Appropriate Assessment consists of four main steps, namely;

- **Step One** – *Information required*, where the conservation objectives of the site are reviewed and the aspects of the proposed plan or project which affect these conservation objectives are identified.
- **Step Two** – *Impact Prediction*, where the likely impacts of a project or plan are examined. These include direct/indirect, short/long term, construction/operational/decommissioning, isolated, interactive and cumulative effects.
- **Step Three** – *Conservation Objectives*, where the effects of a project or plan are assessed as to whether they have any adverse effects on the integrity of the site as defined by its conservation objectives.
- **Step Four** – *Mitigation Measures*, where the level of mitigation (top of mitigation hierarchy) is assessed against the adverse effects that the project or plan is likely to cause.

5.2 APPROPRIATE ASSESSMENT STEP ONE – INFORMATION REQUIRED

A detailed description of all Natura 2000 sites is provided in Section 3.6 and Appendix A. Key qualifying features for each under consideration regarding potential impacts are also detailed and this information was used to determine impact prediction.

5.3 APPROPRIATE ASSESSMENT STEP TWO – IMPACT PREDICTION

Predicting the likely impacts of a plan or project on protected sites and species can be difficult, as the elements that make up the ecological structure and function of a site are dynamic and not easily measured. Potential impacts to sensitive receptors are short-term during the construction phase and are listed below. Suspended sediment due to runoff of soil from flood defense construction areas, or due to disturbance of fine sub-surface sediments in the course of in-water construction, channel re-grading and deepening can have severe negative impacts on:

- water quality;
- invertebrate and plant life; and
- on all life stages of fish.

The potential exists for a range of other pollutants to enter the river during flood defence construction or instream works. For example any of the following will have deleterious effects on fish, plants and invertebrates if allowed to enter water.

- Raw or uncured concrete and grouts;
- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks;
- Fuels, lubricants and hydraulic fluids for equipment used in bankside or instream works;
- Bitumen and silanes used for waterproofing concrete surfaces.

Whereas construction-generated pollution will be temporary in duration, the potential impacts could be longer in duration and are rated as major. Instream construction works, or dredging if carried out at the time of upstream spawning migrations. can have

significant disrupting affects on salmonids, causing them to spawn in sub-optimal locations.

Construction of flood defences or the operation of machinery during instream channel alteration works can result in the loss of bankside habitat. Loss of bankside vegetation can have a significant negative impact on the ecological quality of rivers by:

- i. Decreasing plant, invertebrate and bird biodiversity;
- ii. Removing an important breeding area for insects, resulting in a reduction in insects which are an important food source for fish;
- iii. Removing vital habitat for many species of wildfowl and mammals such as otters;
- iv. Removing the protective function of natural bankside habitat which intercepts nutrient and suspended solids runoff from surrounding land, and anchors the riverside soils, protecting them from erosion, particularly during high winter water levels.

Loss of instream habitat due to damming of river margins to facilitate construction of flood walls and embankments and access for instream works, will result in the loss of existing river substrates with their associated flora and fauna.

In some circumstances flood defenses can have the effect of funneling flow past the new structures, the increased flood flow being entrained in a narrow envelope, with consequent increases in velocities at the downstream end. Such velocities can have a scouring impact at the downstream end. There is potential for increased sedimentation of the river channel with consequent impacts to water quality and disturbance to otter, lamprey species and salmonids.

5.4 APPROPRIATE ASSESSMENT STEP THREE – CONSERVATION OBJECTIVES

Predicted Impacts on the Qualifying Interests of Natura 2000 Sites

In the event that no conservation plan was available for a specified Natura 2000 site (SAC or SPA) a precautionary approach was therefore required with regards to any measure which may potentially impact ecological features within this SAC/SPA. Key qualifying features of the SAC described will form the basis of any future management plan. The aim of such a management plan is likely to be to maintain or improve the populations of species described and maintain or enhance habitat quality, and therefore for sites with no specific management plan the following 4 generic key environmental conditions to support site integrity were used:

For SACs:

- To maintain the Annex I habitats for which the SAC has been selected at favourable conservation status;
- To maintain the Annex II species for which the SAC has been selected at favourable conservation status;
- To maintain the extent, species richness and biodiversity of the entire site; and
- To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

For SPAs:

- To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.

These are detailed along with specific key environmental conditions from specific Site Management Plans (where they exist) and are detailed in the Screening Tables in Appendix B to provide ecological focused screening using best available scientific information. The results of Potential Impacts and Mitigation identified are detailed in the final column in the tables of Appendix B.

5.5 APPROPRIATE ASSESSMENT STEP FOUR – MITIGATION MEASURES

For the purposes of this report the term “mitigation measures” are considered to be *“those measures which aim to minimise, or even cancel, the negative impacts on a site that are likely to arise as a result of the implementation of a plan or project. These measures are an integral part of the specifications of a plan or project”*. (Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC, January 2007).

The following text sets out in summary the mitigation measures and how they might be implemented.

1. (Measure 1) Works should only be carried out after a method statement, detailed plans and timing of works have been agreed with Inland Fisheries Ireland.
2. (Measure 2) Where construction of flood defences pose a significant risk of suspended solids and other pollution, the area of the proposed works should be isolated using dams. If de-watering is necessary to allow works to proceed, water pumped from the contained area should be passed through a settlement pond or pre-fabricated settlement tanks with oil interceptor before being discharged to the river.
3. (Measure 3) Areas which will be dammed and dewatered should be kept to the minimum required. Except where absolutely necessary, machinery should operate from the bankside and not instream. No instream works should be carried out without the prior approval of the NPWS and Inland Fisheries Ireland.
4. (Measure 4) Before any area is de-watered, suitable juvenile lamprey habitat, and suitable salmonid nursery habitat in adjacent areas of river should be identified.

5. (Measure 5) Following installation of dams, the enclosed waters should be electrofished by an operator (licensed by NPWS and Department of the Marine). All lamprey and juvenile salmonids captured should be transferred to selected nearby habitat. All other fish should be released to the river.
6. (Measure 6) For construction activities close to the river bank, eroded sediments should be retained on site with erosion and sediment control structures such as sediment traps, silt fences and sediment control ponds. Sediment ponds and grit/oil interceptors should be placed at the end of drainage channels.
7. (Measure 7) Special measures are required to prevent the large volumes of fine sediments which may have accumulated upstream of weirs (identified for removal) from being released into the River and further downstream into the estuary. The method whereby this should be achieved will have to be agreed with IFI prior to commencement of the works. It is likely that the most effective method would be to remove fine sediment deposits prior to removal of the weir using suction dredging. The work should be carried out only at low flows and silt blankets or other silt filtering measures should be put in place across the river downstream of the works area. Dredged sediments should be disposed of in a location where they cannot erode into adjacent watercourses.
8. (Measure 8) No instream works, including weir removal should be carried out during the period October to June inclusive without the agreement of IFI.
9. (Measure 9) Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks should be trapped on-site to allow sediment to settle out and reach neutral pH before clarified water is released to the river or drain system or allowed to percolate into the ground. Where possible pre-cast concrete should be used.

10. (Measure 10) To prevent the washing away of marginal silt deposits where juvenile lamprey are found, and potential displacement of juvenile salmonid fish, the removal of any weirs should be carried out gradually and in stages.

5.6 Appropriate Assessment of Mitigation Measures

These mitigation steps were subsequently assessed (Table 5.1) but no impacts to Natura 2000 sites were identified.

As stated in NPWS Guidance Document (2009), the requirement of the AA is not to prove what the impacts and effects will be, but rather to establish beyond reasonable scientific doubt that adverse effects on site integrity will not result. The mitigation outlined in Section 5.5 was designed in consultation with expert opinion from NWPS ecologists and is proposed to achieve the aim of the Appropriate Assessment. Due to the identification of appropriate and sufficient mitigation there is no need to identify alternative solutions and the Appropriate Assessment is complete as it does not need to proceed to Stage 3 (Alternative Solutions) or Stage 4 (Derogation) of the Appropriate Assessment process (see Figure 3 in Section 1.4).

Table 5.1: Potential Impacts on SACs from the Proposed Mitigation Measures.

Measure	SAC 001209 Glenasmole Valley	SAC 000206 North Dublin Bay	SAC 000210 South Dublin Bay	SAC 002122 North Bull Island	SPA 004006 North Bull Island SPA	SAC 004024 South Dublin Bay & River Tolka Estuary
Measure 1	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 2	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 3	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 4	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 5	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 6	No impact on qualifying feature	No impact on qualifying feature	Potential impact to qualifying feature	No impact on qualifying feature	No impact on qualifying feature	Potential impact to qualifying feature
Measure 7	No impact	No impact on	No impact on	No impact on	No impact	No impact on

Measure	SAC 001209 Glenasmole Valley	SAC 000206 North Dublin Bay	SAC 000210 South Dublin Bay	SAC 002122 North Bull Island	SPA 004006 North Bull Island SPA	SAC 004024 South Dublin Bay & River Tolka Estuary
	on qualifying feature	qualifying feature	qualifying feature	qualifying feature	on qualifying feature	qualifying feature
Measure 8	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 9	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature
Measure 10	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature	No impact on qualifying feature

6.0 APPROPRIATE ASSESSMENT CONCLUSION

Following the implementation of mitigation described in this Appropriate Assessment it is expected that the implementation of preferred options detailed in the Dodder CFRMP will avoid significant negative impacts to key sensitive receptors and other qualifying features of the Natura 2000 sites. Guideline mitigation is detailed here which aims to reduce all risks particularly associated with release of significant sediment loads in to the river and subsequent impacts to protected habitats and species (listed in The Dodder Habitats Management Plan) such as otter, lamprey and salmonids. This mitigation should be incorporated into final detailed site design. There should therefore be no requirement for Stage 3 (*Assessment of Alternative Solutions*) and 4 (*Assessment Where Adverse Impacts Remain*), of the appropriate assessment process.

REFERENCES

Council Directive 79/409/EEC on the conservation of wild birds (the 'Birds Directive').

Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the 'Habitats Directive')

Department of Environment, Heritage and Local Government Circular Letter SEA 1/08 & NPWS 1/08. Appropriate Assessment of Land Use Plans. 15 February, 2008

Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on *Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities* March 2010.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

The Dodder Habitats Management Plan. (Tubridy et al., 2007)

Appendix A

Natura 2000 Site Synopsis

SITE SYNOPSIS

SITE NAME: BALDOYLE BAY

SITE CODE: 000199

Baldoyle Bay extends from just below Portmarnock village to the west pier at Howth, Co. Dublin. It is a tidal estuarine bay protected from the open sea by a large sand-dune system. Two small rivers, the Mayne and the Sluice, flow into the bay. The site contains four habitats listed on Annex I of the EU Habitats directive: *Salicornia* mud, Mediterranean salt meadows, Atlantic salt meadows and Tidal mudflats.

Large areas of intertidal flats are exposed at low tide. These are mostly sands but grade to muds in the inner sheltered parts of the estuary. Extensive areas of Common Cord-grass (*Spartina anglica*) occur in the inner estuary. Both the Narrow-leaved Eelgrass (*Zostera angustifolia*) and the Dwarf Eelgrass (*Z. noltii*) are also found here. During summer, the sandflats of the sheltered areas are covered by mats of green algae (*Enteromorpha* spp. and *Ulva lactuca*).

The sediments have a typical macrofauna, with Lugworm (*Arenicola marina*) dominating the sandy flats. The tubeworm *Lanice conchilega* is present in high densities at the low tide mark and the small gastropod *Hydrobia ulvae* occurs in the muddy areas, along with the crustacean *Corophium volutator*.

Areas of saltmarsh occur near Portmarnock Bridge and at Portmarnock Point, with narrow strips along other parts of the estuary. Species such as Glasswort (*Salicornia* spp.), Sea-purslane (*Halimione portulacoides*), Sea Plantain (*Plantago maritima*) and Sea Rush (*Juncus maritimus*) are found here. Portmarnock Spit formerly had a well-developed sand dune system but this has been largely replaced by golf courses and is mostly excluded from the site. A few dune hills are still intact at Portmarnock Point, and there are small dune hills east of Cush Point and below the Claremont Hotel. These are mostly dominated by Marram (*Ammophila arenaria*), though Lyme-grass (*Leymus arenarius*) is also found.

The site includes a brackish marsh along the Mayne River. Soils here have a high organic content and are poorly drained, and some pools occur. Rushes (*Juncus* spp.) and salt tolerant species such as Common Scurvygrass (*Cochleria officinalis*) and Greater Sea-spurrey (*Spergularia media*) are typical of this area. Knotted Hedge-parsley (*Torilis nodosa*), a scarce plant in eastern Ireland, has been recorded here, along with Brackish Water-crowfoot (*Ranunculus baudotti*), a species of brackish pools and ditches which has declined in most places due to habitat loss.

Two plant species, legally protected under the Flora (Protection) Order, 1999, occur in the Mayne marsh: Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*).

Baldoyle Bay is an important bird site for wintering waterfowl and the inner part of the estuary is a Special Protection Area under the EU Birds Directive as well as being a Statutory Nature Reserve. Internationally important numbers of Pale-bellied Brent Geese (418) and nationally important numbers of two Annex I Birds Directive species - Golden Plover (1,900) and Bar-tailed Godwit (283) - have been recorded. Four other species also reached nationally important numbers: Shelduck (147), Pintail (26), Grey Plover (148) and Ringed Plover (218) - all figures are average peaks for four winters 1994/95 to 1997/1998. Breeding wetland birds at the site include Shelduck, Mallard and Ringed Plover. Small numbers of Little Tern, a species listed on Annex I of the EU Birds Directive, have bred on a few occasions at Portmarnock Point but not since 1991.

Because the area surrounding Baldoyle Bay is densely populated, the main threats to the site include visitor pressure, disturbance to wildfowl and dumping. In particular, the dumping of spoil onto the foreshore presents a threat to the value of the site.

Baldoyle Bay is a fine example of an estuarine system. It contains four habitats listed on Annex I of the EU Habitats Directive and has two legally protected plant species. The site is also an important bird area and part of it is a Special Protection Area under the EU Birds Directive, as well as being a Statutory Nature Reserve. It supports internationally important numbers of Brent Geese and nationally important numbers of six other species including two Annex I Birds Directive species.

SITE SYNOPSIS

SITE NAME: BALDOYLE BAY SPA

SITE CODE: 004016

Baldoyle Bay extends from just below Portmarnock village to the west pier at Howth, Co. Dublin. It is a tidal estuarine bay protected from the open sea by a large sand-dune system. Two small rivers, the Mayne and the Sluice, flow into the inner part of the estuary.

Large areas of intertidal flats are exposed at low tide. These are mostly sands but grade to muds in the inner sheltered parts of the estuary. Extensive areas of Common Cord-grass (*Spartina anglica*) occur in the inner estuary. Both the Narrow-leaved Eelgrass (*Zostera angustifolia*) and the Dwarf Eelgrass (*Z. noltii*) are also found here. During summer, the sandflats of the sheltered areas are covered by mats of green algae (*Enteromorpha* spp. and *Ulva lactuca*). The sediments have a typical macrofauna, with Lugworm (*Arenicola marina*) dominating the sandy flats. The tubeworm *Lanice conchilega* is present in high densities at the low tide mark and the small gastropod Laver Spire-shell (*Hydrobia ulvae*) occurs in the muddy areas, along with the crustacean *Corophium volutator*. Areas of saltmarsh occur near Portmarnock Bridge and at Portmarnock Point, with narrow strips along other parts of the estuary. Species such as Glasswort (*Salicornia* spp.), Sea-purslane (*Halimione portulacoides*), Sea Plantain (*Plantago maritima*) and Sea Rush (*Juncus maritimus*) are found here.

Baldoyle Bay is of high ornithological importance for wintering waterfowl, providing good quality feeding areas and roost sites for an excellent diversity of waterfowl species. It supports an internationally important population of Pale-bellied Brent Geese (726), and has a further seven species with nationally important populations (all figures are average peaks for the five winters 1995/96 to 1999/2000): Great Crested Grebe (42), Shelduck (147), Pintail (22), Ringed Plover (221), Golden Plover (1810), Grey Plover (200) and Bar-tailed Godwit (353). The occurrence of Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. Other species which occur in significant numbers include Teal (124), Mallard (48), Common Scoter (61), Oystercatcher (531), Lapwing (480), Knot (115), Dunlin (879), Black-tailed Godwit (72), Curlew (96), Redshank (224), Greenshank (11) and Turnstone (43).

Regular breeding birds include Shelduck, Mallard and Ringed Plover. In autumn, passage migrants such as Curlew Sandpiper, Spotted Redshank and Green Sandpiper are regular in small numbers.

Baldoyle Bay SPA is of high conservation importance, with an internationally important population of Brent Geese and nationally important populations of a further seven species, including two which are listed on Annex I of the E.U. Birds Directive. The inner estuarine section is a Statutory Nature Reserve and is also designated as a wetland of international importance under the Ramsar Convention. The site is a

candidate Special Area of Conservation under the E.U. Habitats Directive. The main threat to the birds is disturbance as it is located in a densely populated area.

27.2.2003

SITE SYNOPSIS

SITE NAME: BALLYMAN GLEN

SITE CODE: 000713

Ballyman Glen is situated approximately 3 km north of Enniskerry. It is orientated in an east-west direction with a stream running through the centre. The glen is bounded mostly by steeply sloping pasture with Gorse (*Ulex europaeus*) and areas of wood and scrub.

This site is a candidate SAC selected for alkaline fen and petrifying springs, both habitats listed on Annex I of the EU Habitats Directive.

The glen contains a small strip of fen, which runs along the county boundary and extends into County Dublin. This fen is very alkaline and is associated with petrifying spring/seepage areas that have given rise to thick deposits of marl. The vegetation of the main part of the fen is dominated by Greater Tussock-sedge (*Carex paniculata*), Tall Fescue (*Festuca arundinacea*), Butterworts (*Pinguicula vulgaris* and *P. lusitanica*), Black Bog-rush (*Schoenus nigricans*) and Broad-leaved Cottongrass (*Eriophorum latifolium*). The site is particularly notable for its orchids, which includes Early Marsh-orchid (*Dactylorhiza incarnata*), Narrow-leaved Marsh-orchid (*D. traunsteineri*) and Marsh Helleborine (*Epipactis palustris*). In addition, twenty species of sedge have been recorded in the area, including the scarce Long-stalked Yellow-sedge (*Carex lepidocarpa*). The fen area is being invaded by Downy Birch (*Betula pubescens*). Associated with the fen, and also with the woodland elsewhere in the site, are petrifying springs. These lime-encrusted seepage areas are rich in bryophytes including such diagnostic species as Great Horsetail (*Equisetum telmateia*), *Cratoneuron commutatum* and *C. filicinum*.

Wet woodland and scrub occur along the margins of the stream for most of the length of the glen, extending outwards in areas to create inaccessible and species-rich patches of woodland. The canopy is dominated by Alder (*Alnus glutinosa*), Willow (*Salix* spp.) and Ash (*Fraxinus excelsior*). The woodland has a dense shrub layer which includes Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaeus*), and a diverse ground flora with Marsh Hawks-beard (*Crepis paludosa*), Sanicle (*Sanicula europaea*), Herb-Robert (*Geranium robertianum*), Bugle (*Ajuga reptans*), Horsetails (*Equisetum* spp.), Meadowsweet (*Filipendula ulmaria*) and some sedges (*Carex* spp.). Areas of marsh are found in the wetter areas by the stream, particularly at the western end of the site.

There is an area of broad-leaved woodland on the steeper southern slopes of the glen. Common species occurring here are Ash and Sycamore (*Acer pseudoplatanus*), with Brambles (*Rubus fruticosus* agg.) colonizing the more open areas.

An area of land that slopes towards the fen has been used as a landfill site for domestic refuse. The site is also used as a clay pigeon shoot and shattered clay pigeons

are scattered throughout the area. Fens are rare in Wicklow/Dublin and this is one of only two sites in Wicklow for the Narrow-leaved Marsh-orchid. The fen vegetation is well developed, with an unusually large number of sedge species present. The presence of alkaline fen and of petrifying spring/seepage areas on the site is particularly notable, as these habitats are listed, the latter with priority status, on Annex I of the EU Habitats Directive.

SITE SYNOPSIS

SITE NAME: BRAY HEAD

SITE CODE: 000714

This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. Bedrock geology is Cambrian quartzites and shales (with mudstones and greywackes). Bray Head consists of a plateau of high ground, with five prominent quartzite knolls and has a maximum height of 241 m. The more exposed higher ground has a covering of shallow acidic soils, with protruding bedrock and scree. Elsewhere, deeper soils are formed by drift deposits, calcareous in character.

Heath, a habitat listed on Annex I of the EU Habitats Directive, is the principal habitat over much of the Head. The vegetation of the upper plateau area is dominated by dwarf shrubs, mainly Ling (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Gorse (*Ulex europaeus* and *U. gallii*). Broom (*Cytisus scoparius*) also occurs and associated with the gorse and broom is the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*). In the areas where the shrubs are less dense Tormentil (*Potentilla erecta*), Milkwort (*Polygala vulgaris*), Heath Bedstraw (*Galium saxatile*) and a variety of grasses (e.g. *Aira praecox*, *Agrostis tenuis*, *Deschampsia flexuosa*) are present. Where rock outcrops occur species such as English Stonecrop (*Sedum anglicum*) and Sheep's-bit Scabious (*Jasione montana*) are found. Bracken (*Pteridium aquifolium*) is dominant in some areas.

The heath communities which occur on the dry slopes above the sea-cliffs, especially those south-facing, are more open in character and dominated by grasses rather than dwarf shrubs. The annual plant communities which develop here are very typical of those found only on sites in south-eastern Ireland. Common species include Wood Sage (*Teucrium scordonia*), clovers (*Trifolium dubium*, *T. campestre*), Scarlet Pimpernel (*Anagallis arvensis*) and Field Madder (*Sherardia arvensis*). An uncommon annual species which can appear abundantly in the heath after a fire event is Yellow Fumitory (*Corydalis claviculata*). Some rare plants are found in this habitat, notably Bird's-foot (*Ornithopus perpusillus*) and Spring Vetch (*Vicia lathyroides*), both Red Data Book species.

Calcareous dry grassland, typically species-rich, occurs on deposits of glacial till. The primary grass species are Quaking Grass (*Briza media*), Smooth Meadow-grass (*Poa pratensis*) and Red Fescue (*Festuca rubra*). Typical calcicole herbs include Pale Flax (*Linum bienne*), Salad Burnet (*Sanguisorba minor*), Burnet-saxifrage (*Pimpinella saxifrage*), Carline Thistle (*Carlina vulgaris*) and Kidney Vetch (*Anthyllis vulneraria*). Orchids are a feature of this habitat, with five species known from the area - Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted Orchid (*Dactylorhiza fuchsii*), Common Twayblade (*Listera ovata*), Fragrant Orchid (*Gymnadenia conopsea*) and Bee Orchid (*Ophrys apifera*). Bloody Crane's-bill

(*Geranium sanguineum*) was refound recently in this community at Bray Head - this is a typical species of the Burren and is very rare in eastern Ireland.

Rocky sea cliffs, another Annex I habitat, form most of the seaward boundary at this site and extend for approximately 2 km. Steep clay cliffs extend southwards for a further 1 km, with a small area of clay cliff also at the northernmost part of site. The rocky cliffs are divided by a railway track built in the 1800s. The lower cliffs are fairly steep in places but above the track they are less steep and often support heath or dry grassland vegetation. In parts the cliffs are up to 60 m in height. Typical species of the more exposed rock areas are Common Scurvy-grass (*Cochlearia officinalis*), Rock Spurrey (*Spergularia rupicola*), Thrift (*Armeria maritima*), Sea Campion (*Silene maritima*), and Sea Samphire (*Crithmum maritimum*). On some sections of the cliff face, the locally scarce Tree Mallow (*Lavatera arborea*) is found. Species of the upper cliff flora include Kidney Vetch (*Anthyllis vulneraria*) and Red Fescue. A widespread species found from the mid to upper zones of the cliff face is Ivy (*Hedera helix*). Associated with the Ivy is the scarce *Rubia peregrina*. The clay cliffs in the southern part of the site are steep and unstable and have little vegetation.

A stand of mostly native woodland occurs in the northern part of the site. This is a fairly pure Sessile Oak (*Quercus petraea*) dominated woodland, with some Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*). Understorey trees which occur are Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). The wood is on shallow drift and the ground flora often has species more associated with heath than woodlands. Other habitats which are found at this site include bedrock shore, a sandy/shingle beach and an area of shallow marine water.

Bray Head has an important seabird colony. A census in 1999 gave the following populations: Fulmar (55 pairs), Shag (8 pairs), Kittiwake (781+ pairs), Guillemots (286 individuals), Razorbills (191 individuals) and Black Guillemots (123 individuals). A few pairs of gulls also breed. Both the Kittiwake and Black Guillemot populations are of national importance.

Peregrine Falcon, an Annex I species of the EU Birds Directive, breeds, as well as Raven and Kestrel. Characteristic bird species of the heath areas are Stonechat, Whitethroat, Linnet and Skylark.

The heath and grassland habitats at this site are threatened by reclamation for agriculture and also by frequent burning. The site is a popular recreational area and is especially used by walkers.

Bray Head is of high conservation importance as it has good examples of two habitats (sea cliffs and dry heath) listed on Annex I of the EU Habitats Directive. It also supports a number of rare plant species and has ornithological importance.

22.10.1999

SITE SYNOPSIS

SITE NAME: BROADMEADOW/SWORDS ESTUARY SPA

SITE CODE: 004025

This site is situated in north Co. Dublin, between the towns of Malahide and Swords. It is the estuary of the River Broadmeadow, a substantial river which drains a mainly agricultural, though increasingly urbanised, catchment. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "The Island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats exposed. The site extends eastwards to the rocky shore at Robswalls.

Substantial stands of eelgrass (both *Zostera noltii* and *Z. angustifolia*) occur in the sheltered part of the outer estuary, along with Tasselweed (*Ruppia maritima*). Green algae, mostly *Enteromorpha* spp. and *Ulva lactuca*, are frequent on the sheltered flats. Common Cord-grass (*Spartina anglica*) is well established in the outer estuary and also in the innermost part of the site. The intertidal flats support a typical macro-invertebrate fauna, with polychaete worms (*Arenicola marina* and *Hediste diversicolor*), bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*, the small gastropod *Hydrobia ulvae* and the crustacean *Corophium volutator*.

Salt marshes, which provide important roosts during high tide, occur in parts of the outer estuary and in the extreme inner part of the inner estuary. These are characterised by such species as Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*).

This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has an internationally important population of Brent Goose (956) or 4.8% of the national total (figures given here and below are average maximum counts for the five winters 1995/96-1999/00) and nationally important populations of a further 12 species as follows: Shelduck (439), Pintail (58), Goldeneye (215), Red-breasted Merganser (105), Oystercatcher (1,493), Golden Plover (1,843), Grey Plover (201), Knot (915), Dunlin (1,594), Black-tailed Godwit (409), Redshank (581) and Greenshank (38). A range of other species occur in numbers of regional importance, including Great Crested Grebe, Mute Swan, Pochard, Ringed Plover, Lapwing, Bar-tailed Godwit, Curlew and Turnstone. The high numbers of diving ducks reflects the lagoon-type nature of the inner estuary, and this is one of the few sites in eastern Ireland where substantial numbers of Goldeneye can be found.

The estuary also attracts on a regular basis migrant wader species such as Ruff, Curlew Sandpiper, Spotted Redshank, Green Sandpiper and Little Stint. These occur mainly in autumn, though occasionally in spring and winter.

Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of Malahide Island. Grey Herons breed nearby and feed regularly within the site.

The inner part of the estuary is heavily used for water sports, which causes disturbance to the bird populations. A section of the outer estuary has recently been in-filled for a marina and housing development.

Broadmeadow/Swords Estuary SPA is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The lagoonal nature of the inner estuary is of particular value as it increases the diversity of birds which occur. The site is of high conservation importance, with an internationally important population of Brent Goose and nationally important populations of a further 12 species. Three of the species which occur regularly (Golden Plover, Bar-tailed Godwit and Ruff) are listed on Annex I of the E.U. Birds Directive.

SITE SYNOPSIS

SITE NAME: CARRIGGOWER BOG

SITE CODE: 000716

Carriggower Bog is situated on Calary plateau at the eastern edge of the Wicklow Mountains,. The site is an area of wet bog and poor fen, flanked by the Vartry River on the south-western side.

This site is a candidate SAC selected for transition mire, a habitat listed on Annex I of the EU Habitats Directive.

The bog was exploited for peat extraction until 100 years ago and the peat cuttings are now flooded. The remaining bog vegetation is characterised by bog moss hummocks. Several species of *Sphagnum* are found including *Sphagnum recurvum*. On top of the hummocks Heather (*Calluna vulgaris*) and Cross-leaved Heath (*Erica tetralix*) are dominant. Between the hummocks, in the wet areas, Bog Asphodel (*Narthecium ossifragum*), Bogbean (*Menyanthes trifoliata*) and Common Cottongrass (*Eriophorum angustifolium*) are common, while Purple Moor-grass (*Molinia caerulea*) is locally abundant.

Birch (*Betula pubescens*) and Willow (*Salix* spp.) dominate an area of scrub at the centre of the site.

Very wet areas of transition mire occur on the south-western side of the site. The whole area is quaking and is characterised by a mosaic of sedges, grasses and rushes. Bottle Sedge (*Carex rostrata*) is the most abundant sedge, but others include White Sedge (*Carex curta*), Star Sedge (*Carex echinata*) and Carnation Sedge (*Carex panicea*). Purple Moor-grass and Sharp-flowered Rush (*Juncus acutiflorus*) are also present.

Towards the northern side of the site there are rock outcrops of quartzite which form low knolls. This area is partly covered by heath vegetation, dominated by Gorse (*Ulex europaeus*), Bell Heather (*Erica cinerea*) and Heather, all of which are growing over a grassy sward grazed by sheep. The main grasses are Sweet Vernal-grass (*Anthoxanthum odoratum*), Yorkshire-fog (*Holcus lanatus*), Creeping Soft-grass (*Holcus mollis*) and Bent Grass (*Agrostis* spp.)

The mosaic of transition bog habitats supports a wide range of poor fen/bogland invertebrates, including a suite of wetland species of international importance (most of the Order Diptera).

Carriggower Bog is a notable site for wintering Snipe (117 – mean winter count 1996/97 to 2000/01) and Jack Snipe (16 – mean winter count 1996/97 to 2000/01). These numbers are probably of national importance and the site has consistently held

the highest national count for Jack Snipe in recent years. The very wet bog is prime habitat for both these species.

This site is of conservation importance because it shows a good transition between fen and bog vegetation (with the fen being rapidly colonised by characteristic bog species). The area holds a rich and varied flora and it provides a habitat for some rare invertebrates; Carrigower Bog is the last remaining site in Wicklow from which some of these remaining invertebrates are recorded.

SITE SYNOPSIS

SITE NAME: GLEN OF THE DOWNS

SITE CODE: 000719

This site is a semi-natural Oak wood situated within an impressive glacial overflow channel. It is located on the Dublin-Wexford road about 7 km south of Bray, Co. Wicklow. The underlying rock is mostly quartzite and it outcrops in a few places. The soil is a sandy loam, Brown Earth to Brown Podzolic, and is very dry over much of the site. Most of the site has been a Nature Reserve since 1980.

Much of the site comprises Sessile Oak (*Quercus petraea*) woodland referable to the Blechno-Quercetum petraeae association. Sessile Oak is especially dominant on the mid to upper slopes. The quality of the Oak-dominated areas is variable - the association is well developed and especially pure on the western side, while in some places it occurs as coppice scrub. The shrub layer is sparse but Holly (*Ilex aquilinum*) is locally common. On the ground, Great Wood-rush (*Luzula sylvatica*) forms a dense carpet over much of the area, with other species such as Bilberry (*Vaccinium myrtillus*), Heather (*Calluna vulgaris*) and Wood Sage (*Teucrium scorodonia*) occurring occasionally. Brambles (*Rubus fruticosus* agg.) and ferns such as Soft Shield-fern (*Polystichum setiferum*) are abundant in places, especially on the south-western slopes.

The site includes some areas of mixed woodland, in which Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Scot's Pine (*Pinus sylvestris*) and other exotics occur. Bryophytes are notably scarce within the valley and may reflect the dryness of the site, however, some rare species have been recorded.

A narrow band of alluvium associated with a small stream occurs on the valley floor. There, the woodland is dominated by Ash (*Fraxinus excelsior*) and Hazel (*Corylus avellana*), with a species-rich herb layer that includes Ramsons (*Allium ursinum*), Dog Violet (*Viola riviniana*) and Bluebells (*Hyacinthoides non-scripta*).

A breeding bird census carried out in 1990 recorded a total of 21 species holding territory. Wren, Robin, Blue Tit, Chaffinch and Great Tit were the most abundant species. Blackcap and Jay also breed, and the rare Wood Warbler has been recorded. Grey Wagtail breeds along the stream.

The site is notable for the presence of the rare bryophytes, *Cephaloziella turneri*, *Pterigynandrum filiforme* and *Plagiothecium curvifolium*, the last named in its only Irish site, as well as for several rare or scarce Myxomycete fungi, namely *Echinostelium colliculosum*, *Licea marginata*, *L. perexigua*, *Perichaena vermicularis*, *Comatricha ellae* (only known Irish site), *Diderma chondrioderma* and *Didymium crustaceum*.

Glen of the Downs is also notable for some rare invertebrates, including *Mycetobia obscura* (Diptera) which is found in only one other locality in Britain and Ireland. The glacial overflow channel is the largest example of such a feature in the country.

Although exploited heavily in the past, this woodland is well developed, rich in species and one of high conservation significance. The site supports Oak woodland of a type that is listed on Annex II of the EU Habitats Directive.

SITE SYNOPSIS

SITE NAME: GLENASMOLE VALLEY

SITE CODE: 001209

Glenasmole Valley in south Co. Dublin lies on the edge of the Wicklow uplands, approximately 5 km from Tallaght. The River Dodder flows through the valley and has been impounded here to form two reservoirs which supply water to south Dublin.

The non-calcareous bedrock of the Glenasmole Valley has been overlain by deep drift deposits which now line the valley sides. They are partly covered by scrub and woodland, and on the less precipitous parts, by a herb-rich grassland. There is much seepage through the deposits, which brings to the surface water rich in bases, which induces local patches of calcareous fen and, in places, petrifying springs, a priority habitat listed on Annex I of the EU Habitats Directive.

Examples of calcareous fen and flush areas occur between the two reservoirs, where sedges (*Carex flacca* and *Carex panicea*) are joined by such species as Grass-of-parnassus (*Parnassia palustris*), Few-flowered Spike-rush (*Eleocharis quinqueflora*), Zig-zag clover (*Trifolium medium*) and the scarce Fen Bedstraw (*Galium uliginosum*).

Orchid-rich grassland occurs in the drier parts of this site and in places grades into *Molinia* meadow, both of these habitats are listed on Annex I of the EU Habitats Directive. Species recorded in these habitats include Frog Orchid (*Coeloglossum viride*), Northern Marsh-orchid (*Dactylorhiza purpurella*), Fragrant Orchid (*Gymnadenia conopsea*), Marsh Helleborine (*Epipactis palustris*), Early-purple Orchid (*Orchis mascula*) and Greater Butterfly Orchid (*Platanthera chlorantha*). Two Red Data Book species have also been found here, Green-winged Orchid (*Orchis morio*) and Small-white Orchid (*Pseudorchis albida*). The sward includes Sweet Vernal-grass (*Anthoxanthum odoratum*), Creeping Bent (*Agrostis stolonifera*) and Crested Dog's-tail (*Cynosurus cristatus*). Other species which occur are Common Bird's-foot-trefoil (*Lotus corniculatus*), Kidney Vetch (*Anthyllis vulneraria*), Common Restharrow (*Ononis repens*), Yellow-wort (*Blackstonia perfoliata*) and Autumn Gentian (*Gentianella amarella*).

Woodland occurs in patches around the site. On the east side of the valley, below the northern lake, a Hazel (*Corylus avellana*) wood has developed on the unstable calcareous slopes and includes Ash (*Fraxinus excelsior*), Downy Birch (*Betula pubescens*), Goat Willow (*Salix caprea*) and (Irish) Whitebeam (*Sorbus hibernica*). Spring Wood-rush (*Luzula pilosa*), Wood Speedwell (*Veronica montana*) and Brambles (*Rubus fruticosus* agg.) are included in the ground flora.

Wet semi-natural broad-leaved woodland is also found around the reservoirs and includes Alder (*Alnus glutinosa*) and Willow (*Salix* spp.) with Yellow Iris (*Iris pseudacorus*), Horsetail (*Equisetum* spp.), Brambles and localised patches of Japanese Knotweed (*Reynoutria japonica*), an introduced species.

The lake shore vegetation is not well developed, which is typical of a reservoir. There are occasional patches of Canary-grass (*Phalaris arundinacea*) and Purple-loosestrife (*Lythrum salicaria*), which are more extensive around the western shore of the northern lake, along with Common Marsh-bedstraw (*Galium palustre*) and Water Mint (*Mentha aquatica*). Other vegetation includes Shoreweed (*Littorella uniflora*) and the scarce Water Sedge (*Carex aquatilis*).

As well as the Green-winged Orchid and Small-white Orchid, two other threatened species which are listed in the Irish Red Data Book also occur in the site, Yellow Archangel (*Lamiastrum galeobdolon*) and Yellow Bird's-nest (*Monotropa hypopitys*).

The site provides excellent habitat for bat species, with at least four species recorded: Pipistrelle, Leisler's, Daubenton's and Brown Long-eared Bat. Otter occurs along the river and reservoirs. These habitats also support Kingfisher, an Annex I species under the EU Birds Directive.

Glenasmole Valley contains a high diversity of habitats and plant communities, including three habitats listed on Annex I of the EU Habitats Directive. The presence of four Red Data Book plant species further enhances the value of the site as does the presence of populations of several mammal and bird species of conservation interest.

SITE SYNOPSIS

SITE NAME: HOWTH HEAD COAST SPA

SITE CODE: 004113

Howth Head is a rocky headland situated on the northern side of Dublin Bay. The peninsula is composed of Cambrian rock of the Bray Group, the most conspicuous component being quartzite. The site comprises the sea cliffs extending from just east of the Nose of Howth to the tip of the Bailey Lighthouse peninsula. The marine area to a distance of 500 m from the cliff base, where seabirds socialise and feed, is included within the site.

The cliffs vary from between about 60 m and 90 m in height, and in places comprise fairly sheer, exposed rock face. Here plants such as Rock Sea-spurrey (*Spergularia rupicola*), Navelwort (*Umbilicus rupestris*), Rock Samphire (*Crithmum maritimum*), English Stonecrop (*Sedum anglicum*) and Biting Stonecrop (*Sedum acre*) are found, along with a good diversity of lichen species. Where the gradient allows, shallow glacial drift supports a typical maritime flora, with such conspicuous species as Thrift (*Armeria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), Common Scurvygrass (*Cochlearia officinalis*), Sea Plantain (*Plantago maritima*), Sea Mayweed (*Matricaria maritima*) and Sea Beet (*Beta vulgaris*). Spring Squill (*Scilla verna*), Bloody Crane's-bill (*Geranium sanguineum*), Sea Stork's-bill (*Erodium maritimum*) and Golden-samphire (*Inula crithmoides*) are notable species of the cliff flora.

Howth Head has important colonies of breeding seabirds. A census in 1999 recorded the following numbers: Fulmar 33 pairs, Shag 12 pairs, Herring Gull 17 pairs, Great Black-backed Gull 5 pairs, Kittiwake 2,329 pairs, Guillemot 995 individuals, and Razorbill 416 individuals. In addition, 39 individual Black Guillemot were counted within the SPA in May 1998. The populations of Kittiwake, Razorbill and Black Guillemot are of national importance, while the Guillemot and Fulmar populations are of regional importance. The cliffs also support a breeding pair of Peregrine Falcons, a species listed on Annex I of the EU Birds Directive.

The seabird colony at Howth Head has been monitored at intervals since the Operation Seafarer project in 1969/70. The Kittiwake, Guillemot and Razorbill populations have increased in recent years. The seabirds within the site are not under significant threat at present.

This site is of high ornithological importance, with four seabird species having populations of national importance. It is also a traditional nesting site for Peregrine Falcon. The site is easily accessible and has important amenity and educational value due to its proximity to Dublin City.

10.11.2003

SITE SYNOPSIS

SITE NAME: HOWTH HEAD

SITE CODE: 000202

Howth Head is a rocky headland situated on the northern side of Dublin Bay. The peninsula is composed of Cambrian slates and quartzites, joined to the mainland by a post glacial raised beach. Limestone occurs on the north-west side while glacial drift is deposited against the cliffs in places. Howth Head contains sea cliffs and dry heaths, two habitats listed on Annex I of the EU Habitats Directive.

A mosaic of heathland vegetation occurs on the slopes above the sea cliffs and in the area of the summit. This is dominated by Western Gorse (*Ulex gallii*), Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and localised patches of Bracken (*Pteridium aquilinum*). In more open areas species such as English Stonecrop (*Sedum anglicum*), Wood Sage (*Teucrium scorodonia*) and Navelwort (*Umbilicus rupestris*) occur, along with some areas of bare rock.

The heath merges into dry grassland in places, with Bent Grasses (*Agrostis* spp.), Red Fescue (*Festuca rubra*), Cock's-foot (*Dactylis glomerata*), Yorkshire-fog (*Holcus lanatus*), Sweet Vernal-grass (*Anthoxanthum odoratum*), Lady's Bedstraw (*Galium verum*), Ribwort Plantain (*Plantago lanceolata*) and Yellow-wort (*Blackstonia perfoliata*). In the summit area there are a few wet flushes and small bogs, with typical bog species such as Bog Asphodel (*Narthecium ossifragum*) and Sundew (*Drosera* spp.). Patches of scrub, mostly Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Willow (*Salix* spp.) and Downy Birch (*Betula pubescens*), occur in places.

The maritime flora is of particular interest as a number of scarce and local plants have been recorded, including Golden-samphire (*Inula crithmoides*), Sea Wormwood (*Artemisia maritima*), Grass-leaved Orache (*Atriplex littoralis*), Frosted Orache (*Atriplex laciniata*), Sea Spleenwort (*Asplenium marinum*), Bloody Crane's-bill (*Geranium sanguineum*), Spring Squill (*Scilla verna*), Sea Stork's-bill (*Erodium maritimum*) and three Clover species: Knotted Clover (*Trifolium striatum*), Bird's-foot Clover (*T. ornithopodioides*) and Western Clover (*T. occidentalis*).

Rock outcrops which are important for lichens are distributed widely around Howth Head. The richest area for lichens appears to be around Balscadden quarries. In addition, the Earlscliffe area is of national importance for lichens and is the type locality for the black, yellow and grey lichen zonation.

A number of Red Data Book plant species, which are legally protected under the Flora Protection Order, have been recorded at this site - Green-winged Orchid (*Orchis morio*), Bird's-foot (*Ornithopus perpusillus*), Hairy Violet (*Viola hirta*), Rough Poppy (*Papaver hybridum*), Pennyroyal (*Mentha pulegium*), Heath Cudweed (*Omalotheca sylvatica*) and Betony (*Stachys officinalis*).

Curved Hard-grass (*Parapholis incurva*), a species which had not previously been recognized as occurring in Ireland, was found at Red Rock in 1979.

The site is of national importance for breeding seabirds. A census in 1985-87 recorded the following numbers: Fulmar (105 pairs), Shags (25 pairs), Herring Gulls (70 pairs), Kittiwake (c.1,700 pairs), Guillemot (585 birds), Razorbill (280 birds). In 1990, 21 pairs of Black Guillemot were counted.

A number of rare invertebrates have been recorded from the site: the insect *Phaonia exoleta* (Order Diptera) occurs in the woods at the back of Deerpark and has not been seen anywhere else in Ireland, while the ground beetle *Trechus rubens* (Order Coleoptera) is found on storm beaches on the eastern cliffs. A hoverfly, known from only a few Irish locations, *Sphaerophoria batava* (Order Diptera) is present in the heathland habitat within the site.

The main landuse within the area is recreation, mostly walking and horse-riding, and this has led to some erosion within the site. Fires also pose a danger to the site. There may also be a threat in some areas from further housing development.

Howth Head displays a fine range of natural habitats, including two Annex I habitats, within surprisingly close proximity to Dublin city. The site is also of scientific importance for its seabird colonies, invertebrates and lichens. It also supports populations of at least two legally protected plant species and several other scarce plants.

SITE SYNOPSIS

SITE NAME: IRELAND'S EYE

SITE CODE: 002193

Ireland's Eye is located about 1.5 km north of Howth in Co. Dublin. It is a cambrian island with quartzite which forms spectacular cliffs on the north-east side. Elsewhere much of the area is covered by drift. There is a Martello tower at the west end of the island and an ancient ruined church in the middle.

The drift soils support a plant community of Bracken (*Pteridium aquilinum*) and various grasses, especially Red Fescue (*Festuca rubra*), along with Bluebells (*Hyacinthoides non-scripta*), Common Dog-violet (*Viola riviniana*) and Pennywort (*Umbilicus rupestris*). The thinner soils have some interesting species, including Spring Squill (*Scilla verna*), Knotted Clover (*Trifolium striatum*) and Field Mouse-ear (*Cerastium arvense*). Bloody Cranesbill (*Geranium sanguineum*) has also been recorded from here.

The cliff maritime flora includes Rock Spurrey (*Spergularia rupicola*), Sea Stork's-bill (*Erodium maritimum*), Rock Samphire (*Crithmum maritimum*), Golden Samphire (*Inula crithmoides*), Sea Lavender (*Limonium binervosum*), Meadow Rue (*Thalictrum minor*), Portland Spurge (*Euphorbia portlandica*) and Tree Mallow (*Lavatera arborea*).

A small area of shingle vegetation occurs above the sandy beach at Carrigeen Bay on the western side of the island. This habitat is listed on Annex I of the EU Habitats Directive. Species such as Curled Dock (*Rumex crispus*), Silverweed (*Potentilla anserina*) and Spear-leaved Orache (*Atriplex prostrata*) occur, while the rare Sea Kale (*Crambe maritima*), a very characteristic species of this habitat, has been known from this site since 1894 and was recorded as recently as 1981. Sea Kale is listed as threatened in the Irish Red Data Book. Also occurring on the sandy/shingle beach is the Red Data Book species Henbane (*Hyoscyamus niger*).

Ireland's Eye is of national importance for breeding seabirds. In 1999 the following were counted: Fulmar 70 pairs; Cormorant 306 pairs; Shag 32 pairs; Lesser Black-backed Gull 1 pair; Herring Gull c.250 pairs; Great Black-backed Gull c.100 pairs; Kittiwake 941 pairs; Guillemot 2191 individuals; Razorbill 522 individuals. A Gannet colony was established on the stack at the east end of the island in the late 1980s, and in 1999 142 pairs bred. Puffin was formerly common, but nowadays not more than 20 individuals occur. Black Guillemot also breeds, with 15 individuals recorded in 1998. Several pairs each of Oystercatcher and Ringed Plover breed, while the island is a traditional site for Peregrine Falcon.

In winter small numbers of Greylag and Pale bellied Brent Geese graze on the island.

This uninhabited marine island has a well developed maritime flora, with two habitats (sea cliffs and shingle) listed on Annex II of the EU Habitats Directive, and nationally important seabird colonies. Owing to its easy access and proximity to Dublin it has great educational and amenity value.

25.9.2000

SITE SYNOPSIS

SITE NAME: IRELAND'S EYE SPA

SITE CODE: 004117

Ireland's Eye is an uninhabited island located about 1.5 km north of Howth in Co. Dublin. The island has an area of c.24 ha above the high tide mark. The underlying geology is Cambrian greywackes and quartzites. These rocks form impressive near-vertical cliffs, reaching 69 m, along the northern and eastern sides of the island, with scattered exposures elsewhere on the island and especially in the high northern half. A tall stack, which is completely cut off from the main island at mid to high tide, occurs at the eastern side of the cliffs. A sandy beach, backed by low sand hills, occurs at Carrigeen Bay on the western shore, while a shingle beach extends from Carrigeen to Thulla Rocks. Elsewhere the island is covered by glacial drift. A low-lying, sparsely vegetated islet, known as Thulla, occurs a little to the south of the island, and an extensive area of bedrock shore (heavily covered by brown seaweeds) is exposed at low tide between Thulla and the main island. There are no watercourses or springs on the island, though two small rainwater ponds form during winter in the north-west and north-east sectors. A substantial area of the sea to the north and east of the island, where seabirds socialise and feed, is included in the site.

The drift soils support a plant community of Bracken (*Pteridium aquilinum*) and various grasses, especially Red Fescue (*Festuca rubra*), along with Bluebells (*Hyacinthoides non-scripta*), Common Dog-violet (*Viola riviniana*) and Pennywort (*Umbilicus rupestris*). The localised Spring Squill (*Scilla verna*) is a feature of the flora. The cliff maritime flora includes Rock Spurrey (*Spergularia rupicola*), Sea Stork's-bill (*Erodium maritimum*), Rock Samphire (*Crithmum maritimum*), Golden Samphire (*Inula crithmoides*) and Sea Lavender (*Limonium binervosum*). The small area of shingle vegetation supports two Red Data Book plant species, Sea Kale (*Crambe maritima*) and Henbane (*Hyoscyamus niger*). The seabird populations exercise a strong influence on the vegetation over much of the island and in places only those plants which can survive liberal spraying with guano manage to survive. Hogweed (*Heracleum sphondylium*), Nettles (*Urtica dioica*) and Slender Thistle (*Carduus tenuiflorus*) are common in such areas.

Ireland's Eye has important populations of breeding seabirds. In 1999 the following were counted: Fulmar 70 pairs; Gannet 142 pairs, Cormorant 306 pairs; Shag 32 pairs, Lesser Black-backed Gull 1 pair; Herring Gull c.250 pairs; Great Black-backed Gull c.100 pairs; Kittiwake 941 pairs; Guillemot 2,191 individuals; Razorbill 522 individuals. In 2001 the following were counted: Gannet 202 pairs; Cormorant 438 pairs; Shag 39 pairs; Great Black-backed Gull 110 pairs; Kittiwake 1024 pairs; Guillemot 2948 individuals; Razorbill 686+ individuals. Puffin was formerly common, but nowadays not more than 20 individuals occur. Black Guillemot also breeds, with 15 individuals recorded in 1998. Manx Shearwater has bred in the past. The Gannet, Cormorant, Herring Gull, Great Black-backed Gull, Kittiwake, Guillemot and Razorbill populations are of national importance. When the Cormorant

population is considered as part of a larger grouping with the colonies on nearby Lambay and St. Patrick's Island, this population is of international importance. The Gannet colony is of particular note as it is one of five in the country and the only one on the east coast. It is also notable that it has only been established as recently as the late 1980s.

Several pairs each of Shelduck, Oystercatcher and Ringed Plover breed, while the island is a traditional site for Peregrine Falcon, a species listed on Annex I of the EU Birds Directive. In winter small numbers of Greylag and Pale-bellied Brent Geese graze on the island and it is used as a roost site by gulls and some waders.

Ireland's Eye is now one of the best monitored sites in the country, with the breeding seabirds having been systematically censused using standard methods almost annually since 1990 (and also in 1986). Prior to that, census data are available for 1969/70 from the Operation Seafarer project. The present status of most of the breeding seabirds on Ireland's Eye appears favourable. The principal direct threat to the nesting birds is potential disturbance from visitors to the island. While the present level of disturbance does not appear to be having adverse impacts on the majority of the breeding birds (most of which are on relatively inaccessible cliffs), regulation and management of visitors to the island may be necessary in the future. Brown rats are long established on the island but their recent status is not well known. It is likely, however, that the presence of rats may be a factor in keeping the Puffin population at a low level.

This relatively small island is of high ornithological importance, with seven seabird species having populations of national importance. The regular presence of a breeding pair of Peregrine Falcon is also of note.

SITE SYNOPSIS

SITE NAME: KNOCKSINK WOOD

SITE CODE: 000725

Knocksink Wood is situated in the valley of the Glencullen River north-west of Enniskerry. The fast-flowing Glencullen River winds its way over granite boulders along the valley floor. The steep sides of the valley are mostly covered with calcareous drift.

Some of the slopes are dominated by Sessile Oak (*Quercus petraea*) with a sparse shrub layer of Holly (*Ilex aquilinum*) and Hazel (*Corylus avellana*), while on the ground there is a carpet of Great Wood-rush (*Luzula sylvatica*). Other areas are characterised by mixed woodland, with Oak, Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*) and the occasional conifer occurring. The ground flora includes Ivy (*Hedera helix*) and Brambles (*Rubus fruticosus* agg.), and often luxuriant ferns, such as Hart's Tongue (*Phyllitis scolopendrium*), Soft Shield-fern (*Polystichium setiferum*), and mosses. Lichens occur abundantly on some trees.

A notable feature of the slopes are the frequent and extensive springs and seepage areas within the woodland. These petrifying springs are listed as a priority habitat on Annex I of the EU Habitats Directive. Associated with the springs and the river are stands of wet alluvial forest, also a habitat listed with priority status on Annex I of the EU Habitats Directive. The wet woodland is dominated by Ash and Alder (*Alnus* spp.) and is assigned to the group *Carici remotae-Fraxinetum*. Other species which occur include Willow (*Salix* spp.), Birch (*Betula pubescens*) and Hazel. Islands in the river and open gravelly areas provide further habitat diversity.

A number of scarce or rare plants occur within the site including Blue Fleabane (*Erigeron acer*), Ivy-leaved Bellflower (*Wahlenbergia hederacea*) and Yellow Archangel (*Lamium galeobdolon*).

This site has one of the most diverse woodland invertebrate faunas in Ireland, incorporating wet woodland organisms threatened internationally within the EU. Vertebrates noted in the vicinity, either by tracks, sett or sight, include Red Squirrel, Badger, Rabbit and Deer. The woodland supports large populations of birds, including many common passerines (Robin, Blackbird, Song Thrush, Wren, Chaffinch) and crows, such as Rook, Hooded Crow, Magpie, Jackdaw and Raven. A Buzzard has been noted in the area and Dipper are occasionally seen in the river.

The importance of this site lies in the diversity of woodland habitats which occur. The presence of rare or threatened plants and invertebrates adds to the interest. Much of this site has been designated a Statutory Nature Reserve and there is presently an educational centre within the site.

7.8.2003

SITE SYNOPSIS

SITE NAME : MALAHIDE ESTUARY

SITE CODE : 000205

Malahide Estuary is situated immediately north of Malahide and east of Swords. It is the estuary of the River Broadmeadow. The site is divided by a railway viaduct built in the 1800s.

The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as "the island". The outer estuary drains almost completely at low tide, exposing sand and mud flats. There is a large bed of Eelgrass (*Zostera noltii* and *Z. angustifolium*) in the north section of the outer estuary, along with Tassel Weed (*Ruppia maritima*) and extensive mats of green algae (*Enteromorpha* spp., *Ulva lactuca*). Cordgrass (*Spartina anglica*) is also widespread in this sheltered part of the estuary.

The dune spit has a well developed outer dune ridge dominated by Marram Grass (*Ammophila arenaria*). The dry areas of the stabilised dunes have a dense covering of Burnet Rose (*Rosa pimpinellifolia*), Red Fescue (*Festuca rubra*) and species such as Yellow Wort (*Blackstonia perfoliata*), Field Gentian (*Gentianella amarella*), Hound's Tongue (*Cynoglossum officinale*), Carlina Thistle (*Carlina vulgaris*) and Pyramidal Orchid (*Anacamptis pyramidalis*). Much of the interior of the spit is taken up by a golf course. The inner stony shore has frequent Sea-holly (*Eryngium maritimum*). Well-developed saltmarshes occur at the tip of the spit. Atlantic salt meadow is the principle type and is characterised by species such as Sea Purslane (*Halimolobos portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*). Elsewhere in the outer estuary, a small area of Mediterranean salt meadow occurs which is characterised by the presence of Sea Rush (*Juncus maritimus*). Below the salt marshes there are good examples of pioneering Glasswort swards and other annual species, typified by *Salicornia dolichostachya* and Annual Sea-blite (*Suaeda maritima*).

The inner estuary does not drain at low tide apart from the extreme inner part. Here, patches of saltmarsh and salt meadows occur, with Sea Aster, Sea Plantain (*Plantago maritima*) and Sea Clubrush (*Scirpus maritimus*). Tassel Weed (*Ruppia maritima*) occurs in one of the channels.

The site includes a fine area of rocky shore south-east of Malahide and extending towards Portmarnock. This represents the only continuous section through the fossiliferous Lower Carboniferous rocks in the Dublin Basin, and is the type locality for several species of fossil coral.

The estuary is an important wintering bird site and holds an internationally important population of Brent Geese and nationally important populations of a further 15 species. Average maximum counts during the 1995/96-1997/98 period were Brent

Geese 1217; Great Crested Grebe 52; Mute Swan 106; Shelduck 471; Pochard 200; Goldeneye 333; Red-breasted Merganser 116; Oystercatcher 1228; Golden Plover 2123; Grey Plover 190; Redshank 454; Wigeon 50; Teal 78; Ringed Plover 106; Knot 858; Dunlin 1474; Greenshank 38; Pintail 53; Black-tailed Godwit 345; Bar-tailed Godwit 99. The high numbers of diving birds reflects the lagoon-type nature of the inner estuary.

The estuary also attracts migrant species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of the island and the habitat remains suitable for these birds.

The inner part of the estuary is heavily used for water sports. A section of the outer estuary has recently been infilled for a marina and housing development.

This site is a fine example of an estuarine system with all the main habitats represented. The site is important ornithologically, with a population of Brent Geese of international significance.

SITE SYNOPSIS

SITE NAME: NORTH BULL ISLAND SPA

SITE CODE: 004006

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (*Ammophila arenaria*) is dominant on the outer dune ridges. Species of the fixed dunes include Wild Pansy (*Viola tricolor*), Kidney Vetch (*Anthyllis vulneraria*), Bird's-foot Trefoil (*Lotus corniculatus*), Pyramidal Orchid (*Anacamptis pyramidalis*) and, in places, the scarce Bee Orchid (*Ophrys apifera*). A feature of the dune system is a large dune slack with a rich flora, usually referred to as the 'Alder Marsh' because of the presence of Alder (*Alnus glutinosa*) trees. The water table is very near the surface and is only slightly brackish. Sea Rush (*Juncus maritimus*) is the dominant species, with Meadowsweet (*Filipendula ulmaria*) and Devil's-bit Scabious (*Succisa pratensis*) being frequent. The orchid flora is notably diverse in this area.

Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. On the lower marsh, Glasswort (*Salicornia europaea*), Common Saltmarsh-grass (*Puccinellia maritima*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*) are the main species. Higher up in the middle marsh Sea Plantain (*Plantago maritima*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*) and Thrift (*Armeria maritima*) appear. Above the mark of the normal high tide, species such as Common Scurvygrass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*) are found, while on the extreme upper marsh, Sea Rush and Saltmarsh Rush (*Juncus gerardi*) are dominant.

The island shelters two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. Tasselweed (*Ruppia maritima*) and small amounts of Eelgrass (*Zostera* spp.) are found in the lagoons. Common Cord-grass (*Spartina anglica*) occurs in places. Green algal mats (*Enteromorpha* spp., *Ulva lactuca*) are a feature of the flats during summer. These sediments have a rich macro-invertebrate fauna, with high densities of Lugworm (*Arenicola marina*) and Ragworm (*Hediste diversicolor*). Mussels (*Mytilus edulis*) occur in places, along with bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*. The small gastropod *Hydrobia ulvae*

occurs in high densities in places, while the crustaceans *Corophium volutator* and *Carcinus maenas* are common. The sediments on the seaward side of North Bull Island are mostly sands and support species such as Lugworm and the Sand Mason (*Lanice conchilega*). The site includes a substantial area of the shallow marine bay waters.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. It also qualifies for international importance as the numbers of three species exceed the international threshold – Light-bellied Brent Goose (1,548), Black-tailed Godwit (367) and Bar-tailed Godwit (1,529) (all waterfowl figures given are average maxima for the five winters 1995/96 to 1999/00). The site is the top site in the country for both of these species. A further 14 species have populations of national importance – Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Ringed Plover (139), Golden Plover (1,741), Grey Plover (517), Knot (2,623), Sanderling (141), Dunlin (3,926), Curlew (937), Redshank (1,431) and Turnstone (157). The populations of Pintail and Knot are of particular note as they comprise more than 10% of the respective national totals. Species such as Grey Heron, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser and Greenshank are regular in winter in numbers of regional or local importance. Gulls are a feature of the site during winter, especially Black-headed Gull (2,196). Common Gull (332) and Herring Gull (331) also occur here. While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.

The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.

The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit, Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The site has five Red Data Book vascular plant species, four rare bryophyte species, and is nationally important for three insect species. The rare liverwort, *Petalophyllum*

ralfsii, was first recorded from the North Bull Island in 1874 and its presence here has recently been re-confirmed. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. A well-known population of Irish Hare is resident on the island

The main landuses of this site are amenity activities and nature conservation. The North Bull Island is one of the main recreational beaches in Co. Dublin and is used throughout the year. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrounding intertidal flats. North Bull Island is also a Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site. Much of the SPA is also a candidate Special Area of Conservation. The site is used regularly for educational purposes and there is a manned interpretative centre on the island.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl.

SITE SYNOPSIS

SITE NAME : NORTH DUBLIN BAY

SITE CODE : 000206

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head.

The North Bull Island is the focal point of this site. The island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (*Ammophila arenaria*) is dominant on the outer dune ridges, with Lyme Grass (*Leymus arenarius*) and Sea Couchgrass (*Elymus farctus*) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (*Viola tricolor*), Kidney Vetch (*Anthyllis vulneraria*), Bird's-foot Trefoil (*Lotus corniculatus*), Rest Harrow (*Ononis repens*), Yellow Rattle (*Rhinanthus minor*) and Pyramidal Orchid (*Anacamptis pyramidalis*). In these grassy areas and slacks, the scarce Bee Orchid (*Ophrys apifera*) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (*Alnus* spp). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (*Juncus maritimus*) is the dominant species, with Meadow Sweet (*Filipendula ulmaria*) and Devil's-bit (*Succisa pratensis*) being frequent. The orchid flora is notable and includes Marsh Helleborine (*Epipactis palustris*), Common Twayblade (*Listera ovata*), Autumn Lady's-tresses (*Spiranthes spiralis*) and Marsh orchids (*Dactylorhiza* spp.)

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (*Salicornia europaea*), Saltmarsh Grass (*Puccinellia maritima*), Annual Sea-blite (*Suaeda maritima*) and Greater Sea-spurrey (*Spergularia media*) are the main species. Higher up in the middle marsh Sea Plantain (*Plantago maritima*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritima*) and Sea Pink (*Armeria maritima*) appear. Above the mark of the normal high tide, species such as Scurvy Grass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*) are found, while on the extreme upper marsh, Sea Rushes (*Juncus maritimus* and *J. gerardii*) are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "*Salicornia* flat", which is dominated by *Salicornia dolichostachya*, a pioneer Glasswort species, and covers about 25 ha. Tassel Weed (*Ruppia maritima*) occurs in this area, along with some Eelgrass (*Zostera angustifolia*). Eelgrass (*Z. noltii*) also occurs in Sutton Creek. Cordgrass (*Spartina anglica*) occurs in places but its growth is controlled by management. Green algal mats (*Enteromorpha* spp., *Ulva lactuca*) cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms (*Arenicola marina*) in parts of the north lagoon. Mussels (*Mytilus edulis*) occur in places, along with bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*. The small gastropod *Hydrobia ulvae* occurs in high densities in places, while the crustaceans *Corophium volutator* and *Carcinus maenas* are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three Rare plant species legally protected under the Flora Protection Order 1987 have been recorded on the North Bull Island. These are Lesser Centaury (*Centaureum pulchellum*), Hemp Nettle (*Galeopsis angustifolia*) and Meadow Saxifrage (*Saxifraga granulata*). Two further species listed as threatened in the Red Data Book, Wild Sage (*Salvia verbenaca*) and Spring Vetch (*Vicia lathyroides*), have also been recorded. A rare liverwort, *Petalophyllum ralfsii*, was first recorded from the North Bull Island in 1874 and has recently been confirmed as being still present there. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Geese 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations - Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling, Dunlin).

The tip of the North Bull Island is a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (Orders Diptera, Hymenoptera, Hemiptera).

The main landuses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the E.U. Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. The holds good examples of ten habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

SITE SYNOPSIS

SITE NAME: POULAPHOUCA RESERVOIR SPA

SITE CODE: 004063

Poulaphouca Reservoir SPA, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid-east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The exit is into the River Liffey gorge at the western end. Underlying the reservoir are sands and gravels deposited during the last glaciation. The shores of the lake are mostly sandy. When water levels are low the exposed lake muds are colonised by an ephemeral flora of annual plant species. Wet grassland areas occur in sheltered bays around the lake but especially in the northern part. Reed Canary-grass (*Phalaris arundinacea*) is the main grass species present, but other plant species characteristic of wet grasslands occur, including Creeping Bent (*Agrostis stolonifera*), Meadowsweet (*Filipendula ulmaria*), Yellow Iris (*Iris pseudacorus*) and Water Mint (*Mentha aquatica*). Sedges (*Carex* spp.) are locally common, while Rusty Willow (*Salix cinerea* subsp. *oleifolia*) scrub is often found associated with the wet grassland. In some places the water washes against grassy banks which are generally less than a metre high, and in a few places there are steep sand and clay cliffs, up to 15 m high - these are remnants of the old River Liffey channel. In many places the banks are actively eroding, and a strip of conifers has been planted around much of the perimeter of the reservoir in an attempt to stabilize the banks.

Poulaphouca Reservoir is of international importance for its Greylag Goose population, which is one of the largest in the country. The site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the site. An average peak of 1,058 individuals occurred during the five seasons 1995/96 to 1999/00. A range of other waterfowl species occur in relatively low numbers, including Whooper Swan (34), Wigeon (262), Teal (136), Mallard (283), Goldeneye (36), Cormorant (16), Great Crested Grebe (11), Curlew (118) and Mute Swan (17). The site is also used by Grey Heron (12).

The reservoir attracts roosting gulls during winter, most notably a large population of Lesser Black-backed Gull (1,116), which in Ireland is rare in winter away from the south coast. Black-headed Gull (1,245) and Common Gull (229) also occur.

Breeding birds at the site include Great Crested Grebe (several pairs), which is localised in its distribution in eastern Ireland, as well as Snipe and Lapwing.

The principal interest of the site is the Greylag Goose population, which is of international importance. A range of other wildfowl species also occurs, including

Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull.

SITE SYNOPSIS

SITE NAME: RED BOG, KILDARE

SITE CODE: 000397

Red Bog, Kildare is located 3 km north of the village of Blessington in east Co. Kildare, close to the boundary with Co. Wicklow. It comprises a wetland complex of lake, fen and bog situated in a hollow between ridges of glacially-deposited material and underlain by rocks of Ordovician age.

The site is a candidate SAC selected for transition mire, a habitat listed on Annex I of the E.U. Habitats Directive.

The shores of the lake are muddy and support such species as Bog Stitchwort (*Stellaria alsine*), Brooklime (*Veronica beccabunga*) and Soft Rush (*Juncus effusus*). Fringing the lakeshore is a narrow zone with emergent Soft Rush, Water-plantain (*Alisma plantago-aquatica*), Bottle Sedge (*Carex rostrata*), as well as the moss *Climacium dendroides*. In places, particularly at either end of the lake and along its south-eastern side, this zone grades into extensive areas of quaking scraw vegetation of dense Bogbean (*Menyanthes trifoliata*) and Marsh Cinquefoil (*Potentilla palustris*), accompanied by such species as Sharp-flowered Rush (*Juncus acutiflorus*), Cuckooflower (*Cardamine pratensis*), Marsh Speedwell (*Veronica scutellata*), Common Marsh-bedstraw (*Galium palustre*), Water Horsetail (*Equisetum fluviatile*), Common Sedge (*Carex nigra*), Common Spotted-orchid (*Dactylorhiza fuchsii*) and the mosses *Rhytidiadelphus squarrosus* and *Sphagnum squarrosum*. Bulrush (*Typha latifolia*) and areas of Willow scrub (*Salix* spp.) also occur in association with this vegetation.

The deeper water supports submerged aquatic plants such as Water-starwort (*Callitriche*) and Water-crowfoot (*Ranunculus* spp.), while in sheltered areas floating plants including Duckweed (*Lemna minor*) and the liverwort *Riccia fluitans* are found.

At the north-east end of the site bog vegetation has developed, with Ling Heather (*Calluna vulgaris*) and Hare's-tail Cottongrass (*Eriophorum vaginatum*) being the most frequent species. Other bog plants found here include Bog Asphodel (*Narthecium ossifragum*), Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*), Heath Wood-rush (*Luzula multiflora*), the mosses *Sphagnum palustre*, *S. capillifolium*, *S. subnitens*, *Hypnum cupressiforme*, *Polytrichum commune* and *Dicranum scoparium*, and the lichen *Cladonia portentosa*.

Red Bog is of ornithological significance and breeding birds recorded from the site include Mute Swan, Mallard, Tufted Duck, Coot, Moorhen, Snipe and Black-headed Gull (< 20 pairs).

Gravel extraction, drainage and eutrophication of the wetland from agricultural activities in the surrounding lands all pose a threat to the site.

Red Bog, Kildare is a site of particular conservation significance, supporting as it does, a good example of a transition mire, a habitat that is listed on Annex I of the E.U. Habitats Directive.

SITE SYNOPSIS

SITE CODE: RYE WATER VALLEY/CARTON

SITE CODE: 001398

This site is located between Leixlip and Maynooth. It extends along the Rye Water, a tributary of the R. Liffey.

The Rye Water in Carton Estate is dammed at intervals, creating a series of lakes. Reed Grass (*Glyceria maxima*) is frequent around the lakes, along with Yellow Flag (*Iris pseudacorus*), Reed Canary-grass (*Phalaris arundinacea*), Bulrush (*Typha latifolia*), Water Forget-me-not (*Myosotis scorpioides*), Marsh Marigold (*Caltha palustris*) and Starwort (*Callitriche* spp.). Along the remainder of the site the river has recently been dredged and much of the Reed fringe removed.

To the north-west of Carton Bridge a small clump of Willows (*Salix* spp.), with Dogwood (*Cornus* sp.) some Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*) and Elder (*Sambucus nigra*) occurs. The ground flora found here includes Golden Saxifrage (*Chrysosplenium oppositifolium*), Meadowsweet (*Filipendula ulmaria*), Common Valerian (*Valeriana officinalis*), Wavy Bitter-cress (*Cardamine flexuosa*) and Bittersweet (*Solanum dulcamara*).

The woods on Carton Estate are mostly old demesne woods with both deciduous and coniferous species. Conifers, including some Yew (*Taxus baccata*) are dominant, with Beech (*Fagus sylvatica*), Oak (*Quercus* sp.), Sycamore (*Acer pseudoplatanus*), Ash and Hazel (*Corylus avellana*) also occurring. The ground flora is dominated by Ivy (*Hedera helix*) with such species as Hedge Woundwort (*Stachys sylvatica*), Wood Speedwell (*Veronica montana*), Woodruff (*Galium odoratum*), Wood Avens (*Geum urbanum*), Common Dog- violet (*Viola riviniana*), Wild Angelica (*Angelica sylvestris*), Ramsons (*Allium ursinum*), Ground-ivy (*Glechoma hederacea*) and Ivy Broomrape (*Orobancha hederaceae*) also occurring.

Hairy St. John's-wort (*Hypericum hirsutum*), a species legally protected under the Flora Protection Order (1987), occurs in Carton Estate; there is an old record from the estate for the similarly protected, Hairy Violet (*Viola hirta*), but this has not been recorded from here in recent years. Another species listed in the Red Data Book, Green Figwort (*Scrophularia umbrosa*), occurs on the site in several locations by the Rye Water. The woods at Carton Demesne are the site of a rare Myxomycete fungus, *Diderma deplanatum*.

Within the woods, Blackcap, Woodcock and Long-eared Owl have been recorded. Little Grebe, Coot, Moorhen, Tufted Duck, Teal and Kingfisher, the latter a species listed on Annex I of the EU Birds Directive, occur on and about the lake.

The marsh, mineral spring and seepage area found at Louisa Bridge supports a good diversity of plant species, including Stoneworts, Arrowgrass (*Triglochin palustris*),

Purple Moor-grass (*Molinea caerulea*), Sedges (*Carex* spp.), Common Butterwort (*Pinguicula vulgaris*), Marsh Lousewort (*Pedicularis palustris*), Grass-of-parnassus (*Parnassia palustris*) and Cuckooflower (*Cardamine pratensis*). The mineral spring found at the site is of a type considered to be rare in Europe and is a habitat listed on Annex I of the EU Habitats Directive. The Red Data Book species Blue Fleabane (*Erigeron acer*) is found growing on a wall at Louisa Bridge. The Rye Water is a spawning ground for Trout and Salmon, and the rare, White-clawed Crayfish (*Austropotamobius pallipes*) has been recorded at Leixlip. The latter two species are listed on Annex II of the EU Habitats Directive. The semi-aquatic snails *Vertigo angustior* and *V. moulinsiana* occur in marsh vegetation near Louisa Bridge; both are rare in Ireland and Europe and are listed on Annex II of the EU Habitats Directive. The scarce Dragonfly, *Orthetrum coerulescens*, has been recorded at Louisa Bridge.

The main importance of the site lies in the presence of several rare and threatened plant and animal species, and of a rare habitat, thermal, mineral, petrifying spring. The woods found on Carton Estate and their birdlife are of additional interest.

South Dublin Bay and River Tolka Estuary SPA 4024

This site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the estuary of the River Tolka to the north of the River Liffey. A portion of the shallow marine waters of the bay is also included. The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex. An internationally important population of Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the eelgrass bed at Merrion. The site supports nationally important numbers of a further six species:

Oystercatcher (1,145), Ringed Plover (161), Knot (548), Sanderling (321), Dunlin (1,923) and Bar-tailed Godwit (766). Other species which occur in smaller numbers include Great Crested Grebe (21), Grey Plover (45), Curlew (127), Redshank (260) and Turnstone (52). The main threat to this site is further reclamation for industrial and/or infra-structural purposes. The intertidal areas receive water that is somewhat polluted though there are no apparent impacts on the associated flora and fauna. Owing to its location in Dublin Bay, pollution such as oil spillages from Dublin Port and shipping is a threat. Commercial bait digging may be a problem - this causes disturbance to wintering birds. Disturbance to birds is also caused by walkers and dogs. Sandymount Strand/Tolka Estuary SPA is of high ornithological importance, being of international importance for Brent Goose and of national importance for six waterfowl species. As an autumn tern roost, it is also classified as of international importance. All of the tern species using the site are listed on Annex I of the E.U. Birds Directive, as are Bartailed Godwit and Mediterranean Gull

SITE SYNOPSIS

SITE NAME: SOUTH DUBLIN BAY

SITE CODE: 000210

This site lies south of the River Liffey and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats, a habitat listed on Annex I of the E.U. Habitats Directive. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion gates. The main channel which drains the area is Cockle Lake.

There is a bed of Eelgrass (*Zostera noltii*) below Merrion Gates which is the largest stand on the east coast. Green algae (*Enteromorpha* spp. and *Ulva lactuca*) are distributed throughout the area at a low density. Furoid algae occur on the rocky shore in the Maretimo to Dún Laoghaire area. Species include *Fucus spiralis*, *F. vesiculosus*, *F. serratus*, *Ascophyllum nodosum* and *Pelvetia canaliculata*.

Lugworm (*Arenicola marina*) and Cockles (*Cerastoderma edule*) and other annelids and bivalves are frequent throughout the site. The small gastropod *Hydrobia ulvae* occurs on the muddy sands off Merrion Gates.

South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215), Ringed Plover (120), Sanderling (344) and Dunlin (2628), Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Geese regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the EU Birds Directive, also occur.

Large numbers of gulls roost in South Dublin Bay, e.g. 4,500 Black-headed Gulls in February 1990; 500 Common Gulls in February 1991. It is also an important tern roost in the autumn, regularly holding 2000-3000 terns including Roseate Terns, a species listed on Annex I of the E.U. Birds Directive. South Dublin Bay is largely protected as a Special Protection Area.

At low tide the inner parts of the south bay are used for amenity purposes. Bait-digging is a regular activity on the sandy flats. At high tide some areas have wind-surfing and jet-skiing.

This site is a fine example of a coastal system with extensive sand and mudflats, a habitat listed on Annex I of the E.U. Habitats Directive. South Dublin Bay is also an internationally important bird site.

25.2.2000

SITE SYNOPSIS

SITE NAME: WICKLOW MOUNTAINS

SITE CODE: 002122

This site is a complex of upland areas in Counties Wicklow and Dublin, flanked by Blessington Reservoir to the west and Vartry Reservoir in the east, Cruagh Mt. in the north and Lybagh Mt. in the south. Most of the site is over 300m, with much ground over 600m and the highest peak of Lugnaquilla at 925m.

The Wicklow Uplands comprise a core of granites flanked by Ordovician schists, mudstones and volcanics. The form of the Wicklow Glens is due to glacial erosion.

The Wicklow Mountains are drained by several major rivers including the Dargle, Liffey, Dodder, Slaney and Avonmore. The river water in the mountain areas is often peaty, especially during floods.

The topography is typical of a mountain chain, showing the effects of more than one cycle of erosion. The massive granite has weathered characteristically into broad domes. Most of the western part of the site consists of an elevated moorland, covered by peat. The surrounding schists have assumed more diverse outlines, forming prominent peaks and rocky foothills with deep glens. The dominant topographical features are the products of glaciation. High corrie lakes, deep valleys and moraines are common features of this area.

The substrate over much of the area is peat, usually less than 2m deep. Poor mineral soil covers the slopes and rock outcrops are frequent

The vegetation over most of the site is a mosaic of heath, blanket bog and upland grassland (mostly on peaty soil, though some on mineral soil), with stands of dense Bracken (*Pteridium aquilinum*) and small woodlands mainly along the rivers. Mountain loughs and corrie lakes are scattered throughout the site. The site supports many habitats that are listed on Annex I of the E.U. Habitats Directive.

The two dominant vegetation communities in the area are heath and blanket bog. Heath vegetation, with both wet and dry heath well represented, occurs in association with blanket bog, upland acid grassland and rocky habitats. The wet heath is characterised by species such as Ling (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Cottongrasses (*Eriophorum* spp.), Tormantil (*Potentilla erecta*), Mat-grass (*Nardus stricta*), Bent grasses (*Agrostis* spp.) and bog mosses (*Sphagnum* spp.). In places the wet heath occurs in conjunction with flush communities and streamside vegetation, and here species such as Heath Rush (*Juncus squarrosus*) and *Carex* spp. are found. Dry heath at this site is confined to shallow peaty soils on steep slopes where drainage is better and particularly in sheltered conditions. It is characterised by species such as Ling, Gorse (*Ulex* spp.), Bell Heather (*Erica cinerea*), Bilberry (*Vaccinium myrtillus*), Purple Moor-grass (*Molinia caerulea*) and lichens (*Cladonia*

spp.). In places the heath grades into upland grassland on mineral soil, some examples of which correspond to the E.U. Habitats Directive Annex I priority habitat species-rich *Nardus* grassland.

Blanket bog is usually dominated by Cottongrasses, Ling and bog mosses (*Sphagnum* spp.). On steeper slopes there is some flushing and here Purple Moor-grass, Heath Rush, and certain *Sphagnum* species become more common. The Liffey Head blanket bog is among the best of its kind in eastern Ireland, with deep peat formations and an extensive system of dystrophic pools developed among the hummocks and hollows on the bog surface. The vegetation is largely dominated by Ling and Cross-leaved Heath, with Cottongrasses (*Eriophorum vaginatum* and *E. angustifolium*), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Nartheceum ossifragum*). In drier areas, Bilberry and Cowberry (*Vaccinium vitis-idaea*) are common, while the scarce Bog Rosemary (*Andromeda polifolia*) is also found. Blanket bog occurs over extensive areas of deeper peat on the plateau and also on gentle slopes at high altitudes. Peat erosion is frequent on the peaks - this may be a natural process, but is likely to be accelerated by activities such as grazing.

Due to the underlying rock strata, the water of the rivers and streams tends towards acidity. The water is generally oligotrophic and free from enrichment. The lakes within the area range from the high altitude lakes of Lough Firrib and Three Lakes, to the lower pater-noster lakes of Glendalough, Lough Tay and Lough Dan. Spectacular corrie lakes (such as Loughs Bray (Upper and Lower), Ouler, Cleevaun, Arts, Kellys and Nahanagan) exhibit fine sequences of moraine stages. The deep lakes are characteristically species poor, but hold some interesting plants including an unusual form of Quillwort (*Isoetes lacustris* var. *morei*), a Stonewort (*Nitella* sp.) and Floating Bur-reed (*Sparganium angustifolium*). The Red Data Book fish species Arctic Char has been recorded from Lough Dan, but this population may now have died out.

Alpine vegetation occurs on some of the mountain tops, notably in the Lugnaquilla area, and also on exposed cliffs and scree slopes elsewhere in the site. Here alpine heath vegetation is represented with species such as Crowberry (*Empetrum nigrum*), Cowberry, Dwarf Willow (*Salix herbacea*), the grey-green moss *Racomitrium lanuginosum* and scarce species such as Mountain Clubmoss (*Diphasiastrum alpinum*), Firmoss (*Huperzia selago*), and Starry Saxifrage (*Saxifraga stellaris*). Some rare arctic-alpine species have been recorded, including Alpine Lady's-mantle (*Alchemilla alpina*) and Alpine Saw-wort (*Saussurea alpina*).

Small areas of old oakwood (Blechno-Quercetum petraeae type) occur on the slopes of Glendalough and Glenmalur, near L. Tay and L. Dan, with native Sessile Oak (*Quercus petraea*) 100-120 years old. On wetter areas, wet broadleaved semi-natural woodlands occur, which are dominated by Downy Birch (*Betula pubescens*). Mixed woodland with non-native tree species also occurs.

The site supports a range of rare plant species, which are listed in the Irish Red Data Book: Parsley Fern (*Cryptogramma crispa*), Marsh Clubmoss (*Lycopodiella inundata*), Greater Broom-rape (*Orobancha rapum-genistae*), Alpine Lady's-mantle, Alpine Saw-wort, Lanceolate Spleenwort (*Asplenium billotii*), Small White Orchid (*Pseudorchis albida*) and Bog Orchid (*Hammarbya paludosa*). The latter three

species are legally protected under the Flora (Protection) Order, 1999. The rare Myxomycete fungus, *Echinostelium colliculosum*, has been recorded from the Military Road.

Mammals and birds which occur are typical of the uplands. Deer are abundant, mainly hybrids between Red and Sika Deer. Other mammals include Hare, Badger and Otter, the latter being a species listed on Annex II of the E.U. Habitats Directive. Pine Marten has recently been confirmed as occurring within the site. Among the birds, Meadow Pipit, Skylark, Raven and Red Grouse are resident throughout the site. Wheatear, Whinchat and the scarce Ring Ouzel are summer visitors. Wood Warbler and Redstarts are rare breeding species of the woodlands. Dipper and Grey Wagtail are typical riparian species. Merlin and Peregrine Falcon, both Annex I species of the EU Birds Directive, breed within the site. Recently, Goosander has become established as a breeding species.

Large areas of the site are owned by NPWS, and managed for nature conservation based on traditional landuses for the uplands. The most common landuse is traditional sheep grazing. Other land uses include turf-cutting, mostly hand-cutting but some machine-cutting occurs. These activities are largely confined to the Military Road, where there is easy access. Large areas which had been previously hand-cut and are now abandoned, are regenerating. In the last 40 years, forestry has become an important landuse in the uplands, and has affected both the wildlife and the hydrology of the area. Amenity use is very high, with Dublin city close to the site.

Wicklow Mountains is important as a complex, extensive upland site. It shows great diversity from a geomorphological and a topographical point of view. The vegetation provides examples of the typical upland habitats with heath, blanket bog and upland grassland covering large, relatively undisturbed areas. In all ten habitats listed on Annex I of the EU Habitats Directive are found within the site. Several rare, protected plant and animal species occur.

12.10.2001

SITE SYNOPSIS

SITE NAME: WICKLOW MOUNTAINS SPA

SITE CODE: 004040

This is an extensive upland site, comprising a substantial part of the Wicklow Mountains. The underlying geology of the site is mainly of Leinster granites, flanked by Ordovician schists, mudstones and volcanics. The area was subject to glaciation and features fine examples of glacial lakes, deep valleys and moraines. Most of site is over 300 m, with much ground being over 600 m; the highest peak is Lugnaquilla (925 m). The substrate over much of site is peat, with poor mineral soil occurring on the slopes and lower ground. Exposed rock and scree are features of the site.

The dominant habitats present are blanket bog, heaths and upland grassland. The bog habitat is usually dominated by Ling (*Calluna vulgaris*), Cross-leaved Heath (*Erica tetralix*), Cottongrasses (*Eriophorum vaginatum* and *E. angustifolium*), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Narthecium ossifragum*). Bog mosses (*Sphagnum* spp.) are well represented. On shallower peats, dry heath is represented by such species as Ling, Gorse (*Ulex* spp.), Bell Heather (*Erica cinerea*), Bilberry (*Vaccinium myrtillus*), Purple Moor-grass (*Molinia caerulea*) and lichens (*Cladonia* spp.). Fine examples of native Oak woodlands are found in the Glendalough area, and include Sessile Oak (*Quercus petraea*) trees of 100-120 years old. Glendalough Lake is a good example of an oligotrophic system.

The site supports good examples of both upland and woodland bird communities. The open peatlands provide excellent foraging habitat for Merlin (5-10 pairs) and Peregrine (c. 10 pairs). The Merlins nest in old crows nests, whilst the Peregrines nest on cliffs and crags. Other birds of the open peatlands and scree slopes include Ring Ouzel, now a very rare bird in Ireland, and Red Grouse. The Wicklow uplands are the only regular location in Ireland where Goosander breeds, with the Glendalough lakes being a regular site. This species was proved to be breeding only as recently as 1994 and it is now well established. Whinchat, a localised species in Ireland, breeds within the site.

The Glendalough Oak woods are a regular location for several rare breeding passerines. Redstart is recorded most years and 1-2 pairs probably breed. Wood Warbler is another annual visitor, with perhaps up to 5 pairs in some years. Recently, Garden Warbler has been recorded, whilst Blackcap has a very strong breeding population.

The site, which is within the Wicklow Mountains National Park, is fragmented into about twenty separate parcels of land. Much of the site is State-owned and managed for nature conservation based on traditional landuses for the uplands. The most common landuse is traditional sheep grazing. Other land uses include turf-cutting, mostly by hand though some machine-cutting also occurs. Grazing by sheep and deer in the woodlands can be damaging as it prevents or reduces regeneration. Dublin City

is close to the site and amenity use is very high; if not properly controlled, recreational activities could cause disturbance to some bird species.

This site is of high ornithological importance as it supports very good examples of upland and woodland bird communities. Several of the species which occur are very rare at a national level. Two species, Ring Ouzel and Red Grouse, are Red-listed and their status is of high conservation concern. Also of note is that Merlin and Peregrine are both listed on Annex I of the E.U. Birds Directive.

Appendix B

Natura 2000 Site Screening Tables

Site Name	Qualifying features		Key Environmental conditions to support site integrity	Possible impacts arising from the Dodder CFRAMP					Measure/Mitigation	
				Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects from other preferred options or other PPPs?		
Wicklow Mountains (IE0002122)	7130	Blanket bog (*active only)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status . Main threats and Impacts: Grazing, Afforestation, Recreational activities, encroachment of scrub, land improvement/reclamation and afforestation	The Natura 2000 site is situated at a much higher altitude than the location of the 5 preferred options that are (at their closest) 9km downstream. Due to bth the high altitude of the site and long distance upstream from the preferred options, there is no potential for effects on the Natura 2000 site as a result in alterations in river level and flow in the flood cells.	0 m ²	None	None	None	None Applicable	
	4010	Northern Atlantic wet heaths with Erica tetralix	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.							
	4030	European dry heaths	To maintain the extent, species richness and biodiversity of the entire site. Main threats and impacts: Agriculture, burning, sand and gravel extraction, urbanization, industrialization, acidification, tropospheric ozone and nitrogen enrichment caused by atmospheric deposition							
	91A0	Old sessile oak woods with Ilex and Blechnum in British Isles	To establish effective liaison and co-operation with landowners, legal users and relevant authorities . Main Threats and Impacts: inappropriate grazing levels and invasive species, clearance for agriculture or felling for timber, Planting of non-native conifers.							
	8220	Siliceous rocky slopes with chasmophytic vegetation	Main Threats and Impacts: Overgrazing, Quarrying, Outdoor Recreation.							
	8210	Calcareous rocky slopes with chasmophytic vegetation	Main Threats and Impacts: Overgrazing, Quarrying, Outdoor Recreation.							
	8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	Main Pressures and threats: Abandonment, overgrazing, burning, outdorr recreation, quarries, communication networks, wind farm developments.							
	4060	Alpine and Boreal heaths								
	3160	Natural dystrophic lakes and ponds								
	3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea								
	6230	Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)	Main Threats and Impacts: Agricultural intensification, Agricultural abandonment and afforestation							
1355	Lutra Lutra									
BALDOYLE BAY also comprises Baldoyle Bay Ramsar Site (IE000199)		Mudflats and sandflats not covered by seawater at low tide. Threats and pressures - Aquaculture, professional fishing, bait digging, removal of fauna, aggregate extraction;(removal of beach material, industrialization, Port/Marina, communications networks, water pollution, reclamation of land, coastal protection works, invasion by a species	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	1140	Salicornia and other annuals colonizing mud and sand								To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.
	1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)								To maintain the extent, species richness and biodiversity of the entire site.
	1410	Mediterranean salt meadows (Juncetalia maritimi)								To establish effective liaison and co-operation with landowners, legal users and relevant authorities.
										Threats - Aquaculture, professional fishing, bait digging, removal of fauna, aggregate extraction;(removal of beach material, industrialization, Port/Marina, communications networks, water pollution, reclamation of land, coastal protection works, invasion by a species, erosion & accretion, grazing, over-grazing, infilling, reclamation, horse-riding, amenity use, camping, tracks and electricity poles
	1320	Spartina swards (Spartinion maritimae)								
	HOWTH HEAD (IE000202)	3150								Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation
91D0		Bog woodland	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.							
4030		Sea cliffs and dry heaths	To maintain the extent, species richness and biodiversity of the entire site.							
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.							
			Threats - Fertilisation, grazing, restructuring land holdings, forestry, leisure fishing, hunting, disposal of household waste, nautical sports, water pollution, drainage and Invasive species, peat cutting, burning, afforestation							
	2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.							

Site Name	Qualifying features		Key Environmental conditions to support site integrity	Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects from other preferred options or other PPPs?	Measure/Mitigation
MALAHIDE ESTUARY (Broadmeadow estuary) also comprises Broadmeadow Ramsar Site (IE000205)	2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	1140	Mudflats and sandflats not covered by seawater at low tide	To maintain the extent, species richness and biodiversity of the entire site.						
	1310	Salicornia and other annuals colonizing mud and sand	To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
	1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	Threats - Walking, horse-riding, non-motorised vehicles, erosion, grazing, undergrazing, invasion by a species, trampling, overuse, camping and caravans, agricultural improvement, stock feeding, overgrazing, motorised vehicles, paths, tracks, cycle routes, golf course, restructuring, sea defence, dispersed habitation, disposal of household waste, sand and gravel extraction, other pollution, sports pitch, urbanisation, burning, routes, autoroutes, fertilisation, pollution, competition						
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)								
1320	<i>Spartina</i> swards (<i>Spartinion maritimae</i>)								
NORTH DUBLIN BAY also comprises North Bull Island Ramsar Site (IE000206)	1140	Mudflats and sandflats not covered by seawater at low tide	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Potential for increased sediment release in to river channel during dredging and construction of walls and embankments in the flood cells. This sediment will be transported within the dodder river channel and out in the estuarine waters of Dublin Bay. Due to the influence of tidal waters in Dublin may it, there is little or no potential for any impacts on the North Dublin Bay Natura 2000 site qualifying interests.	0 m ²	None	None	None	None
	1310	Salicornia and other annuals colonizing mud and sand	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	To maintain the extent, species richness and biodiversity of the entire site.						
	1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
	1210 2110 2120 2130 2190 1320 1395	Annual vegetation of drift lines Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation Humid dune slacks <i>Spartina</i> swards (<i>Spartinion maritimae</i>) <i>Petalophyllum ralfsii</i>	Threats - Walking, horse-riding, non-motorised vehicles, erosion, grazing, undergrazing, invasion by a species, trampling, overuse, camping and caravans, agricultural improvement, stock feeding, overgrazing, motorised vehicles, paths, tracks, cycle routes, golf course, restructuring, sea defence, dispersed habitation, disposal of household waste, sand and gravel extraction, other pollution, sports pitch, urbanisation, burning, routes, autoroutes, fertilisation, pollution, competition						
SOUTH DUBLIN BAY also contains Sandymount Strand/Tolka Estuary Ramsar Site (IE000210)	1140	Mudflats and sandflats not covered by seawater at low tide	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Potential for increased sediment release in to river channel during dredging and construction of walls and embankments in the flood cells. This sediment will be transported within the dodder river channel and out in the estuarine waters of Dublin Bay. Due to the influence of tidal waters in Dublin may it, there is little or no potential for any impacts on the South Dublin Bay Natura 2000 site qualifying interests.	0 m2	None	None	None	None
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
			To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Aquaculture; professional fishing; bait digging; reclamation of land; coastal protection works; invasion by a species						
	7140	Transition mires and quaking bogs	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site					
	3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						

Site Name	Qualifying features		Key Environmental conditions to support site integrity	Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects from other preferred options or other PPPs?	Measure/Mitigation
RED BOG, KILDARE (IE000397)	7110	Active raised bogs	To maintain the extent, species richness and biodiversity of the entire site.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Agriculture & land reclamation; drainage; peat cutting; afforestation; invasive species; eutrophication, fertilisation; overgrazing						
BALLYMAN GLEN (IE000713)	7230	Alkaline fens Petrifying springs with tufa formation (Cratoneurion)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	7220		To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Agriculture & land reclamation; drainage; peat cutting; afforestation; invasive species; fertilisation; overgrazing; pollution;						
BRAY HEAD (IE000714)	1230	Vegetated sea cliffs of the Atlantic and Baltic coasts	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	4030	European dry heaths Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*)important orchid sites)	To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Encroachment; undergrazing; cultivation; fertiliser; abandonment of pastoral systems; extraction of sand and gravel; overgrazing; burning; agricultural improvement; removal of scrub						
CARRIGGOWER BOG (IE000716)	7140	Transition mires and quaking bogs	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	7140		To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Agriculture & land reclamation; drainage; peat cutting; afforestation; invasive species						
GLEN OF THE DOWNS (IE000719)	91A0	Old sessile oak woods with Ilex and Blechnum in British Isles	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	91A0		To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Grazing; invasive species; planting of non-native conifers; felling of native tree species						
KNOCKSINK WOOD (IE000725)	7220	Petrifying springs with tufa formation (Cratoneurion)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities.						
			Threats - Agriculture & land reclamation; drainage; peat cutting; afforestation; invasive species; fertilisation; overgrazing; pollution; felling of native trees species; planting of non-native conifers						

Site Name	Qualifying features		Key Environmental conditions to support site integrity	Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects from other preferred options or other PPPs?	Measure/Mitigation
GLENASMOLE VALLEY (IE001209)	6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(~important orchid sites)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	The Natura 2000 site is situated at a much higher altitude than the location of the 5 preferred options that are (at their closest) 15km downstream. Due to both the high altitude of the site and long distance upstream from the preferred options, there is no potential for effects on the Natura 2000 site as a result in alterations in river level and flow in the flood cells. In addition, the Poulaphouca reservoir is located between the Natura 2000 sites and the flood cells acts as natural storage of water and a buffer from effects in changes in hydrology between the Natura 2000 site and the flood cells.	0 m2	None	None	None	None
	6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
	7220	Petrifying springs with tufa formation (Cratoneurion)	To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities. Threats - Encroachment; undergrazing; cultivation; fertiliser; abandonment of pastoral systems; extraction of sand and gravel; overgrazing; burning; agricultural improvement; removal of scrub						
RYE WATER VALLEY/CARTON (IE001398)	7220	Petrifying springs with tufa formation (Cratoneurion)	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
			To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
			To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities. Threats - Agriculture & land reclamation; drainage; peat cutting; afforestation; invasive species; fertilisation; overgrazing; pollution.						
IRELAND'S EYE (IE002193)	1220	Perennial vegetation of stony banks	To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status.	Natura 2000 site screened out from assessment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	1230	Vegetated sea cliffs of the Atlantic and Baltic coasts	To maintain the Annex II species for which the cSAC has been selected at favourable conservation status.						
		Shingle	To maintain the extent, species richness and biodiversity of the entire site.						
			To establish effective liaison and co-operation with landowners, legal users and relevant authorities. Threats - reclamation of land; drainage; dredging; invasion of species; removal of fauna; coastal protection works; walking, horse-riding & non-motorised vehicles; trampling, overuse; paths, tracks & cycling routes; motorised vehicles; factory; sports pitch; overgrazing; routes/autoroues; pollution; discontinuous urbanisation; burning; competition						

Site Name	Qualifying features	Key Environmental conditions to support site integrity	Possible impacts arising from the RBMP					Measure/Mitigation
			Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects? (from other preferred options or other PPPs)	
Wicklow Mountains SPA (IE004040)	This site is of high ornithological importance as it supports very good examples of upland and woodland bird communities. Several of the species which occur are very rare at a national level. Two species, Ring Ouzel and Red Grouse, are Red-listed and their status is of high conservation concern. Also of note is that Merlin and Peregrine are both listed on Annex I of the E.U. Birds Directive.	<p>To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.</p> <p>Favourable conservation status of a habitat is achieved when - its natural range, and area it covers within that range, is stable or increasing, and - the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and - the conservation status of its typical species is favourable as defined below.</p> <p>The favourable conservation status of a species is achieved when:- population data on the species concerned indicate that it is maintaining itself, and - the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.</p>	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
Baldoyle Bay SPA (IE004016)	It supports an internationally important population of Pale-bellied Brent Geese, and has a further seven species with nationally important populations: Great Crested Grebe, Shelduck, Pintail, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit. Other species which occur in significant numbers include Teal, Mallard, Common Scoter, Oystercatcher, Lapwing, Knot, Dunlin, Black-tailed Godwit, Curlew, Redshank, Greenshank and Turnstone.	<p>To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.</p> <p>Favourable conservation status of a habitat is achieved when - its natural range, and area it covers within that range, is stable or increasing, and - the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and - the conservation status of its typical species is favourable as defined below.</p> <p>The favourable conservation status of a species is achieved when:- population data on the species concerned indicate that it is maintaining itself, and - the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.</p>	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
Broadmeadow/Swords Estuary (IE004025)	It has an internationally important population of Brent Goose or 4.8% of the national total and nationally important populations of a further 12 species as follows: Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Redshank and Greenshank.	<p>To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.</p> <p>Favourable conservation status of a habitat is achieved when - its natural range, and area it covers within that range, is stable or increasing, and - the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and - the conservation status of its typical species is favourable as defined below.</p> <p>The favourable conservation status of a species is achieved when:- population data on the species concerned indicate that it is maintaining itself, and - the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.</p>	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
	This site is of high ornithological importance, with four seabird species having populations of national importance (Kittiwake, Razorbill and Black Guillemot). It is also a traditional nesting site for Peregrine Falcon.	To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.						

Site Name	Qualifying features	Key Environmental conditions to support site integrity	Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects? (from other preferred options or other PPPs)	Measure/Mitigation
Howth Head Coast SPA (IE004113)		Favourable conservation status of a habitat is achieved when · its natural range, and area it covers within that range, is stable or increasing, and · the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and · the conservation status of its typical species is favourable as defined below.	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
		The favourable conservation status of a species is achieved when:· population data on the species concerned indicate that it is maintaining itself, and · the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.						
Ireland's Eye SPA (IE004117)	This relatively small island is of high ornithological importance, with seven seabird species having populations of national importance (Gannet, Cormorant, Herring Gull, Great Black-backed Gull, Kittiwake, Guillemot and Razorbill). The regular presence of a breeding pair of Peregrine Falcon is also of note.	To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
		Favourable conservation status of a habitat is achieved when · its natural range, and area it covers within that range, is stable or increasing, and · the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and · the conservation status of its typical species is favourable as defined below.						
		The favourable conservation status of a species is achieved when:· population data on the species concerned indicate that it is maintaining itself, and · the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.						
North Bull Island SPA (IE004006)	The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. It also qualifies for international importance as the numbers of two species exceed the international threshold – Brent Goose and Bar-tailed Godwit. A further 15 species have populations of national importance – Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Curlew, Redshank and Turnstone.	To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.	Potential for increased sediment release in to river channel during dredging and construction of walls and embankments in the flood cells. This sediment will be transported within the dodder river channel and out in the estuarine waters of Dublin Bay. Due to the influence of tidal waters in Dublin Bay, there is little or no potential for any impacts on the North Dublin Bay Natura 2000 site qualifying interests.	0 m2	None	None	None	None Applicable
		Favourable conservation status of a habitat is achieved when · its natural range, and area it covers within that range, is stable or increasing, and · the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and · the conservation status of its typical species is favourable as defined below.						
		The favourable conservation status of a species is achieved when:· population data on the species concerned indicate that it is maintaining itself, and · the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.						
Poulaphouca Reservoir SPA (IE004063)	The principal interest of the site is the Greylag Goose population, which is of international importance. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull.	To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.	Natura 2000 site screened out from assessment.	0 m2	None	None	None	None Applicable
		Favourable conservation status of a habitat is achieved when · its natural range, and area it covers within that range, is stable or increasing, and · the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and · the conservation status of its typical species is favourable as defined below.						

Site Name	Qualifying features	Key Environmental conditions to support site integrity	Potential During Construction	Area of impact on habitats within the Natura site (m ²)	Predicted Short Term Impact (assuming the successful implementation of mitigation measures)	Predicted Residual Impact (assuming the successful implementation of mitigation measures)	Risk of significant "in combination" effects? (from other preferred options or other PPPs)	Measure/Mitigation
	Black-backed Gull.	The favourable conservation status of a species is achieved when:· population data on the species concerned indicate that it is maintaining itself, and · the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.						
Sandymount Strand/Tolka Estuary (IE004024)	An internationally important population of Brent Goose occurs regularly and newly arrived birds in the autumn feed on the eelgrass bed at Merrion. The site supports nationally important numbers of a further six species: Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin and Bar-tailed Godwit. Other species which occur in smaller numbers include Great Crested Grebe, Grey Plover, Curlew, Redshank and Turnstone.	<div>To maintain the bird species of special conservation interest, for which this SPA has been listed, at favourable conservation status.</div> <div>Favourable conservation status of a habitat is achieved when · its natural range, and area it covers within that range, is stable or increasing, and · the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and · the conservation status of its typical species is favourable as defined below.</div> <div>The favourable conservation status of a species is achieved when:· population data on the species concerned indicate that it is maintaining itself, and · the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.</div>	Potential for increased sediment release in to river channel during dredging and construction of walls and embankments in the flood cells. This sediment will be transported within the dodder river channel and out in the estuarine waters of Dublin Bay. Due to the influence of tidal waters in Dublin Bay, there is little or no potential for any impacts on the North Dublin Bay Natura 2000 site qualifying interests.	0 m2	None	None	None	None Applicable

Appendix C

Other Plans & Programmes Assessed

Relevant plans and programmes assessed to determine cumulative impacts.

Aspect	Relevant Plan/Policy	Objective
Planning and Development	National Development Plan, 2007-2013	The €184 billion National Development Plan 2007-2013 builds on the significant social and economic achievements of the NDP/CSF (2000-2006). Launched in January 2007, and entitled Transforming Ireland - A Better Quality of Life for All, this new seven year plan is another major milestone in building a prosperous Ireland for all its people, characterised by sustainable economic growth, greater social inclusion and balanced regional development.
	National Spatial Strategy, 2002-2020	A coherent national planning framework for Ireland for the next 20 years. The NSS aims to achieve a better balance of social, economic and physical development across Ireland, supported by more effective planning.
	National Strategic Reference Framework, 2007-2013	Sets out policy context within which funding available to Ireland under the EU structural funds may be applied.
	Regional Planning Guidelines for the Greater Dublin Area 2004-2016	The regional planning guidelines give regional effect to the National Spatial Strategy. These guidelines provide the consolidation of development in the Metropolitan Area and articulate the vision and strategy for the region in economic and social terms. The guidelines recommend that all future development of any significant size should be undertaken in the context of Local Area Plans.
	Dublin City Development Plan, 2005-2011	The City Development Plan proposes a sustainable and vibrant city in the context of the strategy for the development of a Greater Dublin'. It promotes the consolidation of the city, maximising efficient use of land and integrating land use and transport.
	South Dublin County Development Plan 2004-2010	The main aim is to provide for the future of well being of the residents and to facilitate the future sustainable development of the county as a vibrant place in which to live and work, visit and enjoy within the strategic framework of the greater Dublin area.
	Dun Laoghaire-Rathdown County Development Plan 2010-2016	To plan for and co-ordinate operate sustainable development in Dun Laoghaire-Rathdown based on high quality residential, working and recreational environments and sustainable transportation patterns. To create a high quality physical environment to meet the growing needs of those living working or visiting the county in a sustainable, inclusive, balanced and integrated way and where communities can thrive in an ecologically, socially and economically sustainable manner.
	Glenasmole/Bohernabreena Housing & Planning Study, 2002	To plan for the sustainable development of the Glenasmole/Bohernabreena area which lies at the foothills of the Dublin Mountains approximately 15km from Dublin city centre and just south of the built up area of Tallaght. It lies in the administrative area of South Dublin County Council. The proximity of the area to the urban fringe has put it under increasing development pressure.
	Ballsbridge Draft Local Area Plan	Draft statement with maps, plans and drawings setting out objectives for the proper planning and sustainable development of the Ballsbridge area.
	Stillorgan Local Area Plan 2007	Plan for the proper planning and sustainable development of the area - Dun Laoghaire-Rathdown County Council.
	Glencullen Local Area Plan 2008	Plan for the proper planning and sustainable development of the area - Dun Laoghaire-Rathdown County Council.
	Enniskerry Local Area Plan, 2002-2008	Plan for the proper planning and sustainable development of the area - Wicklow County Council.
	Tallaght Town Centre Local Area Plan, 2006-2012	Plan for the proper planning and sustainable development of the area - South Dublin County Council.

Aspect	Relevant Plan/Policy	Objective
	Rathmines Local Action Plan 2009	Plan for the proper planning and sustainable development of the area – Dublin City Council.
	A Vision for Dublin Bay	An integrated economic, cultural and social vision for sustainable development – Dublin City Council
	Dublin Docklands Area Master Plan, 2003-2008	Overall strategy for the proper planning and sustainable development of the area – Dublin Docklands Development Authority.
Habitat Management	Management Plan for Wicklow Mountain National Parks 2005-2009	The primary aims of the management plan are to: develop and maintain the highest standards of conservation management and educational provision; facilitate appropriate recreational, community and commercial interests and activities, consistent with the conservation and educational imperative; ensure the orderly implementation of strategies in consultation with local interests and statutory agencies; and, by so doing; ensure that the Park is a protected landscape of the highest international standards for all our visitors, and for the generations to come, in full accordance with the principles of sustainable development.
Water Quality	Eastern River Basin District Management Plan 2009 - 2015 and associated Programmes of Measures	<p>a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;</p> <p>b) promotes sustainable water use based on a long-term protection of available water resources;</p> <p>c) aims at enhanced protection and improvement of the aquatic environment, including through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;</p> <p>d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and</p> <p>e) contributes to mitigating the effects of floods and droughts.</p>