Appendix 5 – Appropriate Assessment (Stage 2)

Introduction

The following is an Appropriate Assessment based on the conclusion of the AA Screening in Appendix 4 of this report, that the proposed development is likely to have a significant effect on 24 no. European Designated sites which contain protected birds, seals, dolphin, otter and habitats including Galway Bay Complex SAC (000268), Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (000190), Inishbofin and Inishshark SAC (000278), Lough Corrib SAC (000297), Slyne Head Islands SAC(000328), Duvillaun Islands (000495), Inishkea Islands SAC (000507), Maumturk Mountains SAC (002008), Connemara Bog Complex SAC (002034), Kilkieran Bay and Islands SAC (002111), Lower River Shannon SAC (002165), Blasket Islands SAC (002172), West Connacht Coast SAC (002998), Donegal Bay (Murvagh) SAC (000133), St. John's Point SAC (000191), Inishmore Island SAC (000213), Killala Bay/ Moy Estuary SAC (000458), Ballysadare Bay SAC (000622), Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625), Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627), Clew Bay SAC (001482), Slyne Head Peninsula SAC (002074), Inner Galway Bay SPA (004031) and Lough Corrib SPA (004042) 'alone' in respect of effects associated with construction, specifically the risk of sedimentation being released into Galway Bay, which is within and hydrologically linked to the European Sites, disturbance on birds and marine mammals during the pre-construction and construction phases and operational impacts in relation to disturbance on bird and mobile marine mammal species within the nearby SACs/ SPAs.

<u>Appropriate Assessment of implications of the proposed development</u>

The following is a summary of the objective scientific assessment of the implications of the project on the qualifying interest features of the European sites using the best scientific knowledge in the field as presented in the original NIS and NIS Addenda/ Errata Documents (2014, 2015, & 2019) and NIS Addendum 2024. All aspects of the project which could result in significant effects are assessed and mitigation measures designed to avoid or reduce any adverse effects are considered and assessed.

I had regard to the following Guidance in my assessment:

- DoEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, National Parks and Wildlife Service.
- EC (2021) Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EC (2021/C 437/01).
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive [92/43/EEC].

The following section provides a summary matrix for the 24 no. European Sites identified, providing details of location of SAC or SPA site in relation to the proposed development site, a description of the European Site from the site synopsis on the NPWS website, identification of the relevant qualifying features that could be impacted from each of the European Sites, the potential impacts on the qualifying interests and whether mitigation measures are required to protect the European Sites.

Summary Matrix for European Sites (Stage 2)
1. AA Summary Matrix for Galway Bay Complex SAC (000268)
Galway Bay Complex SAC (NPWS Site Code: 000268) – proposed development located within the SAC. Galway Bay Complex SAC | National Parks & Wildlife Service **Description of the Site:** According to the Site Synopsis for this SAC, situated on the west coast of Ireland, this site comprises the inner, shallow part of a large bay which is partially sheltered by the Aran Islands. The Burren karstic limestone fringes the southern sides and extends into the sublittoral. West of Galway city the bedrock geology is granite. There are numerous shallow and intertidal inlets on the eastern and southern sides, notably Muckinish, Aughinish and Kinvarra Bays. A number of small islands composed of glacial deposits are located along the eastern side. These include Eddy Island, Deer Island and Tawin Island. A diverse range of marine, coastal and terrestrial habitats, including several listed on Annex I of the E.U. Habitats Directive, occur within the site, making the area of high scientific importance.

Galway Bay South holds a very high number of littoral communities (12). They range from rocky terraces, to sandy beaches with rock or sand dunes behind. The intertidal sediments of Galway Bay support good examples of communities that are moderately exposed to wave action. A well-defined talitrid amphipod zone in the upper shore gives way to an intertidal, mid shore zone with sparse epifauna or infauna. On the lower, flat part of the shore, the tubes of the deposit-feeding terebellid worm, Lanice conchilega, are common on the surface. Nereid and cirratulid polychaete worms (Hediste diversicolor, Arenicola marina), small crustaceans and bivalves (Angulus tenuis, Cerastoderma edule and Macoma balthica) are present. The area has the country's only recorded example of the littoral community characterized by Fucus serratus with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata. This community has very high species richness (85 species), as do the sublittoral fringe communities on the Finavarra reef (88 species). The rare Purple Sea Urchin Paracentrotus lividus and the foliose red alga Phyllophora sicula are present at Finavarra, whereas the red alga Rhodymenia delicatula and the rare brown alga, Ascophyllum nodosum var. mackii, occur in Kinvarra and Muckinish Bays. Sublittorally, the area has a number of distinctive and important communities. Of particular note is that Ireland's only reported piddock (bivalve mollusc) bed thrives in the shallows of Aughinish Bay. The rare sponge, Mycale contarenii, is also found here. There is further interest in an extensive maerl bed of Phymatolithon calcareum which occurs in the strong tidal currents of Muckinish Bay. There is also maerl off Finavarra Point and in Kinvarra Bay (Lithothamnion corallioides, Lithophyllum dentatum and Lithophyllum fasciculatum). An oyster bed in Kinvarra Bay and seagrass (Zostera spp.) beds off Finavarra Point are also important features. Other significant habitats which occur include secondary maerl beds and communities strongly influenced by tidal streams.

Saltmarshes are frequent within this extensive coastal site, with both E.U. Habitats Directive types, 'Atlantic Salt Meadow' and 'Mediterranean Salt Meadow' well represented. Most of the saltmarshes are classified as the bay type, with the substrate being mud or mud/sand. There is one lagoon type and one estuary type. Lagoon saltmarshes are the rarest type found in Ireland. The best examples of saltmarsh are located in inner Galway bay, east of a line running between Galway city and Kinvarra. In this area the coastline is highly indented, thus providing the sheltered conditions necessary for extensive saltmarsh development. Common saltmarsh species include Thrift (Armeria maritima), Red Fescue (Festuca rubra), Common Scurvygrass (Cochlearia officinalis), Lax-flowered Sea-lavender (Limonium humile), Common Saltmarsh-grass (Puccinellia maritima), Saltmarsh Rush (Juncus gerardi) and Sea Rush (Juncus maritimus). On the lower levels of the saltmarshes and within pans there occurs Glasswort (Salicornia europaea agg.). A noteworthy feature of the saltmarsh habitat within this site is the presence of dwarfed brown seaweeds in the vegetation. These are also known as "turf fucoids" and typical species include Fucus spp., Ascophyllum nodosum and Pelvetia canaliculata. A number of locally rare vascular plant species also grow in saltmarsh areas within the site. These include Reflexed Saltmarsh-grass (Puccinellia distans) and Sea-purslane (Halimione portulacoides), which are both relatively rare in the western half of the country.

Shingle and stony beaches can be found throughout the site, with the best examples along the more exposed shores to the south and west of Galway city and to the north and east of Finavarra, Co. Clare. In general, these shingle shorelines are sparsely vegetated and frequently occur interspersed with areas of sandy beach and/or bedrock shore. The associated flora is dominated by plant species of frequently disturbed maritime habitats. To the south and west of Galway city, typical plants include Curled Dock (Rumex crispus), Common Couch (Elymus repens), Sea Sandwort (Honkenya peploides), Sea Beet (Beta vulgaris subsp. maritima), Sea Mayweed (Matricaria maritima), Silverweed (Potentilla anserina) and Oraches (Atriplex spp.). Two rare plant species are associated with the habitat: Henbane (Hyoscyamus niger), a threatened species listed in the Irish Red Data Book, grows on shingle beach to the south of Lough Atalia; there are also old records for the threatened plant species Seakale (Crambe maritima).

Soft coastal cliffs reaching heights in excess of 10m occur at Rusheen. These support coastal grassland with very sparse vegetation cover. Species recorded include Sea Plantain (Plantago maritima), Creeping Bent (Agrostis stolonifera), False Oat-grass (Arrhenatherum elatius), Cock's Foot (Dactylis glomerata), Red Fescue, Common Bird's foot-trefoil (Lotus corniculatus), and the lichens Ramalina sp. and Xanthoria parietina. They are considered highly representative of the rarer soft type of sea cliffs in Ireland.

An excellent range of lagoons of different types, sizes and salinities occurs within the site. This habitat is given priority status on Annex I of the E.U. Habitats Directive. One unusual type of lagoon, karstic rock lagoon, is particularly well represented. This type of lagoon is common on the Aran Islands, but on mainland Ireland, all but one are confined to this site. Additionally, the best example of all karstic lagoons in the country, Lough Murree, is found at this site. The flora of the habitat is rich and diverse, reflecting the range of salinities in the different lagoons. It is typically brackish, with two species of Tasselweed (Ruppia spp.), two Red Data charophytes Chara canescens and Lamprothamnion papulosum, and Chaetomorpha linum, an alga (all lagoonal specialists). The fauna of the lagoon is also rich, diverse and lagoonal. At least 10 lagoonal specialist species were recorded in 1996 and 1998 from the combined habitat of all the lagoons, which is one of the highest number for any lagoonal habitat in the country. Many of the species appear to be rare. The lagoons within this site are excellent examples of the habitat type and of high conservation importance.

Other terrestrial habitats within this site which are of conservation importance include Great Fen-sedge (Cladium mariscus)-dominated fen and Black Bog-rush (Schoenus nigricans)-dominated alkaline fen at Oranmore, a turlough of moderate size at Ballinacourty, limestone pavement at Ballyconry, Gleninagh North and Newquay, dry calcareous grassland with orchids (best examples occurring west of Salthill), Juniper (Juniperus communis) scrub formations at Oranmore, wet grassland and an area of deciduous woodland at Barna. The orchid-rich grassland occurs on a serious of small drumlin hills found to the west of Galway City, and is largely confined to the sides of the hills. Calcicole pecies such as Kidney Vetch (Anthyllis vulneraria), Harebell (Campanula rotundifolia), Spring Gentian (Gentiana verna), Common Spottedorchid (Dactylorhiza fuchsii), Lesser Twayblade (Listera ovata), Pyramidal Orchid (Anacamptis pyramidalis), Yellow-wort (Blackstonia

perfoliata) and Greater Knapweed (Centaurea scabiosa) are found here, among others. Juniper is also found in this area.

Areas of alkaline and Cladium fen as best represented near Oranmore, and species such as Great Fen-sedge, Common Reed (Phragmites australis), Purple Moor-grass (Molinia caerulea), Bogbean (Menyanthes trifoliata) and Long-stalked Yellow-sedge (Carex lepidocarpa) are found along with the usually dominant, Black Bog-rush. The turlough at Ballinacourty floods to about 25 ha in winter, and has vegetation with a typical zonation. Wetland species such as Amphibious Bistort (Polygonum amphibium), Common Marsh-bedstraw (Galium palustre) and Marsh Cinquefoil (Potentilla palustris) are found near the swallow-hole, with species of wet grassland close to the flood limit (e.g. Silverweed, Potentilla anserina, Water Mint, Mentha aquatica and Creeping Bent, Agrostis stolonifera). Sedges (Carex spp.) dominate in between.

Inner Galway Bay provides extensive good quality habitat for Common Seal (maximum count of 317 in the all-Ireland survey of 2003). This species is listed on Annex II of the E.U. Habitats Directive. The seals use a range of haul-out sites distributed through the bay - these include inner Oranmore Bay, Rabbit Island, St. Brendan's Island, Tawin Island, Kinvarra Bay, Aughinish Bay and Ballyvaughan. The site provides optimum habitat for Otter, also an Annex II-listed species.

Galway Bay is a very important ornithological site. The shallow waters provide excellent habitat for Great Northern Divers (35), Black-throated Divers (28), Scaup (39), Long-tailed Duck (27) and Red-breasted Merganser (232). (Figures given are peak average maxima over the 3 winters 1994/95 to 1996/97). All of these populations are of national importance. The intertidal areas and shoreline provides feeding and roosting habitat for wintering waterfowl, with Brent Goose (517) having a population of international importance and a further 11 species having populations of national importance. Four of the regular wintering species are listed on Annex I of the E.U. Birds Directive - Golden Plover, Bar-tailed Godwit and the two diver species. Breeding birds are also of importance, with significant populations of Sandwich Terns (81 pairs in 1995) and Common Terns (99 pairs in 1995), both also being listed on Annex I of the E.U. Birds Directive. A large Cormorant colony (approx. 300 pairs in 1989) occurs on Deer Island.

Fishing and aquaculture are the main commercial activities within the site. A concern is that sewage effluent and detritus of the aquaculture industry could be deleterious to benthic communities. Reef and sediment communities are vulnerable to disturbance or compaction from tractors accessing oyster trestles. The Paracentrotus lividus populations have been shown to be vulnerable to over-fishing. Extraction of maerl in Galway Bay is a threat. Owing to the proximity of Galway city, shoreline and terrestrial habitats are under pressure from urban expansion and recreational activities. Eutrophication is probably affecting some of the lagoons and is a continued threat. Drainage is a general threat to the turlough and fen habitats. Bird populations may be disturbed by aquaculture activities.

This large coastal site is of immense conservation importance, with many habitats listed on Annex I of the E.U. Habitats Directive, four of which have priority status (lagoon, Cladium fen, turlough and orchid-rich calcareous grassland). The

examples of shallow bays, reefs, lagoons and saltmarshes found within this site are amongst the best in the country. The site supports an important Common Seal colony and a breeding Otter population (Annex II species), and six regular Annex I E.U. Birds Directive species. The site also has four Red Data Book plant species, plus a host of rare or scarce marine and lagoonal animal and plant species.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Coastal lagoons [1150] **R**
- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Perennial vegetation of stony banks [1220] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
- Salicornia and other annuals colonising mud and sand [1310] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
- Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
- Turloughs [3180] **M**
- Juniperus communis formations on heaths or calcareous grasslands [5130] **R**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
- Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M**
- Alkaline fens [7230] **M**
- Limestone pavements [8240] **M***
- Lutra lutra (Otter) [1355] **R**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sandy mud community complex; and Intertidal sand community complex.

Qualifying Interests Feature: Coastal lagoons [1150] **R**
Conservation Objective: To restore the favourable conservation condition of Coastal lagoons in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: Chlorophyll *a* - Annual median chlorophyll *a* within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to at least 2m depth.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community complex and the maërl-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of Zostera-dominated communities, subject to natural processes.
Community structure - Conserve the high quality of the maërl-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sandy mud community complex; Intertidal sand community complex; Fine to medium sand with bivalves community complex; Sandy mud to mixed sediment community complex; Mixed sediment dominated by Mytilidae community complex; Shingle; Fucoid-dominated community complex; Laminaria-dominated community complex; and Shallow sponge-dominated community complex.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC

Attributes & Targets:
Distribution - The distribution of reefs is stable or increasing, subject to natural processes.
Habitat area - The permanent habitat area is stable, subject to natural processes.
Community extent - Maintain the extent of the Mytilus-dominated reef community, subject to natural processes.
Community structure: Mytilus density - Conserve the high quality of the Mytilus-dominated reef community, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Fucoid-dominated community complex; Laminariadominated community complex; and Shallow sponge-dominated community complex.

Qualifying Interests Feature: Perennial vegetation of stony banks [1220] **M**
Conservation Objective: To maintain the favourable conservation condition of Perennial vegetation of stony banks in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones. Typical species include sea sandwort (Honckenya peploides), sea beet (Beta vulgaris ssp maritima), rock samphire (Crithmum maritimum), sea mayweed (Tripleurospermum maritimum), yellow-horned poppy (Glaucium flavum) and sea campion (Silene uniflora).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Galway Bay Complex SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Salicornia and other annuals colonising mud and sand [1310] **M**
Conservation Objective: To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain, or where necessary restore creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
Conservation Objective: To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans – Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.

Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass.

Qualifying Interests Feature: Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
Conservation Objective: To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply - Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation in the sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass.

Qualifying Interests Feature: Turloughs [3180] **M**
Conservation Objective: To maintain the favourable conservation condition of Turloughs in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable at c.59ha or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.

Hydrological regime: flood duration, frequency, area, depth; permanently flooded area - Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Soil type: area - Variety, area and extent of soil types necessary to support turlough vegetation and other biota
Soil nutrient status: nitrogen and phosphorous - Nutrient status appropriate to soil types.
Physical structure: bare ground - Sufficient wet bare ground, as appropriate.
Chemical processes: calcium carbonate deposition and concentration - Appropriate CaCO3 deposition rates and concentration in soil.
Water quality: nutrients; colour; phytoplankton; epiphyton - Appropriate water quality to support the natural structure and functioning of the habitat.
Active peat formation - Active peat formation, where appropriate.
Vegetation composition: area of vegetation communities - Maintain area of sensitive and high conservation value vegetation communities/units at each turlough.
Vegetation composition: vegetation zonation - Maintain vegetation zonation/ mosaic characteristic of each turlough.
Vegetation structure: sward height – Sward heights appropriate to the vegetation unit, and a variety of sward heights across each turlough.
Typical species: terrestrial, wetland and aquatic plants, invertebrates and birds - Maintain typical species within and across all turloughs.
Fringing habitats: area – Maintain marginal fringing habitats that support turlough vegetation, invertebrate, mammal and/or bird populations.
Vegetation structure: turlough woodland - Maintain appropriate turlough woodland diversity and structure.

Qualifying Interests Feature: Juniperus communis formations on heaths or calcareous grasslands [5130] **R**
Conservation Objective: To restore the favourable conservation condition of Juniperus communis formations on heaths or calcareous grasslands in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Juniper population size - At least 50 plants
Formation structure: cover and height - Well-developed structure with an open to closed cover of juniper up to or exceeding 0.5 m in height with associated species.
Formation structure: community diversity and extent - Appropriate diversity and extent of formation.
Formation structure: cone-bearing plants - At least 10% of plants bearing cones.
Formation structure: seedling recruitment - At least 10% of juniper plants within the formation are seedlings.
Formation structure: dead plants - Not more than 10% of plants dead.
Vegetation composition: typical species - A variety of typical native species with a minimum of 10 species present (excluding negative indicator species).

Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
Conservation Objective: To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation composition: typical species - At least 7 positive indicator species present, including 2 "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%. Non- native invasive species, absent or under control.
Vegetation structure: sward height - 30-70% of sward 5-40cm high.
Vegetation structure: woody species and bracken (Pteridium aquilinum) - Cover of bracken (Pteridium aquilinum) and woody species (except juniper (Juniperus communis)) not more than 5% cover.
Physical structure: Bare ground - Not more than 10% bare ground.

Qualifying Interests Feature: Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M**
Conservation Objective: To maintain the favourable conservation condition of Calcareous fens with Cladium mariscus and species of the Caricion davallianae in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime - Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat.
Peat formation - Active peat formation, where appropriate.
Water quality: nutrients - Appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs not more than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%.
Physical structure: drainage - Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10%.

Qualifying Interests Feature: Alkaline fens [7230] **M**
Conservation Objective: To maintain the favourable conservation condition of Alkaline fens in Galway Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime - Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat.
Peat formation - Active peat formation, where appropriate.
Water quality: nutrients - Appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs not more than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%.
Physical structure: drainage - Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10%.

Qualifying Interests Feature: Limestone pavements [8240] **M***
Conservation Objective: To maintain the favourable conservation condition of Limestone pavements in Galway Bay Complex SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **R**
Conservation Objective: To restore the favourable conservation condition of Lutra lutra (Otter) in Galway Bay Complex SAC

Distribution - No significant decline.
Extent of terrestrial habitat - No significant decline.
Extent of marine habitat - No significant decline.
Extent of freshwater (river) habitat - No significant decline.
Extent of freshwater (lake/lagoon) habitat - No significant decline.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To restore the favourable conservation condition of Phoca vitulina (Harbour Seal) in Galway Bay Complex SAC

Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve breeding sites in a natural condition.
Moulting behaviour - Conserve moult haul-out sites in a natural condition.
Resting behaviour - Conserve resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the harbour seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The proposed development will be located entirely within the SAC. Construction works will have a direct impact and result in the permanent loss of 5.93 ha of Intertidal habitat [1170] Fucoid Dominated Reef habitat and [1140] Mud and Sand Flat habitat. The works will also result in the loss of perennial vegetation of 0.35 ha of Stony Bank [1220] due to the sheltering effect of the harbour extension.
- Coastal lagoons [1150], Large shallow inlets and bays [1160], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] and Mediterranean salt meadows (Juncetalia maritimi) - Taking a precautionary approach, there is potential for impacts to this QI habitat where it occurs in the SAC, which is dependent on aquatic inputs, as a result of pre-construction and construction activities associated with the Proposed Development. A potential for adverse effect was identified.
- [1355] Otter (Lutra lutra) and [1365] Phoca vitulina (Harbour Seal) - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the harbour seal and otter population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Reefs [1170] **M** • Perennial vegetation of stony banks [1220] **M** • Coastal lagoons [1150] • Large shallow inlets and bays [1160] **M** • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Turloughs [3180], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia), Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210], Alkaline fens [7230], and Limestone pavements [8240] due to the terrestrial nature of the QI habitat and/or the

• Mediterranean salt meadows (Juncetalia maritimi) [1410] **R** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M*** • Salicornia and other annuals colonising mud and sand [1310] **M** • Turloughs [3180] **M** • Juniperus communis formations on heaths or calcareous grasslands [5130] **R** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M** • Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M** • Alkaline fens [7230] **M** • Limestone pavements [8240] **M*** **Qualifying Interests (QI): Species** • Lutra lutra (Otter) [1355] **R** • Phoca vitulina (Harbour Seal) [1365] **M**	distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>** Direct and permanent loss of 5.93 ha of Intertidal habitat [1170] Fucoid Dominated Reef habitat and [1140] Mud and Sand Flat habitat will result in the conservation objectives for these features not being met. Loss of perennial vegetation of 0.35 ha of Stony Bank [1220] due to the sheltering effect of the harbour extension will also have a significant adverse effect on the integrity of the SAC. **<u>Compensatory Measures Plan required</u>** The Risk to QI's applies to hydrologically linked interest features due to adverse impacts from construction activities to Coastal lagoons [1150], Large shallow inlets and bays [1160], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] and Mediterranean salt meadows (Juncetalia maritimi). The risk to the [1355] Otter (Lutra lutra) and [1365] Phoca vitulina (Harbour Seal) applies based on the hydrological link and water quality deterioration from construction activities potentially affecting fish stocks. The risk of disturbance effects on otters and Harbour seal associated with construction and operational activities applies. **<u>Mitigation required</u>**

2. AA Summary Matrix for Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (000190)

Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (NPWS Site Code: 000190) – the SAC is located c.161km to the north of the site.
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, this large and scenic site covers the northern half of the Slieve League peninsula in Co. Donegal, stretching from Ardara in the east towards Glencolmbkille and Glen Bay in the west. Along its northern side, the site is fringed by a range of coastal habitats, including sea cliffs, stacks, islets, caves, sand dunes, the Loughros Beg Bay estuary and salt marshes. Inland, the area is generally mountainous, rising to 511 m O.D. south of Lough Croaghballaghdown. The underlying rock is quartzite.

Other typical microhabitats of blanket bog occur, including peaty pools which are colonised by Lesser Bladderwort (Utricularia minor) and the bog moss Sphagnum cuspidatum, and quaking Sphagnum lawns colonised by species such as Bog-sedge (Carex limosa).

Upslope, the peat layer becomes generally thinner and the vegetation becomes more heathy. Heather becomes more abundant and some good stands of mature heather are present, with a deep bryophyte understorey. The tiny orchid, Lesser Twayblade (Listera cordata), occurs under Heather here: this species is rather local in its occurrence. Scarce species of liverwort (Lophozia sudetica) and the lichen Cladonia arbuscula occur here also. Typical heath vegetation covers the upper slopes and fringes the cliff-tops along the coast. Along with Heather, Bilberry (Vaccinium myrtillus), Crowberry (Empetrum nigrum), Bell Heather (Erica cinerea), Sheep's-fescue (Festuca ovina) and Tormentil (Potentilla erecta) are abundant. Juniper (Juniperus communis), Bearberry (Arctostaphylos uva-ursi) and Fir Clubmoss (Huperzia selago), species characteristic of alpine heath, are also present. In places, heath vegetation forms a mosaic with acid grassland, characterised by abundant Mat-grass (Nardus stricta), Viviparous Fescue (Festuca vivipara) and Heath Bedstraw (Galium saxatile). Towards the coast, the maritime influence is evident in the presence of species such as Buck's-horn Plantain (Plantago coronopus) and Sea Plantain (P. maritima) in heath and grassland communities.

The site includes a number of oligotrophic lakes, lying mostly above 100–200 m, and these support a range of aquatic plant species, such as Shoreweed (Littorella uniflora), Water-milfoil (Myriophyllum alternifolium) and Quillwort (Isoetes lacustris). In addition, the rare and protected aquatic fern Pillwort (Pillularia globulifera) has been recorded from one of the lakes.

Fringing the northern side of Slieve Tooey are impressive cliffs which are colonised by vegetation, including Thrift (Armeria maritima), Sea Arrowgrass (Triglochin maritima), Black Spleenwort (Asplenium adiantum-nigrum) and the scarce species Roseroot (Rhodiola rosea). At Maghera, a sand dune system juts into Loughros Beg Bay. The mobile dunes are colonised by Marram (Ammophila

arenaria), with occasional Sea-holly (Eryngium maritimum) and Hogweed (Heracleum sphondylium). Fixed dunes support a more species-rich vegetation with abundant legume species (Leguminosae) and where they climb slopes with shallow sand, they give way to dunes with creeping willow. Fixed dune habitat comprises approximately 52% of the total sand dune habitat at Maghera. The site is one of the few highly acidic/decalcified dune systems in the country so the habitat occurs in a complex mosaic with dune heath. The abundance of Peltigera and Cladonia lichens is further evidence of the calcium poor status of the substrate. The site is notable for the extensive and well-developed areas of dune heath, with such species as Heather and Crowberry growing on the sandy soils. Dune slacks, or damp hollows in the dunes, are characterised by either the typical calcareous dune flora or by species indicative of acidic conditions, and the nationally scarce fern-ally Ophioglossum azoricum has been found in a calcareous slack.

Saltmarsh has developed on shallow shores in sheltered coastal locations. Typical species include Sea-milkwort (Glaux maritima), Sea Club-rush (Scirpus maritimus), Sea Rush (Juncus maritimus) and Saltmarsh Rush (J. gerardi).

The cliffs and rocky islets in this site, in particular Tormore Island, provide important breeding habitat for seabirds, including Kittiwake, Razorbill, Guillemot, Fulmar and Puffin. Chough, a species listed on Annex I of the E.U. Birds Directive, also breed on the cliffs, with up to 13 pairs present in 1992. Merlin, as well as several pairs of Peregrine breed on the site, while Golden Plover may breed in small numbers on the bogs and heath. All three of these species are also listed on Annex I of the E.U. Birds Directive. Another species which utilises blanket bog on the site is Red Grouse, while Ring Ouzel visit some lakes in summer.

Grey Seal, a species listed on Annex II of the E.U. Habitats Directive, breed in sea caves in this site. The breeding population is estimated at 868-1116 individuals (in 2005). A one-off moult count in 2007 gave a figure of 92 seals. Otter, also an Annex II species, occurs throughout much of the site. In 2000 a population of the rare snail Vertigo angustior was discovered in the sand dunes at Glen Bay. This is one of only two known sites in Donegal for this mollusc, which is listed on Annex II of the E.U. Habitats Directive.

This large site is of major ecological significance for its range of good quality coastal and terrestrial habitats. Intact blanket bog is an increasingly rare habitat type and is recognised as such in having priority status on Annex I of the E.U. Habitats Directive. This site contains some good examples of this habitat, with typical features and a representative flora. A lot of the habitat, however, is suffering from the effects of over-grazing by sheep. On higher slopes, the bog forms an interesting mosaic with upland heath and grassland communities, in which a number of scarce species of lower plant occur. The coastal habitats in the site are also intact and of good quality, and provide important habitat for breeding birds and seals, as well as the rare whorl snail.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M***
- Mediterranean salt meadows (Juncetalia maritimi) [1410] **M***
- Embryonic shifting dunes [2110] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **M***
- Decalcified fixed dunes with Empetrum nigrum [2140] **M**
- Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] **M**
- Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M***
- Humid dune slacks [2190] **M***
- Alpine and Boreal heaths [4060] **R**
- Blanket bogs (* if active bog) [7130] **R**
- Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
- Lutra lutra (Otter) [1355] **M**
- Halichoerus grypus (Grey Seal) [1364] **M**

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC

Attributes & Targets:
Habitat length - Area stable, subject to natural processes, including erosion.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and hydrological regime - No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures.
Vegetation structure: zonation - Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: bracken and woody species - Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M***
Conservation Objective: To maintain the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Mediterranean salt meadows (Juncetalia maritimi) [1410] **M***
Conservation Objective: To maintain the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **M**
Conservation Objective: To maintain the favourable conservation condition of Embryonic shifting dunes in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions
Vegetation structure: zonation – Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-native species) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses - More than 95% of marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **M***
Conservation Objective: To maintain the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC.

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Decalcified fixed dunes with Empetrum nigrum [2140] **M**
Conservation Objective: To maintain the favourable conservation condition of Decalcified fixed dunes with Empetrum nigrum in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.

Vegetation structure: zonation – Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] **M**
Conservation Objective: To maintain the favourable conservation condition of Atlantic decalcified fixed dunes (Calluno-Ulicetea) in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation – Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M***
Conservation Objective: To maintain the favourable conservation condition of Dunes with Salix repens ssp. argentea (Salicion arenariae) in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC.

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Humid dune slacks [2190] **M***
Conservation Objective: To maintain the favourable conservation condition of Humid dune slacks in Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC.

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Alpine and Boreal heaths [4060] **R**
Conservation Objective: To restore the favourable conservation condition of Alpine and Boreal heaths in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: lichens and bryophytes - Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three.
Vegetation composition: positive indicator species - Cover of positive indicator species at least 66%.
Vegetation composition: dwarf-shrub species - Cover of dwarf-shrub species at least 10%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 10%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation structure: signs of grazing - Less than 10% collectively of the live leaves of specific graminoids showing signs of grazing.
Vegetation structure: signs of browsing - Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry (Empetrum nigrum) showing signs of browsing.
Vegetation structure: burning - No signs of burning within the habitat.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Blanket bogs (* if active bog) [7130] **R**
Conservation Objective: To restore the favourable conservation condition of Blanket bogs in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Habitat area - Stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Ecosystem function: peat formation - At least 99% of the total Annex I blanket bog area is active bog.

Ecosystem function: hydrology - Natural hydrology unaffected by drains and erosion.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: positive indicator species - Number of positive indicator species at each monitoring stop is at least seven.
Vegetation composition: lichens and bryophytes - Cover of bryophytes or lichens, excluding Sphagnum fallax, at least 10%.
Vegetation composition: potential dominant species - Cover of each of the potential dominant species less than 75%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and scrub - Cover of scattered native trees and shrubs less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: erosion - Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

Qualifying Interests Feature: Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
Conservation Objective: To maintain the favourable conservation condition of Vertigo angustior (Narrow-mouthed Whorl Snail) in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Distribution: occupied sites - No decline.
Occurrence in suitable habitat - A minimum of 25% positive samples in areas of habitat that are at least sub-optimal.
Habitat quality - 90m of the established monitoring transect assessed as at least sub-optimal or at least 60% of samples within suitable habitat polygon at least sub-optimal.
Optimal soil wetness - 90m of the established monitoring transect assessed as optimal wetness or at least 60% of sampling stops assessed as optimal wetness.
Habitat extent - Area of suitable habitat stable or increasing subject to natural processes and at least 7.1ha.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **M**
Conservation Objective: To maintain the favourable conservation condition of Lutra lutra (Otter) in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Distribution - No significant decline.
Extent of terrestrial habitat - No significant decline.
Extent of marine habitat - No significant decline.
Extent of freshwater (river) habitat - No significant decline.
Extent of freshwater (lake/lagoon) habitat - No significant decline.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Halichoerus grypus (Grey Seal) in Slieve Tooey/Tormore Island/Loughros Beg Bay SAC

Attributes & Targets:
Access to suitable habitat - Species range within the SAC should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haulout sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the SAC.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.161km to the north of the site within the range of mobile mammal species. Due to the intervening distance between the SAC and the Proposed Development site, there is no source-pathway-receptor chain for adverse effect on Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Decalcified fixed dunes with Empetrum nigrum [2140], Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170], Humid dune slacks [2190], Alpine and Boreal heaths [4060], Blanket bogs (* if active bog) [7130], Lutra lutra (Otter) [1355], Vertigo angustior (Narrow-mouthed Whorl Snail) [1014].

- Halichoerus grypus (Grey Seal) [1364] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the grey seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M** • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M*** • Mediterranean salt meadows (Juncetalia maritimi) [1410] **M*** • Embryonic shifting dunes [2110] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **M*** • Decalcified fixed dunes with Empetrum nigrum [2140] **M** • Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] **M** • Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M*** • Humid dune slacks [2190] **M*** • Alpine and Boreal heaths [4060] **R** • Blanket bogs (* if active bog) [7130] **R** **Qualifying Interests (QI): Species** • Lutra lutra (Otter) [1355] **M** • Halichoerus grypus (Grey Seal) [1364] **M** • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Decalcified fixed dunes with Empetrum nigrum [2140], Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170], Humid dune slacks [2190], Alpine and Boreal heaths [4060], and Blanket bogs (* if active bog) [7130] screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>** Lutra lutra (Otter) [1355] and Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] screened out from likely impacts due to the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>** The risk to the Halichoerus grypus (Grey Seal) [1364] applies based on the hydrological link and water quality

	deterioration from pre-construction and construction activities potentially affecting fish stocks. The risk of disturbance effects on Grey seal associated with construction and operational activities applies. **<u>Mitigation required</u>**

3. AA Summary Matrix for Inishbofin and Inishshark SAC (000278)

Inishbofin and Inishshark SAC (000278) – the SAC is located c.81km to the north of the site.
Inishbofin and Inishshark SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, this site is situated off the Co. Galway coast, about 5.5 km from the mainland. It comprises two main islands, Inishbofin and Inishshark, with several islets and stacks. Part of the surrounding marine waters are also included. The islands are composed almost entirely of Silurian slates and shales and rise to heights of 89 m (Inishbofin) and 69 m (Inishshark).

Inishbofin is the only inhabited island in the group, with a population of about 300 people. Two-thirds of the island is commonage, where the main habitat type is heath, represented by both dry and wet heath communities. There are many areas of relatively intact dry heath present on Inishbofin, particularly around the middle and eastern quarter of the island. In most places this heath is associated with higher ground and exposed rock outcrops. Some areas of bog and marsh occur, and plantain (Plantago spp.) swards exist on the clifftops. Several small oligotrophic lakes are present. The largest waterbody, Lough Bofin, has a brackish character and is classified as a lagoon. A small area of sand dune occurs at the eastern side of the island. The remainder of the island is under cultivation, with most of the area under grass for pasture, and to a lesser degree, hay. Additionally, a small proportion remains where potatoes and grain-crops are planted.

Areas with dry heath support such species as semi-prostrate Heather (Calluna vulgaris), Mat-grass (Nardus stricta), Bell Heather (Erica cinerea), Carnation Sedge (Carex panicea), Viviparous Fescue (Festuca vivipara), Tormentil (Potentilla erecta), Sweet Vernal-grass (Anthoxanthum odoratum), Common Bent (Agrostis capillaris), Heath-grass (Danthonia decumbens), Wild Thyme (Thymus praecox) and Sheep's-bit (Jasione montana). The rare Spotted Rock-rose (Tuberaria guttata) also occurs. The dry heath habitat generally merges seawards to Plantago sward, and landwards to patches of bog vegetation, Nardus grassland or wet heath with Erica tetralix.

Inishbofin has some good examples of lowland hay meadows. The habitat supports a typically diverse flora with such species as Yellow-rattle (Rhinanthus minor), Red Clover (Trifolium pratense), Creeping Buttercup (Ranunculus repens), Sheep's Sorrel (Rumex acetosella), Ribwort Plantain (Plantago lanceolata), Hogweed (Heracleum sphondylium), Silverweed (Potentilla anserina), Cocks-foot (Dactylis glomerata), Curled Dock (Rumex crispus), Hedge Woundwort (Stachys sylvatica), Selfheal (Prunella vulgaris), Meadow Vetchling (Lathyrus pratensis), Wild Carrot (Daucus carota), Autumn Hawkbit (Leontodon autumnalis), Purple Loosestrife (Lythrum salicaria) and Bracken (Pteridium aquilinum).

Sea cliffs are found on the western and north-eastern parts of Inishbofin, as well as on Inishshark. In places these support a species-rich vegetation with such species as Wild Angelica (Angelica sylvestris), Thrift (Armeria maritima), Stag's-horn Plantain (Plantago coronopus), Roseroot (Rhodiola rosea), Bell Heather, Common Bird's-foottrefoil (Lotus corniculatus), Yorkshire-fog (Holcus lanatus), Dandelion (Taraxacum agg.), Bracken, Primrose (Primula vulgaris), Honeysuckle (Lonicera periclymenum), Common Sorrel (Rumex acetosa), English Stonecrop (Sedum anglicum) and Royal Fern (Osmunda regalis). Cliff-top vegetation frequently comprises a short turf usually dominated by Stag's-horn Plantain, Sea Plantain (Plantago maritima) and Thrift. This often grades inland to Nardus grassland, heath or marsh communities, where such species as Wild Thyme, Allseed (Radiola linoides), Sheep's-bit, Common Centaury (Centaurium erythraea), Bog Pimpernel (Anagallis tenella), Dandelion, Heath-grass, Kidney Vetch (Anthyllis vulneraria), Marsh Pennywort (Hydrocotyle vulgaris) and a variety of lichens are found.

Lough Gowlanagower is one of a number of small oligotrophic lakes present on Inishbofin. The north-eastern side of the lake supports good communities of Pipewort (Eriocaulon aquaticum) and Water Lobelia (Lobelia dortmanna).

Lough Bofin is an excellent example of an isolated sedimentary lagoon with a cobble barrier. This type of lagoon is relatively rare in Ireland. The lagoon is shallow (c. 2 m) and salinity varies considerably (oligo-euhaline). Seawater enters by percolation and by overtopping the cobble barrier, and large volumes of fresh water enter at times of high rainfall. The lagoon is in an almost completely natural condition, of which there are very few examples in Europe. Floristically, the lagoon is very interesting; it supports the rare charophyte Foxtail Stonewort (Lamprothamnion papulosum), a lagoonal specialist which is listed in the Red Data Book and protected under the Flora (Protection) Order, 1999. It also supports two species of Tassleweed (Ruppia maritima and R. cirrhosa) and Chaetomorpha linum, all of which are lagoonal specialists. The vegetation is an excellent example of a Ruppia/ Lamprothamnion community and the plankton appears to contain unusual brackish species of the genus Prorcentrum. The fauna of the lagoon is species-poor, with only one lagoonal specialist, Jaera nordmanni (Order Crustacea), recorded. The absence of other lagoonal specialists may be due to the relative isolation of the site.

Inishshark is located to the south-west of Inishbofin and was inhabited up until the 1960s. The main habitats here are heath and rough pasture, and there are no trees.

There is a well-developed Plantago sward on the western side, where there are also some high cliffs. The other sizeable islands in the group are Inishgort, to the south- east of Inishshark, and Davillaun, to the east of Inishbofin.

In addition to Foxtail Stonewort there are records from Inishbofin for several other nationally rare Red Data Book species - Spotted Rockrose, for which there are recent records, Wood Small-reed (Calamagrostis epigejos), last seen in 1967, and Marsh Clubmoss (Lycopodiella inundata), last recorded in 1911. The latter two species are also protected under the Flora (Protection) Order, 1999. Darnel (Lolium temulentum), also a Red Data Book species, was recorded from Inishshark in 1875. Three lichen species known in Ireland only from west Galway occur on Inishbofin - Catapyrenium cinerum, Opegrapha paraxanthoides and Lecidella umboella var. alumula.

The site supports a breeding colony of Grey Seal, a species that is listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 749-963 individuals (in 2005). A one-off moult count in 2007 gave a figure of 270 seals.

The site is an important ornithological site. It supports breeding Manx Shearwater (200-300 pairs) and wintering Barnacle Goose (up to 640 individuals), the latter a species that is listed on Annex I of the E.U. Birds Directive. Nationally important numbers of Fulmar (824 pairs) and small numbers of the Annex I species Storm Petrel (> 30 pairs) also breed. A pair of Peregrine has nested for many years, while small numbers of Chough breed and forage on the main islands. Corncrake was once abundant on the islands but declined in the 1960s until the early 1990s when none was recorded. More recently, however, the species has been recorded from the site – 1996, 1997 (two singing males) and 2003. In 1995 27 pairs of Arctic Tern, an Annex I species, were recorded. Other breeding birds recorded from the site include Shag and Black Guillemot.

In recent times, over-grazing by sheep, and to a lesser extent rabbits, has caused damage to the vegetation cover of the islands. Cutting of the shallow peat is also considered a problem.

The site is of considerable conservation significance for the presence of an excellent example of a lagoon, a habitat listed with priority status on Annex I of the E.U. Habitats Directive, and for the good examples of heath, sea cliff, hay meadow and other vegetation communities typical of exposed western islands that it supports. The presence of a breeding colony of Grey Seal, a species that is listed on Annex II of the E.U. Habitats Directive, as well as populations of rare Red Data Book plant species and of important bird populations adds significantly to the importance of the site.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Coastal lagoons [1150] **R**
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
- Northern Atlantic wet heaths with Erica tetralix [4010] **R**
- European dry heaths [4030] **R**
- Halichoerus grypus (Grey Seal) [1364] **M**

Qualifying Interests Feature: Coastal lagoons [1150] **R**
Conservation Objective: To restore the favourable conservation condition of Coastal lagoons in Inishbofin and Inishshark SAC.

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: Chlorophyll *a* - Annual median chlorophyll *a* within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges and less than 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to maximum depth of lagoon.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Inishbofin and Inishshark SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Maintain maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/ absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon level.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110.

Qualifying Interests Feature: Northern Atlantic wet heaths with Erica tetralix [4010] **R**
Conservation Objective: To restore the favourable conservation condition of Northern Atlantic wet heaths with Erica tetralix in Inishbofin and Inishshark SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline from current distribution, subject to natural processes.
Ecosystem function: soil nutrient status - Maintain soil nutrient status within natural range.
Vegetation composition: cross-leaved heath - Cross-leaved heath (Erica tetralix) present.
Vegetation composition: positive indicator species - Cover of positive indicator species, as listed in Perrin et al. (2014) at least 50%.

Vegetation composition: lichens and bryophytes - Total cover of Cladonia and Sphagnum species, Racomitrium lanuginosum and pleurocarpous mosses at least 10%.
Vegetation composition: ericoid species - Cover of ericoid species at least 15%.
Vegetation composition: rare/scarce species - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.
Vegetation composition: dwarf-shrub species - Cover of dwarf shrub species collectively less than 75%.
Vegetation composition: negative indicator species - Cover of negative indicator species collectively less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning inside sensitive areas.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.

Qualifying Interests Feature: European dry heaths [4030] **R**
Conservation Objective: To restore the favourable conservation condition of European dry heaths Inishbofin and Inishshark SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution – No decline, subject to natural processes.
Ecosystem function: soil nutrient status - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - At least two positive indicator species, as listed in Perrin et al. (2014), with combined cover of at least 50%.
Vegetation composition: bryophyte and non-crustose lichen species - At least three bryophyte or non-crustose lichen species present, excluding Campylopus and Polytrichum moss species.
Vegetation composition: rare/scarce species - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.
Vegetation structure: dwarf shrub species - Cover of bog myrtle (Myrica gale), creeping willow (Salix repens) and Western gorse (Ulex gallii) collectively less than 50%.

Vegetation composition: negative indicator species - Cover of negative indicator species collectively less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: senescent ling - Senescent proportion of ling (Calluna vulgaris) cover less than 50%.
Vegetation structure: growth phases of ling - Outside boundaries of sensitive areas, all growth phases of ling (Calluna vulgaris) should occur throughout, with at least 10% of cover in mature phase.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning inside sensitive areas.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Halichoerus grypus (Grey Seal) in Inishbofin and Inishshark SAC.

Attributes & Targets:
Access to suitable habitat - Species range within the SAC should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.81km to the northwest of the site within the range of mobile mammal species. Due to the intervening distance between the SAC and the Proposed Development site, there is no source-pathway-receptor chain for adverse effect on Coastal lagoons [1150], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Northern Atlantic wet heaths with Erica tetralix [4010] and European dry heaths [4030].
- Halichoerus grypus (Grey Seal) [1364] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities,

thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the grey seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Coastal lagoons [1150] **R** • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M** • Northern Atlantic wet heaths with Erica tetralix [4010] **R** • European dry heaths [4030] **R** **Qualifying Interests (QI): Species** • Halichoerus grypus (Grey Seal) [1364] **M**	Coastal lagoons [1150], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Northern Atlantic wet heaths with Erica tetralix [4010] and European dry heaths [4030] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required** The risk to the Halichoerus grypus (Grey Seal) [1364] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish stocks. The risk of disturbance effects on Grey seal associated with construction and operational activities applies. **Mitigation required**

4. AA Summary for Lough Corrib SAC (000297)

Lough Corrib SAC (000297) is located a distance of 0.6km to the northwest of the site.
Lough Corrib SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, Lough Corrib is situated to the north of Galway city and is the second largest lake in Ireland, with an area of approximately 18,240 ha (the entire site is 20,556 ha). The

lake can be divided into two parts: a relatively shallow basin, underlain by Carboniferous limestone, in the south, and a larger, deeper basin, underlain by more acidic granite, schists, shales and sandstones to the north. The surrounding lands to the south and east are mostly pastoral farmland, while bog and heath predominate to the west and north. A number of rivers are included within the SAC as they are important for Atlantic Salmon. These rivers include the Clare, Grange, Abbert, Sinking, Dalgan and Black to the east, as well as the Cong, Bealanabrack, Failmore, Cornamona, Drimneen and Owenriff to the west. In addition to the rivers and lake basin, adjoining areas of conservation interest, including raised bog, woodland, grassland and limestone pavement, have been incorporated into the site.

The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (Charophytes) in Ireland, with species such as Chara aspera, C. hispida, C. delicatula, C. contraria and C. desmacantha mixed with submerged pondweeds (Potamogeton perfoliatus, P. gramineus and P. lucens), Shoreweed (Littorella uniflora) and Water Lobelia (Lobelia dortmanna). These Chara beds are an important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters, without Chara species, but with Shoreweed, Water Lobelia, Pipewort (Eriocaulon aquaticum), Quillwort (Isoetes lacustris), Alternate Water-milfoil (Myriophyllum alternifolium) and Slender Naiad (Najas flexilis). The last-named is listed under the Flora (Protection) Order, 2015, and is an Annex II species under the E.U. Habitats Directive.

Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (Phragmites australis) and Common Club-rush (Scirpus lacustris), occur around the margins of the lake. Reedswamp usually grades into species-rich marsh vegetation characterised by Slender Sedge (Carex lasiocarpa), Water Mint (Mentha aquatica), Water Horsetail (Equisetum fluviatile) and Bogbean (Menyanthes trifoliata). Of particular note are the extensive beds of Great Fen-sedge (Cladium mariscus) that have developed over the marly peat deposits in sheltered bays, particularly in the southeast corner of the lake. Alkaline fen vegetation is more widespread around the lake margins and includes, amongst the typically diverse range of plants, the Slender Cottongrass (Eriophorum gracile), a species protected under the Flora (Protection) Order, 2015. Wet meadows dominated by Purple Moor-grass (Molinia caerulea) occur in seasonally flooded areas close to the lake shore. These support species such as Sharp-flowered Rush (Juncus acutiflorus), Jointed Rush (J. articulatus), Carnation Sedge (Carex panicea), Devil’s-bit Scabious (Succisa pratensis), Creeping Bent (Agrostis stolonifera) and Tormentil (Potentilla erecta), amongst others.

This large site contains four discrete raised bog areas and is selected for active raised bog, degraded raised bog, Rhynchosporion and bog woodland. Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (Sphagnum spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, Sphagnum lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The

Rhynchosporion habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (Rhynchospora alba) and/or Brown Beak-sedge (R. fusca), and at least some of the following associated species, Bog Asphodel (Narthecium ossifragum), sundews (Drosera spp.), Deergrass (Scirpus cespitosus) and Carnation Sedge.

At Addergoole, on the eastern shores of Lough Corrib, there is an important area of western raised bog. This bog area is one of the most westerly, relatively intact raised bogs in the country. There are also other substantial areas of raised bog along various tributaries of the Corrib in east Co. Galway, namely Slieve Bog, Lough Tee Bog and Killaclogher bog. The active parts of these bogs mostly correspond to the wettest areas, where there are well-developed surface features with hummocks, lawns and pools. It is in such areas that Rhynchosporion vegetation is best represented. The dominant species is the aquatic bog moss Sphagnum cuspidatum, which is usually accompanied by Bogbean, White Beak-sedge, Bog Asphodel, Common Cottongrass (Eriophorum angustifolium), Bog Sedge (Carex limosa) and Great Sundew (Drosera anglica). Brown Beak-sedge, a locally rare plant of wet bog pools, has been recorded from a number of the bog areas within the site. At Addergoole a substantial bog lake or soak occurs and this is infilling with large rafts of Rhynchosporion vegetation at present. This area is associated with an important area of wet bog woodland dominated by Downy Birch (Betula pubescens).

The largest part of the uncut high bog comprises degraded raised bog. Degraded bog is dominated by a raised bog flora which tends to be rather species-poor because of disturbance and/or drying-out. The most conspicuous vascular plant species are usually Carnation Sedge, Heather (Calluna vulgaris), Cottongrasses, Cross-leaved Heath (Erica tetralix), Bog Asphodel and Deergrass. Bog-rosemary (Andromeda polifolia) and Cranberry (Vaccinium oxycoccos), two species indicative of raised bog habitat, are frequent on both degraded and active areas of raised bog. Sphagnum cover is generally low within degraded areas due to a combination of drying-out and frequent burning.

Limestone pavement occurs along much of the shoreline in the lower Corrib basin, and supports a rich and diverse flora, including Herb-Robert (Geranium robertianum), Bloody Crane's-bill (G. sanguineum), Carline Thistle (Carlina vulgaris), Spring Gentian (Gentiana verna), Wild Thyme (Thymus praecox), Rustyback (Ceterach officinarum), Wood Sage (Teucrium scorodonia), Slender St. John's-wort (Hypericum pulchrum), Quaking-grass (Briza media) and Blue Moor-grass (Sesleria albicans). Areas of Hazel (Corylus avellana) scrub occur in association with exposed limestone pavement and these include species such as Hawthorn (Crataegus monogyna), Buckthorn (Rhamnus catharticus), Spindle (Euonymus europaeus), with occasional Juniper (Juniperus communis). Three Red Data Book species are also found in association with limestone scrub - Alder Buckthorn (Frangula alnus), Shrubby Cinquefoil (Potentilla fruticosa) and Wood Bitter-vetch (Vicia orobus), the latter is also protected under the Flora (Protection) Order, 2015.

Open areas of orchid-rich calcareous grassland are also found in association with the limestone exposures. These can support a typically rich vegetation, including

many orchids such as Pyramidal Orchid (Anacamptis pyramidalis), Common Spotted-orchid (Dactylorhiza fuchsii), Early-purple Orchid (Orchis mascula), Frog Orchid (Coeloglossum viride), Fragrant Orchid (Gymnadenia conopsea), Marsh Helleborine (Epipactis palustris), Greater Butterfly-orchid (Platanthera chlorantha) and Irish Lady's-tresses (Spiranthes romanzoffiana). The latter is protected under the Flora (Protection) Order, 2015.

The Hill of Doon, located in the north-western corner of the lake, is a fine example of a Sessile Oak (Quercus petraea) woodland. The understorey is dominated by Sessile Oak, Holly (Ilex aquifolium) and occasional Juniper. There are occasional Yew (Taxus baccata) and Ash (Fraxinus excelsior), and a well-developed ground layer dominated by Bilberry (Vaccinium myrtillus), Hard Fern (Blechnum spicant) and Wood Rush (Luzula sylvatica). Woodland also occurs on some of the islands in the lake.

A number of the rivers in the site support submerged and floating vegetation of the Ranunculion fluitantis and Callitricho-Batrachion, including mosses. For example, in the River Corrib species such as Shining Pondweed (Potamogeton lucens), Perfoliate Pondweed (Potamogeton perfoliatus), Small Pondweed (P. berchtoldii), Yellow Waterlily (Nuphar lutea), White Water-lily (Nymphaea alba) and stoneworts (Chara spp.) occur.

The rare and Annex II-listed Slender Green Feather-moss (Hamatocaulis vernicosus, formerly known as Drepanocladus vernicosus) is found at the fen at Gortachalla, north-east of Moycullen. Here it is widespread around the margins, and this constitutes a large and significant population in the national context. A very large population of another rare moss, Pseudocalliergon trifarium, is also found in this area.

The lake is rated as an internationally important site for waterfowl. Counts from 1984 to 1987 revealed a mean annual peak total of 19,994 birds. In the past a maximum peak of 38,281 birds was recorded. The lake supports internationally important numbers of Pochard (average peak 8,600) and nationally important numbers of the following species: Coot (average peak 6,756), Mute Swan (average peak 176), Tufted Duck (average peak 1,317), Cormorant (average peak 110) and Greenland Whitefronted Goose (average peak 83). The latter species is listed on Annex I of the E.U. Birds Directive. The Coot population is the largest in the country and populations of Tufted Duck and Pochard are second only to Lough Neagh. Breeding pairs of Common Scoter on the lake number 30-41 (1995 data), as well as breeding populations of Arctic Tern and Common Tern. Other bird species of note recorded from or close to the lake recently include Hen Harrier, Whooper Swan, Golden Plover and Kingfisher. All of these species are listed on Annex I of the E.U. Birds Directive.

Otter and Irish Hare have been recorded regularly within this site. Both of these species are listed in the Red Data Book and are legally protected by the Wildlife Act, 1976. Otter is also listed on Annex II of the E.U. Habitats Directive. Lough Corrib is considered one of the best sites in the country for Otter, due to the sheer size of the lake and associated rivers and streams, and also the generally high

quality of the habitats. Atlantic Salmon (Salmo salar) use the lake and rivers as spawning grounds.

Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. Lough Corrib is also a well-known fishing lake with a very good Trout (Salmo trutta) fishery. The lake has a population of Sea Lamprey (Petromyzon marinus), a scarce, though probably under-recorded species listed on Annex II of the E.U. Habitats Directive. Brook Lamprey (Lampetra planeri), also listed on Annex II, are also known from a number of areas within the site.

A population of Freshwater Pearl Mussel (Margaritifera margaritifera), a species listed on Annex II of the E.U. Habitats Directive, occurs within the site. White-clawed Crayfish (Austropotamobius pallipes), also listed on Annex II, is well distributed throughout Lough Corrib and its in-flowing rivers over limestone. A summer roost of Lesser Horseshoe Bat, another Annex II species, occurs within the site - approximately 100 animals were recorded here in 1999.

The main threats to the quality of this site are from water polluting activities resulting from intensification of agricultural activities on the eastern side of the lake, uncontrolled discharge of sewage which is causing localised eutrophication of the lake, and housing and boating development, which is causing the loss of native lakeshore vegetation. The raised bog habitats are susceptible to further degradation and drying out due to drainage and peat cutting and, on occasions, burning. Peat cutting threatens Addergoole Bog and already a substantial area of it has been cut away. Fishing and shooting occur in and around the lake. Introduction of exotic crayfish species or the crayfish fungal plague (Aphanomyces astaci) could have a serious impact on the native crayfish population. The bat roost is susceptible to disturbance or development.

Despite these ongoing issues, however, Lough Corrib is one the best examples of a large lacustrine catchment system in Ireland, with a range of habitats and species still well represented. These include 15 habitats which are listed on Annex I of the E.U. Habitats Directive, six of which are priority habitats, and nine species which are listed on Annex II. The lake is also internationally important for birds and is designated as a Special Protection Area.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **R**
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **R**
- Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **R**

- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
- Active raised bogs [7110] **R**
- Degraded raised bogs still capable of natural regeneration [7120] **None**
- Depressions on peat substrates of the Rhynchosporion [7150] **None**
- Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M**
- Petrifying springs with tufa formation (Cratoneurion) [7220] **M**
- Alkaline fens [7230] **M**
- Limestone pavements [8240] **M**
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M**
- Bog woodland [91D0] **M**
- Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R**
- Austropotamobius pallipes (White-clawed Crayfish) [1092] **M**
- Lampetra planeri (Brook Lamprey) [1096] **M**
- Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] **R**
- Najas flexilis (Slender Naiad) [1833] **M**
- Hamatocaulis vernicosus (Slender Green Feather-moss) [6216] **M**
- Petromyzon marinus (Sea Lamprey) [1095] **R**
- Salmo salar (Salmon) [1106] **M**
- Lutra lutra (Otter) [1355] **M**

Qualifying Interests Feature: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **R**
Conservation Objective: To restore the favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable, subject to slight natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Restore maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Restore appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.

Water quality: nutrients - Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Restore appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Restore/maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Restore/maintain appropriate organic carbon levels to support the habitat.
Turbidity - Restore/maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110.

Qualifying Interests Feature: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **R**
Conservation Objective: To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Restore maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Restore appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Restore appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.

Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Restore/maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Restore/maintain appropriate organic carbon levels to support the habitat.
Turbidity - Restore/maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130.

Qualifying Interests Feature: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **R**
Conservation Objective: To restore the favourable conservation condition of Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. in Lough Corrib SAC

Attributes & Targets:
Habitat area - Area stable, subject to slight natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Restore maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Restore appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Restore appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Restore/maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Restore/maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Restore/maintain appropriate organic carbon levels to support the habitat.
Turbidity - Restore/maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140.

Qualifying Interests Feature: Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
Conservation Objective: To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable, subject to slight natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime: river flow - Maintain appropriate hydrological regimes.
Hydrological regime: groundwater discharge - Maintain appropriate hydrological regimes.
Substratum composition: particle size range - Maintain appropriate substratum particle size range, quantity and quality, subject to natural process.
Water quality - Maintain appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Typical species of the relevant habitat sub-type should be present and in good condition.
Floodplain connectivity: area - The area of active floodplain at and upstream of the habitat should be maintained.
Riparian habitat: area - Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
Conservation Objective: To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable, subject to slight natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40% and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
Conservation Objective: To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to slight natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including one "high quality" species as listed in O'Neill et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: moss species - Hair mosses (Polytrichum spp.) not more than 25% cover.
Vegetation composition: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5%.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40% and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Active raised bogs [7110] **R**
Conservation Objective: To restore the favourable conservation condition of Active raised bogs in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Restore the area of active raised bog to 78.8ha, subject to natural processes.
Habitat distribution - Restore the distribution and variability of active raised bog across the SAC.
High bog area - No decline in extent of high bog subject to the conservation requirements of the SAC.
Hydrological regime: water levels - Restore appropriate water levels throughout each site.
Hydrological regime: flow patterns - Restore, where possible, appropriate high bog topography, flow directions and slopes.

Transitional areas between high bog and adjacent mineral soils (including cutover areas) - Restore adequate transitional areas to support/protect the raised bog ecosystem and the services it provides.
Vegetation quality: central ecotope, active flush, soaks, bog woodland - Restore 39.4ha of central ecotope/active flush/soaks/bog woodland as appropriate.
Vegetation quality: microtopographical features - Restore adequate cover of high quality microtopographical features.
Vegetation quality: bog moss (Sphagnum) species - Restore adequate cover of bog moss (Sphagnum) species to ensure peat-forming capacity.
Typical ARB species: flora - Restore, where appropriate, typical active raised bog flora.
Typical ARB species: fauna - Restore, where appropriate, typical active raised bog fauna.
Elements of local distinctiveness - Maintain features of local distinctiveness, subject to natural processes.
Negative physical indicators - Negative physical features absent or insignificant.
Vegetation composition: native negative indicator species - Native negative indicator species at insignificant levels.
Vegetation composition: non-native invasive species - Non-native invasive species at insignificant levels and not more than 1% cover.
Air quality: nitrogen deposition - Air quality surrounding the bogs close to natural reference conditions. The total nitrogen deposition should not exceed 5kg N/ha/yr.
Water quality - Water quality on the high bog and in transitional areas close to natural reference conditions.

Qualifying Interests Feature: Degraded raised bogs still capable of natural regeneration [7120] **None**
Conservation Objective: The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Lough Corrib SAC.

Qualifying Interests Feature: Depressions on peat substrates of the Rhynchosporion [7150] **None**
Conservation Objective: Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in Lough Corrib SAC

Qualifying Interests Feature: Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M**
Conservation Objective: To maintain the favourable conservation condition of Calcareous fens with Cladium mariscus and species of the Caricion davallianae in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: hydrology - Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Ecosystem function: peat formation - Maintain active peat formation, where appropriate.
Ecosystem function: water quality - Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat.
Vegetation structure: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%.
Physical structure: drainage - Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Petrifying springs with tufa formation (Cratoneurion) [7220] **M**
Conservation Objective: To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime: height of water table; water flow - Maintain appropriate hydrological regimes.
Water quality - nitrate level - No increase from baseline nitrate level and less than 10mg/l.
Water quality - phosphate level - No increase from baseline phosphate level and less than 15µg/l.
Vegetation composition: positive indicator species - At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number.
Vegetation composition: negative indicator species - Potentially negative indicator species should not be Dominant or Abundant; invasive species should be absent.
Vegetation structure: sward height - Field layer height between 10cm and 50cm (except for bryophyte-dominated ground.
Physical structure: trampling/dung - Cover should not be Dominant or Abundant.

Qualifying Interests Feature: Alkaline fens [7230] **M**
Conservation Objective: To maintain the favourable conservation condition of Alkaline fens in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Ecosystem function: peat formation - Maintain active peat formation, where appropriate.
Ecosystem function: hydrology - Maintain appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Ecosystem function: water quality - Maintain appropriate water quality, particularly nutrient levels, to support the natural structure and functioning of the habitat.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: number of positive indicator species (brown mosses) - Number of brown moss species present at each monitoring stop is at least one.
Vegetation composition: number of positive indicator species (vascular plants) - Number of positive vascular plant indicator species present at each monitoring stop is at least two for small-sedge flushes and at least three for black bog-rush (Schoenus nigricans) flush and bottle sedge (Carex rostrata) fen.
Vegetation composition: cover of positive indicator species - Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (Schoenus nigricans) flush and bottle sedge (Carex rostrata) fen.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Vegetation composition: soft rush and common reed cover - Total cover of soft rush (Juncus effusus) and common reed (Phragmites australis) less than 10%.
Vegetation structure: height - Proportion of live leaves and/or flowering shoots of vascular plants that are more than 5cm above the ground surface should be at least 50%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%.
Physical structure: tufa formations - Disturbed proportion of vegetation cover where tufa is present is less than 1%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

Qualifying Interests Feature: Limestone pavements [8240] **M**
Conservation Objective: To maintain the favourable conservation condition of Limestone pavements in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Distribution - No decline, subject to natural processes. Map 7 shows the indicative distribution in the southern part of the SAC, including mosaics with other habitats.
Vegetation composition: typical species - At least seven positive indicator species present.
Vegetation composition: bryophyte layer - Bryophyte cover at least 50% on wooded pavement.
Vegetation composition: negative indicator species - Collective cover of negative indicator species on exposed pavement not more than 1%.
Vegetation composition: non-native species - Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration.
Vegetation composition: scrub - Scrub cover no more than 25% of exposed pavement.
Vegetation composition: bracken cover - Bracken (Pteridium aquilinum) cover no more than 10% on exposed pavement.
Vegetation structure: woodland canopy - Canopy cover on wooded pavement at least 30%.
Vegetation structure: dead wood - Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms.
Physical structure: disturbance - No evidence of grazing pressure on wooded pavement.
Indicators of local distinctiveness - Indicators of local distinctiveness are maintained.

Qualifying Interests Feature: Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M**
Conservation Objective: To maintain the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in Lough Corrib SAC.

Attributes & Targets:
Habitat area – Area stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Woodland size - Area stable or increasing. Where topographically possible, "large"; woods at least 25ha in size and “small” woods at least 3ha in size.
Woodland structure: cover and height - Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer.
Woodland structure: community diversity and extent - Maintain diversity and extent of community types.
Woodland structure: natural regeneration - Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.

Woodland structure: dead wood - At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter.
Woodland structure: veteran trees - No decline.
Woodland structure: indicators of local distinctiveness - No decline.
Vegetation composition: native tree cover - No decline. Native tree cover not less than 95%.
Vegetation composition: typical species - A variety of typical native species present, depending on woodland type, including oak (Quercus petraea) and birch (Betula pubescens).
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.

Qualifying Interests Feature: Bog woodland [91D0] **M**
Conservation Objective: To maintain the favourable conservation condition of Bog woodland in the British Isles in Lough Corrib SAC.

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes. At least 1.22ha.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: positive indicator species - Birch (Betula pubescens), bog moss (Sphagnum) species and at least five other indicator species present.
Vegetation composition: negative indicator species - Both native and non-native invasive species absent or under control. Total cover should be less than 10%.
Woodland structure: cover and height of birch - A minimum 30% cover of birch (Betula pubescens) with a median canopy height of 4m.
Woodland structure: dwarf shrub cover - Dwarf shrub cover not more than 50%.
Woodland structure: ling cover - Ling (Calluna vulgaris) cover not more than 40%.
Woodland structure: bryophyte cover - Bryophyte cover at least 50%, with bog moss (Sphagnum spp.) cover at least 25%.
Woodland structure: tree size classes - Each size class present.
Woodland structure: senescent and dead wood - Senescent or dead wood present.

Qualifying Interests Feature: Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R**
Conservation Objective: To restore the favourable conservation condition of Margaritifera margaritifera (Freshwater Pearl Mussel) in the British Isles in Lough Corrib SAC.

Attributes & Targets:
Distribution - Maintain at 9.1km.
Population size - Restore Owenriff population to at least one million adult mussels.

Population structure: recruitment - Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length.
Population structure: adult mortality - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution.
Suitable habitat: extent - Restore suitable habitat in more than 8.3km in the Owenriff and Glenawbeg rivers (see map 9) and any additional stretches necessary for salmonid spawning.
Suitable habitat: condition - Restore condition of suitable habitat.
Water quality: macroinvertebrate and phytobenthos (diatoms) - Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93.
Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants) - Restore substratum quality - filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%).
Substratum quality: sediment - Restore substratum quality - stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment.
Substratum quality: oxygen availability - Restore to no more than 20% decline from water column to 5cm depth in substrate.
Hydrological regime: flow variability - Restore appropriate hydrological regimes. Host fish - Maintain sufficient juvenile salmonids to host glochidial larvae.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the population.

Qualifying Interests Feature: Austropotamobius pallipes (White-clawed Crayfish) [1092] **M**
Conservation Objective: To maintain the favourable conservation condition of Austropotamobius pallipes (White-clawed Crayfish) in Lough Corrib SAC.

Attributes & Targets:
Distribution: rivers - No reduction from baseline.
Distribution: Lough Corrib - No reduction from baseline.
Population structure: recruitment - Juveniles and/or females with eggs in all occupied tributaries and occupied parts of Lough Corrib**.**
Negative indicator species - No alien crayfish species.
Disease - No instances of disease.
Water quality - At least Q3-4 at all sites sampled by EPA.
Habitat quality: heterogeneity - No decline in habitat heterogeneity or habitat quality.

Qualifying Interests Feature: Petromyzon marinus (Sea Lamprey) [1095] **R**
Conservation Objective: To restore the favourable conservation condition of Petromyzon marinus (Sea Lamprey) in Lough Corrib SAC.

Attributes & Targets:

Distribution: extent of anadromy - Greater than 75% of main stem length of rivers accessible from estuary.
Population structure of juveniles - At least three age/size groups present.
Juvenile density in fine sediment - Mean catchment juvenile density at least 1/m².
Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds.
Availability of juvenile habitat - More than 50% of sample sites positive, with a minimum of four positive sites in a catchment, which are at least 5km apart.

Qualifying Interests Feature: Lampetra planeri (Brook Lamprey) [1096] **M**
Conservation Objective: To maintain the favourable conservation condition of Lampetra planeri (Brook Lamprey) in Lough Corrib SAC.

Attributes & Targets:
Distribution - Access to all watercourses down to first order streams.
Population structure of juveniles - At least three age/size groups of brook/river lamprey present.
Juvenile density in fine sediment - Mean catchment ammocoete density of brook/river lamprey at least 5/m².
Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds.
Availability of juvenile habitat - More than 50% of sample sites positive.

Qualifying Interests Feature: Salmo salar (Salmon) [1106] **M**
Conservation Objective: To restore the favourable conservation condition of almo salar (Salmon) in Lough Corrib SAC.

Attributes & Targets:
Distribution: extent of anadromy - 100% of river channels down to second order accessible from estuary.
Adult spawning fish - Conservation limit (CL) for each system consistently exceeded.
Salmon fry abundance - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling.
Out-migrating smolt abundance - No significant decline.
Number and distribution of redds - No decline in number and distribution of spawning redds due to anthropogenic causes.
Water quality - At least Q4 at all sites sampled by EPA.

Qualifying Interests Feature: Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] **R**
Conservation Objective: To restore the favourable conservation condition of Rhinolophus hipposideros (Lesser Horseshoe Bat) in Lough Corrib SAC.

Attributes & Targets:
Population per roost - Minimum number of 100 bats for summer roost (roost id. 217 in NPWS database).
Summer roosts - No decline.
Number of auxillary roosts - No decline.
Extent of potential foraging habitat - No significant decline.
Linear features - No significant loss, within 2.5km of qualifying roosts.
Light pollution - No significant increase in artificial light intensity adjacent to named roost or along commuting routes within 2.5km of the roost.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **M**
Conservation Objective: To maintain the favourable conservation condition of Lutra lutra (Otter) in Lough Corrib SAC.

Attributes & Targets:
Distribution - No significant decline.
Extent of terrestrial habitat - No significant decline. Area mapped and calculated as 1,054ha along river banks/ lake shoreline/around ponds.
Extent of freshwater (river) habitat - No significant decline.
Extent of freshwater (lake) habitat - No significant decline.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Hamatocaulis vernicosus (Slender Green Feather-moss) [1393] **M**
Conservation Objective: To maintain the favourable conservation condition of Rhinolophus hipposideros (Lesser Horseshoe Bat) in Lough Corrib SAC.

Attributes & Targets:
Distribution of Populations - No decline, subject to natural processes.
Population size - No decline, subject to natural processes.
Population cover - Mean percentage cover of slender green feather-moss (Hamatocaulis vernicosus) should be at least 45%.
Area of suitable habitat - No decline, subject to natural processes.
Hydrological conditions: water table level - Maintain suitable hydrological conditions.
Vegetation composition: tree cover - Mean percentage tree cover should be less than 15%.
Vegetation composition: shrub cover - Mean percentage shrub cover should be less than 20%.
Vegetation composition: grass cover - Mean percentage grass species cover should be less than 25%.
Vegetation composition: bryophyte cover - Mean percentage bryophyte cover should be more than 50%.
Vegetation composition: cover of Calliergonella cuspidate - Mean percentage cover of Calliergonella cuspidata should be less than 15%.

Vegetation structure: vegetation height - Mean vegetation height should not exceed 40cm.

Qualifying Interests Feature: Najas flexilis (Slender Naiad) [1833] **M**
Conservation Objective: To restore the favourable conservation condition of Najas flexilis (Slender Naiad) in Lough Corrib SAC.

Attributes & Targets:
Population extent - Restore the spatial extent of Najas flexilis within the lake, subject to natural processes.
Population depth - Restore the depth range of Najas flexilis within the lake, subject to natural processes.
Population viability - Restore plant fitness, subject to natural processes.
Population abundance - Restore the cover abundance of Najas flexilis, subject to natural processes.
Species distribution - Restore to at least the north-western bay, subject to natural processes.
Habitat extent - Restore, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat for the species.
Lake substratum quality - Restore appropriate substratum type, extent and chemistry to support the population of the species.
Water quality - Restore appropriate water quality to support the population of the species.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the population of Najas flexilis, subject to natural processes.
Water colour - Restore/maintain appropriate water colour to support the population of Najas flexilis.
Associated species - Restore appropriate associated species and vegetation communities to support the population of Najas flexilis.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the population of Najas flexilis.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.0.6km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae), Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], 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],

Active raised bogs [7110], Degraded raised bogs still capable of natural regeneration [7120], Depressions on peat substrates of the Rhynchosporion [7150], Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210], Petrifying springs with tufa formation (Cratoneurion) [7220], Alkaline fens [7230], Limestone pavements [8240], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Bog woodland [91D0], Margaritifera margaritifera (Freshwater Pearl Mussel) [1029], Austropotamobius pallipes (White-clawed Crayfish) [1092], Lampetra planeri (Brook Lamprey) [1096], Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303], Najas flexilis (Slender Naiad) [1833], Hamatocaulis vernicosus (Slender Green Feather-moss) [6216].

- Lutra lutra (Otter) [1355], Petromyzon marinus (Sea Lamprey) [1095] and Salmo salar (Salmon) [1106] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the otter sea lamprey and salmon population associated with the SAC also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Habitats • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **R** • Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **R** • Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **R** • Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M** • Molinia meadows on calcareous, peaty or clayey-silt-	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae), Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], 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], Active raised bogs [7110], Degraded raised bogs still capable of natural regeneration [7120], Depressions on peat substrates of the Rhynchosporion [7150], Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210], Petrifying springs with tufa formation (Cratoneurion) [7220],

laden soils (Molinion caeruleae) [6410] **M** • Active raised bogs [7110] **R** • Degraded raised bogs still capable of natural regeneration [7120] **None** • Depressions on peat substrates of the Rhynchosporion [7150] **None** • Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] **M** • Petrifying springs with tufa formation (Cratoneurion) [7220] **M** • Alkaline fens [7230] **M** • Limestone pavements [8240] **M** • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M** • Bog woodland [91D0] **M** • Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R** • Austropotamobius pallipes (White-clawed Crayfish) [1092] **M** • Lampetra planeri (Brook Lamprey) [1096] **M** • Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] **R** • Najas flexilis (Slender Naiad) [1833] **M** • Hamatocaulis vernicosus (Slender Green Feather-moss) [6216] **M** • Petromyzon marinus (Sea Lamprey) [1095] **R** • Salmo salar (Salmon) [1106] **M** **Qualifying Interests (QI): Species** • Lutra lutra (Otter) [1355] **M**	Alkaline fens [7230], Limestone pavements [8240], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Bog woodland [91D0], Margaritifera margaritifera (Freshwater Pearl Mussel) [1029], Austropotamobius pallipes (White-clawed Crayfish) [1092], Lampetra planeri (Brook Lamprey) [1096], Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303], Najas flexilis (Slender Naiad) [1833], Hamatocaulis vernicosus (Slender Green Feather-moss) [6216] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>** The risk to Lutra lutra (Otter) [1355], Petromyzon marinus (Sea Lamprey) [1095] and Salmo salar (Salmon) [1106] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Otter, Sea Lamprey and Salmon associated with construction and operational activities applies. **<u>Mitigation required</u>**

5. AA Summary Matrix for Slyne Head Islands SAC (000328)

Slyne Head Islands SAC (000328) – the SAC is located c.77km to the northwest of the site.
Slyne Head Islands SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, the site comprises a long archipelago of islands, islets, rocks and reefs located off the western shores and south-western tip of the Slyne Head Peninsula in Co. Galway. The surrounding shallow marine areas are also included as part of the site. The islands are mostly low-lying and have a covering of a grassy maritime turf. A few sandy coves occur on the larger islands, along with shingle. The islands are uninhabited apart from an automated lighthouse on Illaunamid.

Slyne Head Islands SAC contains excellent examples of reefs, ranging from those extremely exposed to wave action to more sheltered ones. The complexity of the islands helps provide a good range of habitat conditions, and many typical communities are present. The rocky shores moderately exposed to wave action have an excellent example of community zonation down the shore, with an extensive zone of grey lichens followed by a zone of black lichens. Below this there is a narrow band of Channel Wrack (Pelvetia canaliculata) and following this an extensive area of limpets and barnacles. The mid shore has an extensive zone of Fucus serratus and in the lower shore Fucus serratus and Himanthalia elongata are common. The sublittoral fringe has a mixture of Laminaria saccharina and L. digitata.

Subtidally the reefs range from being very rugged to gently sloping. In shallow water kelp forests of Laminaria hyperborea are present, but at 25 m the kelp is sparse and the brown alga Dictyota dichotoma is abundant. Some areas are heavily grazed by the sea urchin Echinus esculentus. The red alga Drachiella spectabilis, which is a good indicator of clear water, occurs here. Where vertical rock is present it supports a community of bryozoans and sponges, including the rare species Plakortis simplex. At depths of 30 m or greater excellent examples of the Axinellid cup sponge community are present, typical of reefs exposed to wave action. In this area, both the cup sponges Axinella infundibuliformis and Phakellia ventilabrum are found, along with the red soft coral Alcyonium glomeratum, the sea fan Eunicella verrucosa, the rose ‘coral’ Pentapora foliacea and the sea squirt Diazona violacea. Rare or uncommon species found in this community include two sponges, Phakellia vermiculata and Lissodendoryx sp., the rare sea slug Aldisa zetlandica, the hydroid Tamarisca tamarisca and the brachiopod Terebratulina retusa. Areas of stony gravel dunes within the site support a community characterised by the burrowing sea cucumber Neopentadactyla mixta.

The site contains an important breeding colony of Grey Seal, a species listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 238- 306 individuals (in 2005). A one-off moult count in 2007 gave a figure of 162 seals. Waters within the site also support groups of the Annex II species Bottlenose Dolphin (Tursiops truncatus) that are likely to be part of a population

inhabiting the west and north coasts of Connacht and which numbers at least 177-337 dolphins. Group sizes of up to 12 individual dolphins have been recorded within the site and sighting records have predominantly occurred in September. The islands also support important colonies of breeding seabirds. In 1995, 329 pairs of Arctic Tern were recorded on Illaunamid - this was one of the largest colonies in Ireland and comprised 11.3% of the national total. Terns have also bred on Chapel Island in the past. Also of national importance is the colony of Black Guillemots, with 60 individuals counted in 1980. Other seabirds which breed include Storm Petrel (50 pairs), Manx Shearwater (70-90 pairs), Shag (6-8 pairs), Herring Gull (50 pairs) and Great Black-backed Gull (30 pairs) – all figures from 1980. Of the above seabird species, Arctic Tern and Storm Petrel are listed on Annex I of the E.U. Birds Directive. This site is an important example of exposed low-lying western islands with good examples of reefs, a significant grey seal population and important colonies of breeding birds. The site is also of conservation importance due to the occurrence of groups of Bottlenose Dolphin, a species listed on Annex II of the E.U. Habitats Directive

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Reefs [1170] **M**
- Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
- Halichoerus grypus (Grey Seal) [1364] **M**

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Slyne Head Islands SAC

Attributes & Targets:
Distribution - The distribution of reefs is stable or increasing, subject to natural processes.
Habitat area - The permanent area is stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: exposed intertidal reef community complex; Laminaria-dominated community; and exposed subtidal reef with echinoderms and encrusting algae community.

Qualifying Interests Feature: Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
Conservation Objective: To maintain the Favourable conservation condition of Bottlenose Dolphin (Tursiops truncatus) in Slyne Head Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the Bottlenose Dolphin population at the site.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Grey Seal in Slyne Head Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haulout sites in a natural condition.
Resting behaviour - Conserve the resting haulout sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the site.

Potential for Impact / Mitigation Measures
Potential for Impacts

- The SAC is located c.77km to the northwest of the site within the range of mobile mammal species. Due to the intervening distance between the SAC and the Proposed Development site, there is no source-pathway-receptor chain for adverse effect on Reefs [1170].
- Halichoerus grypus (Grey Seal) [1364] and Tursiops truncatus (Common Bottlenose Dolphin) [1349] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the grey seal and bottlenose dolphin population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Reefs [1170] **M**	Reefs [1170] are screened out from likely impacts due to the terrestrial nature of the QI habitat and the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**

Qualifying Interests (QI): Species • Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M** • Halichoerus grypus (Grey Seal) [1364] **M**	The risk to Tursiops truncatus (Common Bottlenose Dolphin) [1349] and Halichoerus grypus (Grey Seal) [1364] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Bottlenose Dolphin and Grey Seal associated with construction and operational activities applies. **Mitigation required**

6. AA Summary Matrix for Duvillaun Islands (000495)

Duvillaun Islands (000495) is located c.116km to the northwest of the site.
Duvillaun Islands SAC | National Parks & Wildlife Service

Description of the Site: The Duvillaun Islands comprise a group of marine islands, rocks and reefs 3 km off the southern tip of the Mullet Peninsula, Co. Mayo. The main islands included are Duvillaun More, Duvillaun Beg, Turduvillaun, Gaghta Island, Keely Island and Leamareha Island.

The Duvillaun Islands form part of a larger group of islands, together with the Inishkeas, Inishkeeragh and Inishglora, which hold an important breeding population of Grey Seal. The breeding population is estimated at 648-833 individuals (in 2005).

According to the Site Synopsis for this SAC, waters around the Duvillaun Islands support groups of Bottlenose Dolphin (Tursiops truncatus) that are part of a population inhabiting the west and north coasts of Connacht and which numbers at least 177-337 dolphins. This species is also listed on Annex II of the Habitats Directive. Group sizes of 2-20 individual dolphins, including calves, have been recorded around these islands. So far all dolphin records within the site have occurred in the month of April. Bottlenose Dolphin records from adjacent coastal waters of the Mullet Peninsula and Inishkea island group have occurred in all seasons.

The Duvillaun Islands are also of ornithological interest for their colonies of breeding seabirds and wintering geese. They hold the second largest colony of Great Black- backed Gull in Ireland (217 pairs during 1985-87). Other nationally important colonies include Cormorant (185 pairs), Shag (30-50 pairs), Fulmar (500 pairs), Common Gull (20-50 pairs) and Black Guillemot (80 individuals). Large numbers of Herring Gull are also found (300-400 pairs) (all figures are from 1981). Storm Petrel occur on Duvillaun More (14 colonies in 1966, total numbers are unknown, but probably at least 100 pairs).

The islands are also used as a wintering ground for internationally important numbers of Barnacle Goose (420-450 individuals in 1988), which interchange with the largest Irish population on the nearby Inishkea Islands.

Approximately two-thirds of Duvillaun More is covered by grass, and the island is grazed by sheep and rabbits. The other islands support little or no vegetation. The main threat to the Grey Seal population at this site is from illegal culling; nesting birds would be vulnerable to disturbance during breeding.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
- Halichoerus grypus (Grey Seal) [1364] **M**

Qualifying Interests Feature: Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
Conservation Objective: To maintain the Favourable conservation condition of Bottlenose Dolphin (Tursiops truncatus) in Duvillaun Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the Bottlenose Dolphin population at the site.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Grey Seal in Duvillaun Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haulout sites in a natural condition.
Resting behaviour - Conserve the resting haulout sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.116km to the northwest of the site within the range of mobile mammal species.
- Halichoerus grypus (Grey Seal) [1364] and Tursiops truncatus (Common Bottlenose Dolphin) [1349] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the grey seal and bottlenose dolphin population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Species • Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M** • Halichoerus grypus (Grey Seal) [1364] **M**	The risk to Tursiops truncatus (Common Bottlenose Dolphin) [1349] and Halichoerus grypus (Grey Seal) [1364] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Bottlenose Dolphin and Grey Seal associated with construction and operational activities applies. **Mitigation required**

7. AA Summary Matrix for Inishkea Islands SAC (000507)

Inishkea Islands SAC (000507) is located c.121km to the northwest of the site.
Inishkea Islands SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, the Inishkea Islands are the two largest islands off the west coast of the Mullet Peninsula in north-west Co. Mayo. As well as Inishkea North and Inishkea South, this site includes Carrickawilt, Carrigee, Carrickmoylenacurhoga, Pluddany Rocks, Carrickfad, Carrickgormal, Carricklaur, Carrickalaveen and several smaller rocks and reefs.

The north island is low-lying and dominated by machair vegetation, typified by a Plantain sward (Plantago spp.), with Red Fescue (Festuca rubra), Smooth Meadow-grass (Poa pratensis), White Clover (Trifolium repens) and Daisy (Bellis perennis). A small lake, Doon Lough, which occurs at the northern end of the

island, supports a vigorous growth of Mare's-tail (Hippuris vulgaris) and is bounded by a bed of Common Reed (Phragmites australis). The south island has a low-lying cover of machair vegetation in the northern part, but is characterised by a heath-covered ridge and hill (70 m O.D.) to the south. The dominant heath plants are Heather (Calluna vulgaris), Heath-grass (Danthonia decumbens), Devil's-bit Scabious (Succisa pratensis), Sheep's-bit (Jasione montana) and Creeping Willow (Salix repens). The outlying rocks and reefs are largely unvegetated.

The Inishkeas, together with a group of neighbouring islands, including Inishglora, Inishkeeragh and the Duvillauns, are an important breeding site for Grey Seal, a species listed on Annex II of the E.U. Habitats Directive. The breeding population is estimated at 665-855 individuals (in 2005). A one-off moult count in 2007 gave a figure of 1,742 seals.

A population of the liverwort Petalwort (Petalophyllum ralfsii) occurs on North Inishkea. This species is listed on Annex II of the E.U. Habitats Directive. It is a species typically associated with machair habitat.

The Inishkeas are of ornithological interest for breeding seabirds. The following figures are derived from the 1984 and 1995 Tern Surveys, respectively, and refer to number of pairs recorded. Arctic Tern (220; 73), Common Tern (20; 1), Little Tern (41; 4). All three species are listed on Annex I of the E.U. Birds Directive. Numbers for other seabirds from 1984 are as follows: Great Black-backed Gull (c. 558 individuals), Herring Gull (c. 304 individuals), Lesser Black-backed Gull (5 individuals), Common Gull (15 individuals), Black-headed Gull (15 individuals), Black Guillemot (10 pairs pre-1988). Important concentrations of breeding Oystercatcher (136 pairs), Lapwing (14 pairs), Ringed Plover (31 pairs), Redshank (5 pairs), Snipe (5 pairs) and Dunlin (5 pairs) also occur.

The islands are the main wintering site for Barnacle Goose in Ireland and hold internationally important numbers (22-year mean 2,230; max. 2,800). The geese also make much use of neighbouring islands, particularly the Duvillauns and Inishkeeragh. Nationally important numbers of wintering Golden Plover (1,500 pre-1988), Sanderling (200 pre-1988), Purple Sandpiper (175 pre-1988) and Turnstone (400 pre-1988) are also found.

There are remains of a village on both main islands, but, although still used for sheep and cattle grazing, the islands have been uninhabited since 1932.

In summary, the Inishkea Islands site is very important for machair, a habitat rare in Europe and given priority status under the E.U. Habitats Directive. The significance of the site is added to by the presence of a population of the rare liverwort Petalophyllum ralfsii. It is also an important area for wintering and breeding populations of birds, particularly Barnacle Goose. The Inishkeas are part of a group of islands off the Mullet Peninsula that are an important breeding ground for Grey Seal.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Machairs (* in Ireland) [21A0] **R**
- Halichoerus grypus (Grey Seal) [1364] **M**
- Petalophyllum ralfsii (Petalwort) [1395] **M**

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **R**
Conservation Objective: To restore the favourable conservation condition of Machairs in Inishkea Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of Machair habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.
Vegetation composition: bryophytes - Should always be at least an occasional component of the vegetation.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Grey Seal in Inishkea Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the site.

Qualifying Interests Feature: Petalophyllum ralfsii (Petalwort) [1395] **M**
Conservation Objective: To maintain the favourable conservation condition of Petalophyllum ralfsii (Petalwort) in Inishkea Islands SAC

Attributes & Targets:
Distribution of populations - No decline.
Population size - No decline. The population has been estimated at a miniumum of 7 thalli.
Area of suitable habitat - No decline. Area of suitable habitat at North Inishkea currently unknown, but thought to be very small, c.0.00003ha.
Hydrological conditions: soil moisture - Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter.
Vegetation: open structure - Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.121km to the northwest of the site within the range of mobile mammal species. Due to the intervening distance between the SAC and the Proposed Development site, there is no source-pathway-receptor chain for adverse effect on Machairs (* in Ireland) [21A0] and Petalophyllum ralfsii (Petalwort) [1395].
- Halichoerus grypus (Grey Seal) [1364] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the grey seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Machairs (* in Ireland) [21A0] **R** • Petalophyllum ralfsii (Petalwort) [1395] **M**	Reefs [1170] are screened out from likely impacts due to the terrestrial nature of the QI habitat due and the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>**
Qualifying Interests (QI): Species	The risk to Halichoerus grypus (Grey Seal) [1364] applies based on the

• Halichoerus grypus (Grey Seal) [1364] **M**	hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Bottlenose Dolphin and Grey Seal associated with construction and operational activities applies. **<u>Mitigation required</u>**

8. AA Summary Matrix for Maumturk Mountains SAC (002008)

Maumturk Mountains SAC (002008) is located c.38.6km to the northwest of the site.
Maumturk Mountains SAC | National Parks & Wildlife Service

Description of the Site: The Maumturk Mountains are situated east of the Twelve Bens and west of the Maumtrasnas, between the Inagh Valley and the Leenaun/Maam road in Co. Galway. The site is bounded to the north by Killary Harbour and to the south by the Galway/ Clifden road. Most of the mountains exceed 600 m in height and about half of the land within the site lies above an altitude of 250 m. In addition many rivers criss-cross the site. The main bedrock is quartzite in the south, which forms impressive cliffs but little mineral soil, and shales and slates in the northern area, which weather more easily. Bands of metamorphosed limestone (Lakes Marble Formation) occur at Lissoughter, Maumeen Gap at Knocknagur and Maamturkmore.

According to the Site Synopsis for this SAC, Wet heath is widespread within this site on the margins of areas of blanket bog and on the lower slopes of mountains where peat depth is less than 1m. The vegetation is typically dominated by Purple Moor-grass (Molinia caerulea), with Cross-leaved Heath (Erica tetralix) and Heather (Calluna vulgaris) locally sub-dominant. Other frequent species include Tormentil (Potentilla erecta), Heath Milkwort (Polygala serpyllifolia), Many-stalked Spike-rush (Eleocharis multicaulis), Bog Asphodel (Narthecium ossifragum) and the sedges Carex echinata and C. panicea. On drier, more steep slopes, dry heath is present with Bell Heather (Erica cinerea) a typical frequent species. Over-grazing by sheep has greatly modified the structure and composition of the heath communities, with a reduction in Heather cover and in places the initiation of soil erosion.

Blanket bog also occurs within this site, some of which is intact and of good quality, with a particularly good example at Caher. Typical bog species are found, including Heather, Purple Moor-grass, Black Bog-rush (Schoenus nigricans), Bog Asphodel, Cross-leaved Heath, Common Cottongrass (Eriophorum angustifolium), Carnation Sedge (Carex panicea), the moss Racomitrium lanuginosum and locally frequent hummocks of the bog mosses Sphagnum fuscum and S. imbricatum. In

addition, the lichen flora is locally luxuriant and includes the rare Cladonia rangiferina. Flushes occur in some areas of the bog, such as on the south slope of Knocknagur. Here, species such as Bog Pondweed (Potamogeton polygonifolius), Bulbous Rush (Juncus bulbosus), Jointed Rush (Juncus articulatus),Many-stalked Spike-rush (Eleocharis multicaulis) and various sedges (Carex panicea, C. demissa and C. hostiana) are found. At this location, the scarce Brown Beak-sedge (Rhynchospora fusca) is common in the surrounding bog.

Rhynchosporion vegetation is associated with the blanket bog in a few areas of the site. It is characterised by well developed inter-connecting pool systems with quaking carpets of Sphagnum. The pool areas are typically dominated by Sphagnum cuspidatum and S. auriculatum, with Common Cottongrass, Bogbean (Menyanthes trifoliata), and sundews (Drosera anglica and D. intermedia). The quaking flat areas are dominated by White-beaked Sedge (Rhynchospora alba), Bog Asphodel and Common Cottongrass.

Oligotrophic lakes are well represented in this site, occurring mainly in the southeast near Maam Cross. The principal lakes are Lough Shindilla, Loughanillaun, Lough Nambrackboy, Lough Shannagrena, Maumwee Lough and Lehanagh Lough. Most of these are small to medium sized systems and are of good quality. Typical oligotrophic aquatic species occur, including Quillwort (Isoetes lacustris), Pipewort (Eriocaulon aquaticum), Water Lobelia (Lobelia dortmanna), Shoreweed (Littorella uniflora) and Alternate Water-milfoil (Myriophyllum alterniflorum). Spawning salmon and trout occur in Maumwee Lough, and perhaps others.

Other habitats present include lowland blanket bog, siliceous quartzite scree, exposed rock, upland grassland on peaty and mineral substrates, river valleys and streams, lakes, and woodland on lake islands.

In areas where base-rich rocks occur at altitude, e.g. Maumeen Gap and Lissoughter, scarce plant species such as Mountain Avens (Dryas octopetala), Alpine Meadow-rue (Thalictrum alpinum) and the Red Data Book species, Purple Saxifrage (Saxifraga oppositifolia), are found. The site supports a range of other scarce arcticalpine/mountain plants, including Green Spleenwort (Asplenium viride), Brittle Bladder-fern (Cystopteris fragilis), Holly Fern (Polystichum lonchitis), Beech Fern (Phegopteris connectilis), Starry Saxifrage (Saxifraga stellaris), Roseroot (Rhodiola rosea), Cowberry (Vaccinium vitis-idaea), Mountain Sorrel (Oxyria digyna), Dwarf Willow (Salix herbacea), Lesser Twayblade (Listera cordata), Stiff Sedge (Carex bigelowii) and Juniper (Juniperus communis).

Several other Red Data Book plant species are also found on the site, including Slender Cottongrass (Eriophorum gracile) and Slender Naiad (Najas flexilis), both occurring in just single locations. There is an old record from near Maam Cross for Wood Bitter-vetch (Vicia orobus), but this has not been seen on the site in recent years.

The threatened species Marsh Clubmoss (Lycopodiella inundata) also occurs within the site. All of these species are legally protected under the Flora

(Protection) Order, 1999, and Slender Naiad is also listed on Annex II of the E.U. Habitats Directive.

The site is very important for salmon, a species listed on Annex II of the E.U. Habitats Directive. The rivers and lakes, and especially the Bealnabrack system, provide high quality spawning and nursery rivers.

Arctic Char has been recorded in Derryneen Lough and Lough Shindilla. However, only in Lough Shindilla are there recent records for this species. This fish species is listed in the Irish Red Data Book as being threatened in Ireland. The Irish Hare has been recorded from the site and is probably widespread; this endemic subspecies is also listed in the Red Data Book as being threatened. Common Frog, also a Red Data Book species, breeds on the site.

Bird species recorded from the site include Dipper, Heron, Kestrel, Meadow Pipit, Raven, Snipe, Stonechat, Wheatear and Woodcock. Peregrine, a species listed on Annex I of the E.U. Birds Directive, occurs within the site.

The main damaging activities and threats to the Maumturk Mountains are over-grazing, peat cutting and afforestation. Grazing, in particular by sheep, is widespread and quite severe within the site. This has resulted in the erosion of both lowland and mountain blanket bog, and in the modification and destruction of heath communities, particularly in the southern half of the site. Peat cutting, both by hand and by machine, has become more of a problem in recent years but is largely confined to areas of deep, lowland blanket bog. The above activities are the most extensive, but other threats and potentially damaging activities include land drainage and reclamation, fertilization, quarrying and dumping.

This site is of conservation interest as it is a good example of an extensive mountain landscape, containing blanket bog, large areas of heath, siliceous rocky vegetation, oligotrophic lakes and upland grassland. The areas of blanket bog at Teernakill and Caher are largely unaffected by over-grazing and are in very good condition. The presence of rare and protected plant species and of the scarce Arctic Char adds to the interest of the site.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
- Northern Atlantic wet heaths with Erica tetralix [4010] **R**
- Alpine and Boreal heaths [4060] **R**
- Blanket bogs (* if active bog) [7130] **R**
- Depressions on peat substrates of the Rhynchosporion [7150] **R**
- Siliceous rocky slopes with chasmophytic vegetation [8220] **R**
- Salmo salar (Salmon) [1106] **M**

- Najas flexilis (Slender Naiad) [1833] **M**

Qualifying Interests Feature: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Maintain maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain/restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Maintain/restore appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain/restore appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain/restore appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain/restore appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110.

Qualifying Interests Feature: Northern Atlantic wet heaths with Erica tetralix [4010] **R**
Conservation Objective: To restore the favourable conservation condition of Northern Atlantic wet heaths with Erica tetralix in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: cross-leaved heath - Cross-leaved heath (Erica tetralix) present within a 20m radius of each monitoring stop.
Vegetation composition: positive indicator species - Cover of positive indicator species at least 50%.
Vegetation composition: lichens and bryophytes - Total cover of Cladonia and Sphagnum species, Racomitrium lanuginosum and pleurocarpous mosses at least 10%.
Vegetation composition: ericoid species and crowberry - Cover of ericoid species and crowberry (Empetrum nigrum) at least 15%.
Vegetation composition: dwarf shrub species - Cover of dwarf shrubs less than 75%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Alpine and Boreal heaths [4060] **R**
Conservation Objective: To restore the favourable conservation condition of Alpine and Boreal heaths in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.

Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: lichens and bryophytes - Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three.
Vegetation composition: positive indicator species - Cover of positive indicator species at least 66%.
Vegetation composition: dwarf shrub species - Cover of dwarf shrub species at least 10%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 10%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation structure: signs of grazing - Less than 10% collectively of the live leaves of specific graminoids showing signs of grazing.
Vegetation structure: signs of browsing - Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry (Empetrum nigrum) showing signs of browsing.
Vegetation structure: burning - No signs of burning within the habitat.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat.

Qualifying Interests Feature: Blanket bogs (* if active bog) [7130] **R**
Conservation Objective: To restore the favourable conservation condition of Blanket bogs (* if active bog) in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Ecosystem function: peat formation - At least 99% of the total Annex I blanket bog area is active.
Ecosystem function: hydrology - Natural hydrology unaffected by drains and erosion.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: positive indicator species - Number of positive indicator species present at each monitoring stop is at least seven.
Vegetation composition: lichens and bryophytes - Cover of bryophytes or lichens, excluding Sphagnum fallax, at least 10%.
Vegetation composition: potential dominant species - Cover of each of the potential dominant species less than 75%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.

Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: erosion - Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat.

Qualifying Interests Feature: Depressions on peat substrates of the Rhynchosporion [7150] **R**
Conservation Objective: To restore the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - Number of positive indicator species at each monitoring stop is at least five.
Vegetation composition: Rhynchospora spp. - Total cover of white beaked sedge (Rhynchospora alba) and brown beaked sedge (R. fusca) at least 10%.
Vegetation composition: potential dominant species - Cover of each of the potential dominant species individually less than 35%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%.

Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: erosion - Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Siliceous rocky slopes with chasmophytic vegetation [8220] **R**
Conservation Objective: To restore the favourable conservation condition of Siliceous rocky slopes with chasmophytic vegetation in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - At least one positive indicator species present in vicinity of each monitoring stop.
Vegetation composition: non-native species - Proportion of vegetation composed of non-native species less than 1%.
Vegetation composition: bracken, native trees and shrubs - Total cover of bracken (Pteridium aquilinum), native trees and shrubs less than 25%.
Vegetation structure: grazing and browsing - Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat.

Qualifying Interests Feature: Salmo salar (Salmon) [1106] **M**
Conservation Objective: To maintain the favourable conservation condition of Atlantic Salmon in Maumturk Mountains SAC

Attributes & Targets:
Distribution: extent of anadromy - 100% of river channels down to second order accessible from estuary.
Adult spawning fish - Conservation limit (CL) for each system consistently exceeded.
Salmon fry abundance - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling.
Out-migrating smolt abundance - No significant decline.

Number and distribution of redds - No decline in number and distribution of spawning redds due to anthropogenic causes.
Water quality - At least Q4 at all sites sampled by EPA.

Qualifying Interests Feature: Najas flexilis (Slender Naiad) [1833] **M**
Conservation Objective: To maintain the favourable conservation condition of Slender Naiad in Maumturk Mountains SAC

Attributes & Targets:
Population extent - No change to the spatial extent of Najas flexilis within Loughs Lehanagh and Derryneen, subject to natural processes.
Population depth - No change to the depth range of Najas flexilis within each lake, subject to natural processes.
Population viability - No decline in plant fitness, subject to natural processes.
Population abundance - No change to the cover abundance of Najas flexilis, subject to natural processes.
Species distribution - No decline, subject to natural processes.
Habitat extent - No decline, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat for the species.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the populations of the species.
Water quality - Maintain appropriate water quality to support the populations of the species.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the populations of Najas flexilis, subject to natural processes.
Water colour - Maintain appropriate water colour to support the populations of Najas flexilis.
Associated species - Maintain appropriate associated species and vegetation communities to support the populations of Najas flexilis.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the populations of Najas flexilis.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.38.6km to the northwest of the site and salmon migrate via the estuary to/from the Maumturk Mountains. There is no source-pathway-receptor chain for adverse effect on Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae), Northern Atlantic wet heaths with Erica tetralix [4010], Alpine and Boreal heaths [4060], Blanket bogs (* if active bog) [7130], Depressions on peat substrates of the Rhynchosporion [7150] and Siliceous rocky slopes with chasmophytic vegetation [8220].
- Salmo salar (Salmon) [1106] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially

affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the salmon population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M** • Northern Atlantic wet heaths with Erica tetralix [4010] **R** • Alpine and Boreal heaths [4060] **R** • Blanket bogs (* if active bog) [7130] **R** • Depressions on peat substrates of the Rhynchosporion [7150] **R** • Siliceous rocky slopes with chasmophytic vegetation [8220] **R**	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae), Northern Atlantic wet heaths with Erica tetralix [4010], Alpine and Boreal heaths [4060], Blanket bogs (* if active bog) [7130], Depressions on peat substrates of the Rhynchosporion [7150], Siliceous rocky slopes with chasmophytic vegetation [8220] and Najas flexilis (Slender Naiad) [1833] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>**
Qualifying Interests (QI): Species • Najas flexilis (Slender Naiad) [1833] **M** • Salmo salar (Salmon) [1106] **M**	The risk to Salmo salar (Salmon) [1106] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Salmon associated with construction and operational activities applies. **<u>Mitigation required</u>**

9. AA Summary Matrix for Connemara Bog Complex SAC (002034)

Connemara Bog Complex SAC (002034) is located c.13.3km to the northwest of the site.
Connemara Bog Complex SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, the Connemara Bog Complex SAC is a large site encompassing the majority of the south Connemara lowlands in Co. Galway. The site is bounded to the north by the Galway–Clifden road and stretches as far east as the Moycullen–Spiddal road. The site supports a wide range of habitats, including extensive tracts of western blanket bog, which form the core interest, as well as areas of heath, fen, woodlands, lakes, rivers and coastal habitats.

The site is underlain predominantly by various Galway granites, with small areas along the northern boundary of Lakes Marble, schist and gneiss. The Roundstone Bog area has a diverse bedrock geology composed mainly of the basic intrusive rock, gabbro. An area of rock, possibly Cambrian in age, called the Delaney Dome Formation occurs in the north-west of this area. Gabbro also occurs in the Kilkieran peninsula and near Cashel. The whole area was glaciated in the last Ice Age which scoured the lowlands of Connemara.

The Connemara Bog Complex is characterized by areas of deep peat surrounded by rocky granite outcrops covered by heath vegetation. However, the main habitat within this site is lowland Atlantic blanket bog, as most of the area is covered by blanket peat greater than 1 m in depth. A mosaic of different communities exists in association with the blanket bog, including hummock/hollow systems, interconnecting bog pools, flushes, transition and quaking mires, freshwater marshes, lakeshore, lake and river systems. The key plant species of lowland blanket bog are Black Bog-rush (Schoenus nigricans), Purple Moor-grass (Molinia caerulea), Crossleaved Heath (Erica tetralix), Deergrass (Scirpus cespitosus), Common Cottongrass (Eriophorum angustifolium), Bog Asphodel (Narthecium ossifragum), White Beak-sedge (Rhynchospora alba) and bog moss species (Sphagnum spp.). Rhynchosporion vegetation is found on the blanket bog by lake and pool margins, in wet hollows and in quaking areas. Species such as White Beak-sedge, Common Cottongrass, Bogbean (Menyanthes trifoliata), sundews (Drosera spp.) and bog mosses are common. Areas of wet heath are widespread throughout this site, where blanket peat becomes shallower. There is a limited amount of dry heath, with species such as Western Gorse (Ulex gallii), St. Dabeoc's Heath (Daboecia cantabrica) and Bell Heather (Erica cinerea) recorded.

Both oligotrophic and dystrophic lakes are found within Connemara Bog Complex SAC, with the greatest concentration in the west of the site. The latter type are generally smaller, have a mainly peaty bottom and there is generally an abrupt transition from blanket bog to open water. Oligotrophic lakes in this site typically have shallow margins, with a mixed rocky/peaty bottom. Typical plant species of the lake edges include Water Lobelia (Lobelia dortmanna), Pipewort (Eriocaulon aquaticum), Shoreweed (Littorella uniflora), Many-stalked Spike-rush (Eleocharis multicaulis) and Bulbous Rush (Juncus bulbosus). The rare species Slender Naiad

(Najas flexilis) and Pillwort (Pilularia globulifera) have both been recorded from oligotrophic lakes at this site. Species commonly encountered in dystrophic lakes/pools include the bog mosses Sphagnum auriculatum var. auriculatum and S. cuspidatum, along with White Beak-sedge, Lesser Bladderwort (Utricularia minor), Pipewort and Bogbean.

The main river systems within the site are the Owenmore (Ballynahinch) river, the Glashanasmearany and Derrygauna rivers (to the south of Lough Bofin), the Cashla river (which flows out of Glenicmurrin Lough), the Glengawbeg river (which connects Lough Agraffard and Lettercraffoe Lough) and the Owenboliska river and its tributaries (north of Spiddal). Vegetation associated with some of these waterways includes Alternate Water-milfoil (Myriophyllum alternifolium), Bulbous Rush, Floating Club-rush (Scirpus fluitans), water-lilies, Great Fen-sedge (Cladium mariscus), Bog Pondweed (Potamogeton polygonifolius), Broad-leaved Pondweed (P. natans), Water Horsetail (Equisetum fluviatile) and the liverwort Scapania undulata.

Within this site, areas of transition mire occur mainly along the margins of lakes and bog streams. The surface of such areas is typically quaking and there is often evidence of base-enrichment. Typical plant species include Bog-sedge (Carex limosa), Slender Sedge (C. lasiocarpa), Bog Pondweed, Bogbean, Blunt-flowered Rush (Juncus subnodulosus), Common Cottongrass, Purple Moor-grass and White Beak-sedge. Locally there may be some Great Fen-sedge or Black Bog-rush. The rare and legally protected species Slender Cottongrass (Eriophorum gracile) occurs in this habitat. Moss cover is variable.

Areas of Molinia meadow at this site contain species such as Purple Moor-grass, Meadow Thistle (Cirsium dissectum), Sharp-flowered Rush (Juncus acutiflorus) and Tormentil (Potentilla erecta). The community occurs on wet acid soils.

There are a number of areas of old oak woodland, but the woodland at Shannawoneen, north of Spiddal, is the best known. This woodland lies in the valley of the Owenboliska river. It provides a good example of a Sessile Oak (Quercus petraea) dominated canopy woodland, although there is also a lot of Downy Birch (Betula pubescens). Other examples of this habitat at the site are found at Ballynahinch, Glendollagh, Derrywaking Lake, as well as on some of the lake islands. The invasive alien shrub Rhododendron (Rhododendron ponticum) is found in some areas of woodland.

There are some limited, but nonetheless well developed, examples of alkaline fen at this site. These fens are often species-rich, and support species not typically found in association with blanket bog areas - e.g. Dioecious Sedge (C. dioica), Black Bog-rush, Broad-leaved Cottongrass (E. latifolium), the moss Campylium stellatum and Lesser Clubmoss (Selaginella selaginoides).

Four main lagoons occur within this site: Lough Ahalia, Doire Bhanbh, Lough Aconeera and Salt Lake. All four are regarded as saline lake lagoons and they range in size from 1–90 ha. The smallest (Doire Bhanbh) is quite shallow and surrounded by Common Reed (Phragmites australis) swamp, while the three larger lagoons are relatively deep and are surrounded by moorland and exposed

granite. Salt Lake contains a serpulid worm reef. Lough Ahalia consists of a series of basins, and these are deep in places, with an unusual salinity structure. The lowest lake is relatively shallow (0–4 m) and brackish throughout, while the middle lake is deep (13 m) and permanently stratified, with water below 3 m depth measuring 14 ppt. The flora and fauna of this lagoon system are extremely diverse, with many communities found. This, along with Lough Aconeera, is the only known site in Ireland for the Red Data Book stonewort Chara balthica. Another Red Data Book plant, Lamprothamnium papulosum, also occurs, as well as Chara aspera and C. virgata. An unusual form of Fennel Pondweed (Potamogeton pectinatus) occurs in high salinity water. There are a number of other notable records of plant and animal from this lagoon. Lough Aconeera is less remarkable in terms of flora and fauna, but nonetheless supports a sizeable number of lagoonal specialists.

Nine species protected under the Flora (Protection) Order, 2015, occur within this site: Forked Spleenwort (Asplenium septentrionale), Parsley Fern (Cryptogramma crispa), Bog Hair-grass (Deschampsia setacea), Slender Cottongrass, Bog Orchid (Hammarbya paludosa), Slender Naiad, Heath Cudweed (Omalotheca sylvatica), Pillwort and Pale Dog-violet (Viola lactea). Rare and threatened species such as Dorset Heath (Erica ciliaris), Mackay's Heath (Erica mackaiana) and Green-winged Orchid (Orchis morio) also occur within this site. All of the above species are listed in the Irish Red Data Book, and Slender Naiad is listed on Annex II of the E.U. Habitats Directive.

The Annex II butterfly species, Marsh Fritillary, is known to occur at this site.

Atlantic Salmon, a species listed under Annex II of the E.U. Habitats Directive, occurs in many of the rivers within the site. The Cashla and Ballynahinch systems are good examples of western acidic spate rivers which support the species. Good spawning and nursery grounds for the species occur in these systems. Arctic Char occurs in a number of lakes within the site: Ballynahinch Lake, Glenicmurrin Lough and Lough Shindilla. The species has also been reported from Lough Oorid and Lough Glendollagh in the past, but has not been recorded from these lakes in recent years. Arctic Char is listed as threatened in the Irish Red Data Book.

Otter have been recorded as occurring in the Connemara Bog Complex. Irish Hare, another mammal listed in the Red Data Book, occurs on the site. Common Frog breeds on the site.

The site is of national importance for wintering populations of Greenland White-fronted Goose. Small flocks (up to 30) are found on Roundstone Bog and also use the bogs between Recess and Maam Cross. In April 1989 a synchronised ground and air census of the Connemara bogs located 7 flocks of Greenland White-fronted Goose, totalling 134–137 birds. In 1991/93 wintering numbers were considered to be approximately 60 birds.

There is an internationally important breeding area for Cormorants at Lough Scannive with 218 pairs present in 1985 in a colony which is known to have existed pre-1968. Golden Plover, a species listed on Annex I of the E.U. Birds Directive, nests at up to four locations in the site, with a maximum of two pairs

noted at any one location. Another Annex I species known to be present in the site is Merlin. Lough Naskanniva is an important inland breeding site for Common Terns (up to 60 pairs in 1977 and 1992) and Choughs, both of which are also Annex I species under the E.U. Birds Directive.

The main damaging operations and threats in the Connemara Bog Complex are peat cutting, over-grazing and afforestation. Extensive peat extraction using 'Difco' machines has become common in the region in recent years, and cutting by excavator and hopper is also increasing. The hand-cutting of peat is less threatening as it is usually on a much smaller scale, but nonetheless it should be controlled within the site. Over-grazing and poaching by sheep and cattle is a widespread problem within the site, with erosion of peat ensuing. The above operations are the most extensive but other threats and potentially damaging operations include land drainage and reclamation, fertilization, quarrying and dumping.

In summary, the Connemara Bog Complex encompasses a large area of relatively undamaged lowland Atlantic blanket bog of high conservation significance both in Ireland and at a European level. The site also contains good examples of at least 13 other habitats listed on Annex I of the E.U. Habitats Directive, as well as four species listed in Annex II. Further, the site supports a number of threatened and protected plant species. The site is internationally important for Cormorant and nationally important for Greenland White-fronted Goose, and contains nesting sites for Golden Plover

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Coastal lagoons [1150] **M**
- Reefs [1170] **M**
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M**
- Natural dystrophic lakes and ponds [3160] **M**
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
- Northern Atlantic wet heaths with Erica tetralix [4010] **R**
- European dry heaths [4030] **R**
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
- Blanket bogs (* if active bog) [7130] **R**
- Transition mires and quaking bogs [7140] **R**
- Depressions on peat substrates of the Rhynchosporion [7150] **R**
- Alkaline fens [7230] **R**
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M**

- Euphydryas aurinia (Marsh Fritillary) [1065] **M**
- Salmo salar (Salmon) [1106] **R**
- Lutra lutra (Otter) [1355] **M**
- Najas flexilis (Slender Naiad) [1833] **M**

Qualifying Interests Feature: Coastal lagoons [1150] **M**
Conservation Objective: To maintain the favourable conservation condition of Coastal lagoons in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: Chlorophyll *a* - Annual median chlorophyll a within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges and less than 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to at least 4m depth.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Serpula vermicularisdominated community complex, subject to natural processes.
Community structure - Conserve the high quality of the Serpula vermicularis-dominated community complex, subject to natural processes.
Community structure - Conserve the following community type in a natural condition: Intertidal reef community complex.

Qualifying Interests Feature: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Maumturk Mountains SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Maintain maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain/restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Maintain appropriate water quality to support the habitat, including high chlorophyll status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain/restore appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110.

Qualifying Interests Feature: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M**
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Maintain maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/ absent attached algal biomass (< 5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130.

Qualifying Interests Feature: Natural dystrophic lakes and ponds [3160] **M**
Conservation Objective: To maintain the favourable conservation condition of Natural dystrophic lakes and ponds in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - Maintain maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.

Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/ absent attached algal biomass (< 5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3160.

Qualifying Interests Feature: Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
Conservation Objective: To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime: river flow - Maintain appropriate hydrological regimes.
Hydrological regime: groundwater discharge - Maintain appropriate hydrological regimes.
Substratum composition: particle size range - Maintain appropriate substratum particle size range, quantity and quality, subject to natural processes.
Water quality - Maintain appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Typical species of the relevant habitat sub-type should be present and in good condition.
Floodplain connectivity: area - Area of active floodplain at, and upstream of the habitat, necessary to support all sub-types of the habitat, should be maintained.
Riparian habitat: area - Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types.

Qualifying Interests Feature: Northern Atlantic wet heaths with Erica tetralix [4010] **R**
Conservation Objective: To restore the favourable conservation condition of Northern Atlantic wet heaths with Erica tetralix in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: cross-leaved heath - Presence of cross-leaved heath (Erica tetralix) near each monitoring stop.
Vegetation composition: positive indicator species - Cover of positive indicator species at least 50%.
Vegetation composition: lichens and bryophytes - Total cover of Cladonia and Sphagnum species, Racomitrium lanuginosum and pleurocarpous mosses at least 10%.
Vegetation composition: ericoid species and crowberry - Cover of ericoid species and crowberry (Empetrum nigrum) at least 15%.
Vegetation composition: dwarf shrub species - Cover of dwarf shrubs less than 75%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: European dry heaths [4030] **R**
Conservation Objective: To restore the favourable conservation condition of European dry heaths in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.

Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: lichens and bryophytes - Number of bryophyte or non-crustose lichen species present at each monitoring stop is least three, excluding Campylopus and Polytrichum mosses.
Vegetation composition: number of positive indicator species - Number of positive indicator species present at each monitoring stop is at least two.
Vegetation composition: cover of positive indicator species - Cover of positive indicator species at least 50% for siliceous dry heath and 50- 75% for calcareous dry heath.
Vegetation structure: dwarf shrub composition - Proportion of dwarf shrub cover composed collectively of bog-myrtle (Myrica gale), creeping willow (Salix repens) and western gorse (Ulex gallii) is less than 50%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: senescent ling - Senescent proportion of ling (Calluna vulgaris) cover less than 50%.
Vegetation structure: signs of browsing - Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing.
Vegetation structure: burning - No signs of burning in sensitive areas.
Vegetation structure: growth phases of ling - Outside sensitive areas, all growth phases of ling should occur throughout, with at least 10% of cover in the mature phase.
Vegetation structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat.

Qualifying Interests Feature: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
Conservation Objective: To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.

Vegetation composition: typical species - At least seven positive indicator species present, including one "high quality" species as listed in O'Neill et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: moss species - Hair mosses (Polytrichum spp.) not more than 25% cover.
Vegetation structure: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 10 and 80cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare ground - Not more than 10% bare ground.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Blanket bogs (* if active bog) [7130] **R**
Conservation Objective: To restore the favourable conservation condition of Blanket bogs in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Ecosystem function: peat formation - At least 99% of the total Annex I blanket bog area is active.
Ecosystem function: hydrology - Natural hydrology unaffected by drains and erosion.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: positive indicator species - Number of positive indicator species present at each monitoring stop is at least seven.
Vegetation composition: lichens and bryophytes - Cover of bryophytes or lichens, excluding Sphagnum fallax, at least 10%.
Vegetation composition: potential dominant species - Cover of each of the potential dominant species less than 75%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 10%.

Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: erosion - Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat.

Qualifying Interests Feature: Transition mires and quaking bogs [7140] **R**
Conservation Objective: To restore the favourable conservation condition of Transition mires and quaking bogs in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline from current distribution, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: number of positive indicator species - Number of positive indicator species at least three for in-filling pools and flushes and at least six for fens.
Vegetation composition: number of core positive indicator species - At least one core positive indicator species present.
Vegetation composition: cover of positive indicator species - Total cover of positive indicator species is at least 25%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation structure: height - Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Depressions on peat substrates of the Rhynchosporion [7150] **R**
Conservation Objective: To restore the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - Number of positive indicator species at each monitoring stop is at least five.
Vegetation composition: Rhynchospora spp. - Total cover of white beaked sedge (Rhynchospora alba) and brown beaked sedge (R. fusca) at least 10%.
Vegetation composition: potential dominant species - Cover of each of the potential dominant species less than 35%.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and scrub - Cover of scattered native trees and shrubs less than 10%.
Vegetation structure: Sphagnum condition - Less than 10% of the Sphagnum cover is crushed, broken and/or pulled up.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids, crowberry (Empetrum nigrum) and bog-myrtle (Myrica gale) showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: erosion - Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.

Qualifying Interests Feature: Alkaline fens [7230] **R**
Conservation Objective: To restore the favourable conservation condition of Alkaline fens in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.

Ecosystem function: soil nutrients - Maintain soil nutrient status within natural range.
Community diversity - Maintain variety of vegetation communities, subject to natural processes.
Vegetation composition: number of positive indicator species (brown mosses) - Number of brown moss species present at each monitoring stop is at least one.
Vegetation composition: number of positive indicator species (vascular plants) - Number of positive vascular plant indicator species present at each monitoring stop is at least two for small-sedge flushes and at least three for black bog-rush (Schoenus nigricans) flush and bottle sedge (Carex rostrata) fen.
Vegetation composition: cover of positive indicator species - Total cover of brown moss species and positive vascular plant indicator species at least 20% for small-sedge flushes and at least 75% cover for black bog-rush (Schoenus nigricans) flush and bottle sedge (Carex rostrata) fen.
Vegetation composition: negative indicator species - Total cover of negative indicator species less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Vegetation composition: soft rush and common reed cover - Total cover of soft rush (Juncus effusus) and common reed (Phragmites australis) less than 10%.
Vegetation structure: height - Proportion of live leaves and/or flowering shoots of vascular plants that are more than 5cm above the ground surface should be at least 50%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.
Physical structure: drainage - Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
Physical structure: tufa formations - Disturbed proportion of vegetation cover is less than 1%.
Indicators of local distinctiveness - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat

Qualifying Interests Feature: Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M**
Conservation Objective: To maintain the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in Connemara Bog Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Woodland size - Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size.
Woodland structure: cover and height - Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semimature trees and shrubs; and well-developed herb layer.

Woodland structure: community diversity and extent - Maintain diversity and extent of community types.
Woodland structure: natural regeneration - Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.
Woodland structure: dead wood - At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter.
Woodland structure: veteran trees - No decline.
Woodland structure: indicators of local distinctiveness - No decline.
Vegetation composition: native tree cover - No decline. Native tree cover not less than 95%.
Vegetation composition: typical species - A variety of typical native species present, depending on woodland type, including oak (Quercus petraea) and birch (Betula pubescens).
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.

Qualifying Interests Feature: Euphydryas aurinia (Marsh Fritillary) [1065] **M**
Conservation Objective: To maintain the favourable conservation condition of Euphydryas aurinia (Marsh Fritillary) in Connemara Bog Complex SAC

Attributes & Targets:
Distribution - No decline, subject to natural processes.
Proof of breeding: larval webs - Proof of breeding, confirmed by detection of webs.
Potential habitat: area - Area of potential habitat stable or increasing, subject to natural processes.

Qualifying Interests Feature: Salmo salar (Salmon) [1106] **R**
Conservation Objective: To restore the favourable conservation condition of Salmo salar (Salmon) in Connemara Bog Complex SAC

Attributes & Targets:
Distribution - 100% of river channels down to second order accessible from estuary.
Adult spawning fish - Conservation Limit (CL) for each system consistently exceeded.
Salmon fry abundance - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling.
Out-migrating smolt abundance - No significant decline.
Number and distribution of redds - No decline in number and distribution of spawning redds due to anthropogenic causes.
Water quality - At least Q4 at all sites sampled by EPA.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **M**
Conservation Objective: To maintain the favourable conservation condition of Lutra lutra (Otter) in Connemara Bog Complex SAC

Attributes & Targets:
Distribution – No significant decline.
Extent of terrestrial habitat - No significant decline. Area mapped and calculated as 2194.8ha
Extent of marine habitat - No significant decline. Area mapped and calculated as 139.0ha.
Extent of freshwater (river) habitat - No significant decline. Length mapped and calculated as 564.0km.
Extent of freshwater (lake/lagoon) habitat - No significant decline. Area mapped and calculated as 3908.6ha.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.

Qualifying Interests Feature: Najas flexilis (Slender Naiad) [1833] **M**
Conservation Objective: To maintain the favourable conservation condition of Najas flexilis (Slender Naiad) in Connemara Bog Complex SAC

Attributes & Targets:
Population extent - No change to the spatial extent of Najas flexilis within each lake, subject to natural processes.
Population depth - No change to the depth range of Najas flexilis within each lake, subject to natural processes.
Population viability - No decline in plant fitness, subject to natural processes.
Population abundance - No change to the cover abundance of Najas flexilis, subject to natural processes.
Species distribution - No decline, subject to natural processes.
Habitat extent - No decline, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat for the species.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the populations of the species.
Water quality - Maintain appropriate water quality to support the populations of the species.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the populations of Najas flexilis, subject to natural processes.
Water colour - Maintain appropriate water colour to support the populations of Najas flexilis.
Associated species - Maintain appropriate associated species and vegetation communities to support the populations of Najas flexilis.
Fringing habitat: area - Maintain the area and condition of fringing habitats necessary to support the populations of Najas flexilis.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.13.3km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Coastal lagoons [1150], Reefs [1170], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Natural dystrophic lakes and ponds [3160], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], Northern Atlantic wet heaths with Erica tetralix [4010], European dry heaths [4030], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], Depressions on peat substrates of the Rhynchosporion [7150], Alkaline fens [7230], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Euphydryas aurinia (Marsh Fritillary) [1065], Salmo salar (Salmon) [1106] and Najas flexilis (Slender Naiad) [1833].
- Lutra lutra (Otter) [1355] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the otter population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Coastal lagoons [1150] **M** • Reefs [1170] **M** • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M** • Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M** • Natural dystrophic lakes and ponds [3160] **M** • Water courses of plain to montane levels with the Ranunculion fluitantis and	Coastal lagoons [1150], Reefs [1170], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Natural dystrophic lakes and ponds [3160], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], Northern Atlantic wet heaths with Erica tetralix [4010], European dry heaths [4030], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], Depressions

Callitricho-Batrachion vegetation [3260] **M** • Northern Atlantic wet heaths with Erica tetralix [4010] **R** • European dry heaths [4030] **R** • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M** • Blanket bogs (* if active bog) [7130] **R** • Transition mires and quaking bogs [7140] **R** • Depressions on peat substrates of the Rhynchosporion [7150] **R** • Alkaline fens [7230] **R** • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M** **Qualifying Interests (QI): Species** • Euphydryas aurinia (Marsh Fritillary) [1065] **M** • Salmo salar (Salmon) [1106] **R** • Lutra lutra (Otter) [1355] **M** • Najas flexilis (Slender Naiad) [1833] **M**	on peat substrates of the Rhynchosporion [7150], Alkaline fens [7230], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Euphydryas aurinia (Marsh Fritillary) [1065], Salmo salar (Salmon) [1106] and Najas flexilis (Slender Naiad) [1833] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required** The risk to Lutra lutra (Otter) [1355] applies based on the hydrological link and water quality deterioration from pre-construction and construction activities potentially affecting fish. The risk of disturbance effects on Otter associated with construction and operational activities applies. **Mitigation required**

10. AA Summary Matrix for Kilkieran Bay and Islands SAC (002111)

Kilkieran Bay and Islands SAC (002111) is located c.36.6km to the west of the site.
Kilkieran Bay and Islands SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, Kilkieran Bay and Islands SAC is located just north of Galway Bay and extends from Keeraun Point, south of Carraroe, westwards to Mace Head, west of Carna, all in Co. Galway. The site contains a large area of open marine water, many islands and rocky islets, and the coastline is much indented with a series of bays (notably the interconnected Kilkieran Bay and Greatman's Bay), channels and inlets. The entrances of the bays face the prevailing south-westerly winds and they are subject to strong tidal streams as the sea funnels between islands and through channels. A number of streams, lakes and lagoons drain into the bays. The

bedrock of the site is igneous, composed of granite, felsite and other intrusive rocks rich in silica. Generally, the site has a rocky shoreline which in most places gives way to mud in shallow water. The surrounding land is dominated by lowland blanket bog, with rock outcrops and small hills to the north.

The marine habitats found within Kilkieran Bay and Greatman's Bay are of very high conservation value. Both bays have a wide variety of habitats and Kilkieran Bay has a very high diversity of marine species (only Kenmare River is more diverse than Kilkieran Bay, according to studies thus far carried out). A high number of species that are rare or considered to be worthy of conservation in Ireland occur in the area.

Communities of particular importance are the extensive and varied beds of freeliving red calcareous algae or maerl (which may be known locally as 'coral'). Kilkieran Bay is one of three known localities in Ireland where the maerl species Lithothamnion corallioides, Lithophyllum dentatum and Lithothamnion fasciculatum cooccur. The range of maerl deposits in Kilkieran Bay, including banks of maerl debris, live maerl and mixtures of maerl, gravel and mud gives rise to a variety of communities. Within these communities are a number of rare anemones, e.g. Scolanthus callimorphus, Mesacmaea mitchellii and Aureliania heterocera. The last-named species is rare in Ireland, being known only from Donegal Bay and Kilkieran Bay, as well as a small number of areas on the north-east coast. The population in this site is the largest on the west coast. Kilkieran Bay is the only known Irish locality for the anemone Mesacmaea mitchellii. Scolanthus callimorphus, another anemone species, is known only from Kilkieran Bay, Valencia Harbour in Co. Kerry and the Dorset coast in the U.K. The best recorded example of the community characterised by the sea cucumber Neopentadactyla mixta occurs in the banks of dead maerl of Kilkieran Bay. The very rare anemone Halcampoides elongatus, known only from Kilkeran Bay and Ards Bay in Ireland, occurs in a narrow bed of clean dead maerl at the edges of some of the live maerl beds. Greatman's Bay, like Kilkieran Bay, has extensive maerl beds. A population of the large burrowing anemone Pachycerianthus multiplicatus occurs at two muddy sites within Kilkieran Bay and is known from only three other localities in Ireland. The seagrass Zostera marina occurs in a number of areas in Kilkieran Bay and in some areas co-occurs with maerl. This association is known from a number of areas in Ireland but has not been recorded in the U.K. Beds of the native oyster Ostrea edulis occur in Inner Kilkieran Bay. The outer part of the site has sandy bays, e.g. Mweenish Bay, which support populations of polychaetes, burrowing anemones and bivalves. Sheltered shores have a variety of communities down the shore, with the lower shore generally being species-rich and supporting a variety of polychaetes and bivalves.

The rocky shores of the site are comprised of bedrock or a mixture of bedrock, boulders and gravel; they support a very wide variety of shore communities, with the zonation being typical of shores that range from being exposed to wave action through to extremely sheltered shores and some tide-swept shores. Shores exposed to wave action have a zonation of Channel Wrack (Pelvetia canaliculata) and barnacles in the upper shore, Bladder Wrack (Fucus vesiculosus) and barnacles in the mid shore, Serrated Wrack (Fucus serratus) in the low shore and the kelp Laminaria hyperborea on the very low shore. Sheltered shores have the

mid shore dominated by Knotted Wrack (Ascophyllum nodosum). In the inner part of both bays the brown alga Ascophyllum nodosum var. mackii, which has very specific habitat requirements, is found. The rapids at Carrickaglegaun Bridge, Lettermore Island, are extremely species-rich (119 species recorded) and include the rarely-recorded star fish Asterina phylactica. This represents the highest number of species recorded on any shore in a recent Irish survey. The inner parts of Kilkieran Bay have channels to several extensive lagoons.

Mixed kelp forests of Laminaria hyperborea and Laminaria saccharina frequently form a canopy in the very sheltered areas. In contrast, in exposed situations there are extensive areas of Laminaria hyperborea, in particular to the south of Golam Head. The rare alga Dermocorymus montagnei is known only from the very sheltered narrow inlet Coill Saile on the northern shore of Kilkieran Bay and a handful of sites in Brittany, France. Also in this creek are large plants of the maerl species Phymatolithon polymorphum on which the rare, creeping red alga Gelidiella calcicola and the recently described Gelidium maggsiae occur. The creek is also unusual for its large population of the red alga Meredithia microphylla, which is more characteristic of exposed areas, and for the large form of the sea slug Akera bullata var. farrani.

In Kilkieran Bay, on subtidal reefs dominated by animals, the sponge/sea squirt community of Raspailia ramosa and Corella parallelogramma is widespread; the best examples in Ireland of this community occur in Gurraig Sound within the site, where a high diversity of encrusting and branching sponges and ascidians are found. The rare sponges Plakortis simplex and Tricheurypon viride are found in this community. In more exposed situations such as the Namackan Rocks there are good examples of the Axinellid sponge community with the sea fan Eunicella verrucosa. The sponge Axinella damicornis occurs here and although it is found at ten locations on the west coast it is never abundant. Phakellia vermiculata, a deep-water species, has been recorded in shallow water at only a limited number of locations on the south-west and west coasts of Ireland.

The site is extremely important for the number of lagoons that it includes - it is considered to be one of the best sites in the country for this habitat and provides an excellent example of a particularly unusual type of saline lake lagoon situated on peat. This habitat type appears to be rare in Europe but characteristic of south Connemara. Examples of lagoons in the site include Lettermullen Pool, Lough Tanai, Mill Lough, Carafinla Lough, the Lough Fhada complex and Loch an Aibhnín.

Taking one lagoon as an example, Lettermullen Pool is approximately 1 ha in size, and represents a particularly good example of a rock lagoon lying on granite. Salinity is generally high, but freshwater is received from a small stream and from several small groundwater springs at the edges. The vegetation comprises an interesting community of Spiral Tasselweed (Ruppia cirrhosa) and the stonewort Lamprothamnion papulosum (both of which are lagoonal specialists), along with Eelgrass (Zostera marina) and small amounts of red algae. This community is found only in south Connemara. The fauna is rich, particularly for such a small lagoon, with 52 taxa recorded from a wide range of ecological groups, with five lagoonal specialists.

Areas of saltmarsh occur frequently throughout the site - a thin fringe of saltmarsh is found along most stretches of coastline. The habitat occurs most frequently in the many sheltered bays in the eastern half of the site and has developed in the lee of causeways built to connect islands to the mainland, e.g. Gorumna Island. The area of saltmarsh between Costelloe and Kinvara is particularly well-developed and extensive. The saltmarshes in the site are of the fringe type and most occur on peat. Although there are a large number of discrete and often narrow areas, taken together the habitat within the site is likely to be one of the largest areas of saltmarsh on peat in the country. The saltmarshes on the site include both the Atlantic and Mediterranean types, but low-growing Atlantic salt meadow appears to be the most common. The vegetation is typically dominated by various mixtures of species such as Thrift (Armeria maritima), Red Fescue (Festuca rubra), Common Saltmarsh-grass (Puccinellia maritima), Creeping Bent (Agrostis stolonifera), Sea Plantain (Plantago maritima), Buck's-horn Plantain (P. coronopus) and Sea Aster (Aster tripolium). Stands of Sea Rush (Juncus maritimus) occur in the site, and these correspond to the Mediterranean salt meadow type.

Machair occurs most extensively on Mweenish Island, Finish Island and Mason Island, which lie in the west of the site. These machair areas appear to be the remains of formerly more extensive systems; they are some of the most southerly machair systems in the country and are of conservation value from both vegetational and geomorphological perspectives. Common species include Red Fescue, White Clover (Trifolium repens), Yarrow (Achillea millefolium), Daisy (Bellis perennis), Sand Sedge (Carex arenaria), Bulbous Buttercup (Ranunculus bulbosus), Ribwort Plantain (P. lanceolata), Wild Thyme (Thymus praecox), Common Mouse-ear (Cerastium fontanum), Selfheal (Prunella vulgaris), among others, as well as a number of moss species.

Lowland hay meadows are relatively rare within the site, but some good examples are known. The habitat is most commonly found in small, unimproved fields located behind beaches, which are influenced by blown sand. Perhaps the most extensive area of the habitat is to be found at Ardmore Point. The vegetation here is dominated by a species-rich mixture of grasses and low- to medium-sized forbs. A number of relatively rare orchids and other vascular plants have been recorded from this site, including Lesser Butterfly-orchid (Platanthera bifolia), Common Twayblade (Listera ovata) and Autumn Lady's-tresses (Spiranthes spiralis).

The submerged aquatic plant Slender Naiad (Najas flexilis) occurs in several of the coastal freshwater lakes. These are oligotrophic lake systems and include Lough Keeraun, Lough Truskan, Lough Killa and Lough Natawnymore. Slender Naiad is listed on Annex II of the E.U. Habitats Directive and also on the Flora (Protection) Order, 2015.

Otter, a species also listed on Annex II of the E.U. Habitats Directive, occurs commonly throughout the site. The site is used by Common Seal (maximum count of 116 in the all-Ireland survey of 2003). Grey Seal is a regular visitor and may breed.

The islands and islets of Kilkieran Bay, mainly those on its western side, are important for their colonies of seabirds, particularly breeding terns - Arctic Tern (99 pairs recorded in 1995; 308 pairs, 1984), Common Tern (47 pairs, 1995; 371 pairs, 1984), Little Tern (7-9 pairs, 1995; 11 pairs 1984). All of these tern species are listed on Annex I of the E.U. Birds Directive. Inishmuskery, and probably other islands, are used by a population of Barnacle Goose in winter (370 in spring 1994), a species that is also listed on Annex I of the Birds Directive. Eagle Rock is of interest for its population of Black Guillemot (30 individuals, 1984). The site also supports colonies of gulls - Herring Gull (310 individuals, 1994), Great Black-backed Gull (6 individuals, 1984) and Black-headed Gull.

Kilkieran Bay and Islands is an extensive coastal complex site that is of high conservation value, particularly for the fine examples of marine and terrestrial E.U. Habitats Directive Annex I habitats that it supports and for its important Slender Naiad, Otter, seal and seabird populations.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Coastal lagoons [1150] **M**
- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
- Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
- Machairs (* in Ireland) [21A0] **R**
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M**
- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
- Phocoena phocoena (Harbour Porpoise) [1351] **M***
- Lutra lutra (Otter) [1355] **M**
- Phoca vitulina (Harbour Seal) [1365] **M**
- Najas flexilis (Slender Naiad) [1833] **M**

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community type in a natural condition: Intertidal sand with polychaetes community complex.

Qualifying Interests Feature: Coastal lagoons [1150] **M**
Conservation Objective: To maintain the favourable conservation condition of Coastal lagoons in Kilkieran Bay and Islands

Attributes & Targets:
Habitat area - Area stable, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: Chlorophyll *a* - Annual median chlorophyll a within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges and less than 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to at least 2m depth.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera- and maërl-dominated community complexes and the Pachycerianthus multiplicatus-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community complex, subject to natural processes.
Community structure - Conserve the high quality of the maërl-dominated community complex, subject to natural processes.

Community structure - Conserve the high quality of the Pachycerianthus multiplicatus-dominated community, subject to natural processes.
Community distribution - Conserve the following communities in a natural condition: Intertidal sand with polychaetes community complex; Mixed sediment dominated by polychaetes community complex; Sand with nemerteans and crustaceans community complex; Deep water sand dominated by bivalves and polychaetes community complex; Reef communities (as listed under 1170).

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Intertidal reef community complex; Subtidal sponge and ascidian community complex; Exposed to moderately exposed subtidal reef community complex; Deep water faunal crust and sponge community complex; Laminaria-dominated community complex.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
Conservation Objective: To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply - Maintain natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation in the sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with characteristic species listed in SMP (McCorry and Ryle, 2009).

Vegetation structure: negative indicator species - Spartina anglica - There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass.

Qualifying Interests Feature: Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
Conservation Objective: To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply - Maintain the natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation in the sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with characteristic species listed in SMP (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass.

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **R**
Conservation Objective: To restore the favourable conservation condition of Machairs in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including for erosion and succession.
Habitat distribution - No decline or change in habitat distribution.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regimes.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare sand should be present but not more than 5% in total, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.

Vegetation composition: typical species and subcommunities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: bryophytes - Bryophytes should be at least an occasional component of the vegetation.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M***
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea in Kilkieran Bay and Islands SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
Conservation Objective: To maintain the favourable conservation condition of Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 50% of sward between 10cm and 50cm tall.
Vegetation composition: typical species - At least seven positive indicator species present, including one "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species less than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation structure: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5%.
Physical structure: bare soil - Not more than 10% bare soil.

Qualifying Interests Feature: Phocoena phocoena (Harbour Porpoise) [1351] **M***
Conservation Objective: To maintain the favourable conservation condition of Phocoena phocoena (Harbour Porpoise) in Kilkieran Bay and Islands SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **M**
Conservation Objective: To maintain the favourable conservation condition of Lutra lutra (Otter) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Distribution – No significant decline.
Extent of terrestrial habitat - No significant decline. Area mapped and calculated as 316ha above high water mark (HWM); 14ha along river banks/ around ponds.
Extent of marine habitat - No significant decline. Area mapped and calculated as 2996ha.
Extent of freshwater (river) habitat - No significant decline. Length mapped and calculated as 4.4km.
Extent of freshwater (lake/lagoon) habitat - No significant decline. Area mapped and calculated as 24ha.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Lutra lutra (Otter) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve breeding sites in a natural condition.
Moulting behaviour - Conserve moult haul-out sites in a natural condition.
Resting behaviour - Conserve resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the harbour seal population at the site.

Qualifying Interests Feature: Najas flexilis (Slender Naiad) [1833] **M**
Conservation Objective: To maintain the favourable conservation condition of Najas flexilis (Slender Naiad) in Kilkieran Bay and Islands SAC

Attributes & Targets:
Population extent - No change to the spatial extent of Najas flexilis within each lake, subject to natural processes.
Population depth - No change to the depth range of Najas flexilis within each lake, subject to natural processes.
Population viability - No decline in plant fitness, subject to natural processes.
Population abundance - No change to the cover abundance of Najas flexilis, subject to natural processes.
Species distribution - No decline, subject to natural processes.

Habitat extent - No decline, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat for the species.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry.
Water quality - Maintain appropriate water quality to support the populations of the species.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the populations of Najas flexilis, subject to natural processes.
Water colour - Maintain appropriate water colour.
Associated species - Maintain appropriate associated species and vegetation communities.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.36.6km to the west of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Machairs (* in Ireland) [21A0], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] and Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510].
- Phocoena phocoena (Harbour Porpoise) [1351] and Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Porpoise and Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Coastal lagoons [1150] **M** • Large shallow inlets and bays [1160] **M** • Reefs [1170] **M**	Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Machairs (* in Ireland) [21A0], Oligotrophic to mesotrophic standing

• Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R** • Mediterranean salt meadows (Juncetalia maritimi) [1410] **R** • Machairs (* in Ireland) [21A0] **R** • Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M** • Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**	waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] and Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**
Qualifying Interests (QI): Species • Phocoena phocoena (Harbour Porpoise) [1351] **M*** • Lutra lutra (Otter) [1355] **M** • Phoca vitulina (Harbour Seal) [1365] **M** • Najas flexilis (Slender Naiad) [1833] **M**	The risk of disturbance effects on Harbour Porpoise [1351] and Harbour Seal [1365] associated with construction and operational activities applies. **Mitigation required**

11. AA Summary Matrix for Lower River Shannon SAC (002165)

Lower River Shannon SAC (002165) is located c.53-100km to the south and southwest of the site.
Lower River Shannon SAC | National Parks & Wildlife Service

Description of the Site: According to the Site Synopsis for this SAC, this very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. Rivers within the sub-catchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarriff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The Shannon and Fergus Rivers flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones predominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian rocks and the western stretches

through Carboniferous limestone. The Mulkear flows through Lower Palaeozoic rocks in the upper reaches before passing through Namurian rocks, followed by Lower Carboniferous shales and Carboniferous limestone. The Mulkear River itself, immediately north of Pallas Green, passes through an area of Rhyolites, Tuffs and Agglomerates.

The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary.

Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (Zostera spp.) beds and patches of green algae (e.g. Ulva sp. and Enteromorpha sp.). The main macro-invertebrate community which has been noted from the inner Shannon and Fergus estuaries is a MacomaScrobicularia-Nereis community.

In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of Common Cord-grass (Spartina anglica) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (Salicornia europaea agg.). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (Phragmites australis) and club-rushes (Scirpus maritimus, S. tabernaemontani and S. triquetrus). In addition to the nationally rare Triangular Club-rush (Scirpus triqueter), two scarce species are found in some of these creeks (e.g. Ballinacurra Creek): Lesser Bulrush (Typha angustifolia) and Summer Snowflake (Leucojum aestivum).

Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoylan Quay. The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh-grass (Puccinellia maritima), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Sea-milkwort (Glaux maritima), Sea Plantain (Plantago maritima), Red Fescue (Festuca rubra), Creeping Bent (Agrostis stolonifera), Saltmarsh Rush (Juncus gerardi), Long-bracted Sedge (Carex extensa), Lesser Sea-spurrey (Spergularia marina) and Sea Arrowgrass (Triglochin maritima). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (Juncus maritimus) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus estuary: a type of robust saltmarsh-grass (Puccinellia foucaudii), sometimes placed within the species Common Saltmarsh-grass (P. maritima) and Hard-grass (Parapholis strigosa).

Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. Cloonconeen Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat. The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (Ruppia maritima) and green algae (Cladophora sp.). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (Hydrobia ventrosa, Cerastoderma glaucum, Lekanesphaera hookeri, Palaemonetes varians, Sigara stagnalis and Enochrus bicolor). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of stonewort (Chara canescens and Chara cf. connivens).

Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (Beta vulgaris subsp. maritima), Sea Campion (Silene vulgaris subsp. maritima), Thrift and plantains (Plantago spp.). A rare endemic type of sealavender, Limonium recurvum subsp. pseudotranswallianum, occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (Anthyllis vulneraria) and Common Bird’s-foot-trefoil (Lotus corniculatus).

The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action. Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top, and below this each of the shores has different characteristic species giving a range of different shore types.

The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of the Purple Sea Urchin Paracentrotus lividus are found. The communities found are tolerant to sand scour and tidal streams. The infralittoral reefs range from sloping platforms with some vertical steps, to ridged bedrock with gullies of sand between the ridges, to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18 m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae.

Other coastal habitats that occur within the site include stony beaches and bedrock shores (these support a typical zonation of seaweeds such as Fucus spp., Ascophyllum nodosum and kelps), shingle beaches (with species such as Sea

Beet, Sea Mayweed - Matricaria maritima, Sea Campion and Curled Dock - Rumex crispus), sandbanks which are slightly covered by sea water at all times (e.g. in the area from Kerry Head to Beal Head) and sand dunes (a small area occurs at Beal Point, where Marram – Ammophila arenaria is the dominant species).

Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon is broad, generally slow flowing and naturally eutrophic; the Fergus is smaller and alkaline; while the narrow, fast flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth. Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. One grassland type of particular conservation significance, Molinia meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes (Juncus spp.) and sedges (Carex spp.), and supporting a diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (Sisyrinchium bermudiana) and Pale Sedge (C. pallescens).

Floating river vegetation characterised by species of water-crowfoot (Ranunculus spp.), pondweeds (Potamogeton spp.) and the moss Fontinalius antipyretica are present throughout the major river systems within the site. The rivers contain an interesting bryoflora with Schistidium alpicola var. alpicola recorded from in-stream boulders on the Bilboa, new to Co. Limerick.

Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 50 m wide on the banks and somewhat wider on the largest island. The most prominent woodland type is gallery woodland where White Willow (Salix alba) dominates the tree layer with occasional Alder (Alnus glutinosa). The shrub layer consists of various willow species with Rusty Willow (Salix cinerea ssp. oleifolia) and what appear to be hybrids of S. alba x S. viminalis. The herbaceous layer consists of tall perennial herbs. A fringe of bulrush (Typha sp.) occurs on the river side of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ashalder woodland occur. These are poorly developed and contain numerous exotic species but locally there are signs that it is invading open grassland. Alder is the principal tree species, with occasional Pedunculate Oak (Quercus robur), elm (Ulmus glabra and U. procera), Hazel (Corylus avellana), Hawthorn (Crataegus monogyna) and the shrubs Guelder-rose (Viburnum opulus) and willows. The ground flora is species-rich.

While woodland is infrequent within the site, however Cahiracon Wood contains a strip of old oak woodland. Sessile Oak (Q. petraea) forms the canopy, with an understorey of Hazel and Holly (Ilex aquifolium). Great Wood-rush (Luzula sylvatica) dominates the ground flora. Less common species present include Great Horsetail (Equisetum telmeteia) and Pendulous Sedge (Carex pendula).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2 km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of birch (Betula spp.), Hazel, oak, Rowan (Sorbus aucuparia), some Ash (Fraxinus excelsior) and willow (Salix spp.). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora features prominent Great wood-rush and Bilberry (Vaccinium myrtillus), along with a typical range of woodland herbs. Bracken (Pteridium aquilinum) is a feature in areas where there is more light available.

The valley sides of the Bilboa and Gortnageragh Rivers, on higher ground north-east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, oak and birch. There is a good scrub layer with Hawthorn, willow, Holly and Blackthorn (Prunus spinosa) common. The herb layer in these woodlands is often open, with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The Hazel is actively coppiced in places.

There is a small area of actively regenerating cut-away raised bog at Ballyrorheen. It is situated approximately 5 km north-west of Cappamore in Co. Limerick. The bog contains some wet areas with good cover of bog mosses (Sphagnum spp.). Species of particular interest include Cranberry (Vaccinium oxycoccos) and White Sedge (Carex curta), along with two regionally rare mosses, including the bog moss S. fimbriatum. The site is being invaded by Downy Birch (Betula pubescens) scrub woodland. Both commercial forestry and the spread of Rhododendron (Rhododendron ponticum) has greatly reduced the overall value of the site.

A number of plant species that are listed in the Irish Red Data Book occur within the site, and several of these are protected under the Flora (Protection) Order, 1999. These include Triangular Club-rush (Scirpus triquetrus), a species which is only found in Ireland only in the Shannon Estuary, where it borders creeks in the inner estuary. Opposite-leaved Pondweed (Groenlandia densa) is found in the Shannon where it passes through Limerick City, while Meadow Barley (Hordeum secalinum) is abundant in saltmarshes at Ringmoylan and Mantlehill. Hairy Violet (Viola hirta) occurs in the Askeaton/Foynes area. Golden Dock (Rumex maritimus) is noted as occurring in the River Fergus estuary. Finally, Bearded Stonewort (Chara canescens), a brackish water specialist, and Convergent Stonewort (Chara connivens) are both found in Shannon Airport Lagoon.

Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-tailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland White-fronted Goose were regularly found, but none were seen in 1993/94.

Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96), Teal (2,319; 1995-

96), Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin (20,100; 1995/96), Snipe (719, 1995/96), Black-tailed Godwit (1,062; 1995/96), Curlew (1,504; 1995/96), Redshank (3,228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95). This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4,010 individuals at Loop Head, 1987).

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be 140 ± 12 individuals. Otter, a species also listed on Annex II of this Directive, is commonly found on the site.

Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (Petromyzon marinus), Brook Lamprey (Lampetra planeri), River Lamprey (Lampetra fluviatilis), Twaite Shad (Allosa fallax fallax) and Salmon (Salmo salar). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon, while the Mulkear catchment excels as a grilse fishery, though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of lamprey.

Two additional fish species of note, listed in the Irish Red Data Book, also occur, namely Smelt (Osmerus eperlanus) and Pollan (Coregonus autumnalis pollan). Only the former has been observed spawning in the Shannon.

Freshwater Pearl Mussel (Margaritifera margaritifera), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River.

There is a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle, and some areas have been damaged through over-grazing and poaching. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments (especially along the Fergus estuary). Further, reclamation continues to pose a threat, as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale.

In the past, cord-grass (Spartina sp.) was planted to assist in land reclamation. This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds.

Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory, except in the upper estuary where it reflects the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences of industrial discharges apparent. Further industrial development along the Shannon and water polluting operations are potential threats. Fishing is a main tourist attraction on the Shannon and there are a large number of angler associations, some with a number of beats.

Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft.

This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Sandbanks which are slightly covered by sea water all the time [1110] **M**
- Estuaries [1130] **M**
- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Coastal lagoons [1150] **R**
- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Perennial vegetation of stony banks [1220] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**

- Salicornia and other annuals colonising mud and sand [1310] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
- Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] **R**
- Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R**
- Petromyzon marinus (Sea Lamprey) [1095] **R**
- Lampetra planeri (Brook Lamprey) [1096] **M**
- Lampetra fluviatilis (River Lamprey) [1099] **M**
- Salmo salar (Salmon) [1106] **R**
- Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
- Lutra lutra (Otter) [1355] **R**

Qualifying Interests Feature: Sandbanks which are slightly covered by sea water all the time [1110] **M**
Conservation Objective: To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in Lower River Shannon SAC

Attributes & Targets:
Habitat distribution - The distribution of sandbanks is stable, subject to natural processes.
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community type in a natural condition: Subtidal sand to mixed sediment with Nephtys spp. community complex.

Qualifying Interests Feature: Estuaries [1130] **M**
Conservation Objective: To maintain the favourable conservation condition of Estuaries in Lower River Shannon SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community.

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Lower River Shannon SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pontocrates spp. community; and Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex.

Qualifying Interests Feature: Coastal lagoons [1150] **R**
Conservation Objective: To maintain the favourable conservation condition of Coastal lagoons in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: chlorophyll *a* - Annual median chlorophyll *a* within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges and less than 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to maximum depth of lagoons.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Lower River Shannon SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pontocrates spp. community; Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone- dominated subtidal reef community; and Laminaria- dominated community complex.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Lower River Shannon SAC

Attributes & Targets:
Habitat distribution - The distribution of Reefs is stable, subject to natural processes.
Habitat area - The permanent habitat area is stable, subject to natural processes.
Community distribution - Conserve the following reef community types in a natural condition: Fucoid-dominated intertidal reef community complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone- dominated subtidal reef community; and Laminaria-dominated community complex.

Qualifying Interests Feature: Perennial vegetation of stony banks [1220] **M**
Conservation Objective: To maintain the favourable conservation condition of Perennial vegetation of stony banks in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the typical vegetated shingle flora including the range of sub- communities within the different zones.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Lower River Shannon SAC

Attributes & Targets:
Habitat length - Area stable or increasing, subject to natural processes, including erosion.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and hydrological regime - No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures.
Vegetation structure: zonation - Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in the Irish Sea cliff survey (Barron et al., 2011).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: bracken and woody species - Cover of bracken (Pteridium aquilinum) on grassland and/or heath to be less than 10%. Cover of woody species on grassland and/or heath to be less than 20%.

Qualifying Interests Feature: Salicornia and other annuals colonising mud and sand [1310] **M**
Conservation Objective: To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.

Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species- Spartina anglica - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
Conservation Objective: To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of the saltmarsh area vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species- Spartina anglica - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%.

Qualifying Interests Feature: Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
Conservation Objective: To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain natural circulation of sediments and organic matter, without any physical obstructions.

Physical structure: creeks and pans - Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%.

Qualifying Interests Feature: Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] **M**
Conservation Objective: To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime: river flow - Maintain appropriate hydrological regimes.
Hydrological regime: tidal influence - Maintain natural tidal regime.
Hydrological regime: freshwater seepages - Maintain appropriate freshwater seepage regimes.
Substratum composition: particle size range - The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (frequently sands, gravels and cobbles).
Water quality: nutrients - The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition.
Vegetation composition: typical species - Typical species of the relevant habitat sub-type should be present and in good condition.
Floodplain connectivity - The area of active floodplain at and upstream of the habitat should be maintained.
Riparian habitat - The area of riparian woodland at and upstream of the bryophyte-rich sub-type should be maintained.

Qualifying Interests Feature: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
Conservation Objective: To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - 30-70% of sward between 10 and 80cm high.
Vegetation composition: typical species - At least 7 positive indicator species present, including 1 "high quality" species.
Vegetation composition: notable species - No decline, subject to natural processes.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species less than 10%. Non-native invasive species, absent or under control.
Vegetation composition: negative indicator moss species - Bog mosses (Sphagnum spp.) not more than 10% cover; hair mosses (Polytrichum spp.) not more than 25% cover.
Vegetation structure: woody species and bracken (Pteridium aquilinum) - Cover of woody species and bracken not more than 5% cover.
Physical structure: bare ground - Not more than 10% bare ground.

Qualifying Interests Feature: Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] **R**
Cnservation Objective: To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) in Lower River Shannon SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, at least c.8.5ha for sites surveyed.
Habitat distribution - No decline.
Woodland size - Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size.
Woodland structure: cover and height - Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi- mature trees and shrubs; and well-developed herb layer.
Woodland structure: community diversity and extent - Maintain diversity and extent of community types.
Woodland structure: natural regeneration - Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.
Hydrological regime: flooding depth/height of water table - Appropriate hydrological regime necessary for maintenance of alluvial vegetation.
Woodland structure: dead wood - At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).
Woodland structure: veteran trees - No decline.
Woodland structure: indicators of local distinctiveness - No decline.
Vegetation composition: native tree cover - No decline. Native tree cover not less than 95%.

Vegetation composition: typical species - A variety of typical native species present, depending on woodland type, including alder (Alnus glutinosa), willows (Salix spp) and, locally, oak (Quercus robur) and ash (Fraxinus excelsior).
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.

Qualifying Interests Feature: Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R**
Conservation Objective: To restore the favourable conservation condition of Margaritifera margaritifera (Freshwater Pearl Mussel) in Lower River Shannon SAC

Attributes & Targets:
Distribution - Maintain at 7km.
Population size - Restore to 10,000 adult mussels.
Population structure: recruitment - Restore to least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length.
Population structure: adult mortality - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution.
Habitat extent - Restore suitable habitat in more than 3.3km and any additional stretches necessary for salmonid spawning.
Water quality: macroinvertebrate and phytobenthos (diatoms) - Restore water quality- macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93.
Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants) - Restore substratum quality- filamentous algae: absent or trace (<5%).
Substratum quality: sediment - Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment.
Substratum quality: oxygen availability - Restore to no more than 20% decline from water column to 5cm depth in substrate.
Hydrological regime: flow variability - Restore appropriate hydrological regimes.
Host fish - Maintain sufficient juvenile salmonids to host glochidial larvae.

Qualifying Interests Feature: Petromyzon marinus (Sea Lamprey) [1095] **R**
Conservation Objective: To restore the favourable conservation condition of Sea Lamprey in Lower River Shannon SAC

Attributes & Targets:
Distribution: extent of anadromy - Greater than 75% of main stem length of rivers accessible from estuary.
Population structure of juveniles - At least three age/size groups present.
Juvenile density in fine sediment - Juvenile density at least 1/m².
Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds.

Availability of juvenile habitat - More than 50% of sample sites positive.

Qualifying Interests Feature: Lampetra planeri (Brook Lamprey) [1096] **M**
Conservation Objective: To maintain the favourable conservation condition of Brook Lamprey in Lower River Shannon SAC

Attributes & Targets:
Distribution: extent of anadromy - Access to all water courses down to first order streams.
Population structure of juveniles - At least three age/size groups of brook/river lamprey present.
Juvenile density in fine sediment - Mean catchment juvenile density of brook/river lamprey at least 2/m².
Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds.
Availability of juvenile habitat - More than 50% of sample sites positive.

Qualifying Interests Feature: Lampetra fluviatilis (River Lamprey) [1099] **M**
Conservation Objective: To maintain the favourable conservation condition of River Lamprey in Lower River Shannon SAC

Attributes & Targets:
Distribution: extent of anadromy - Access to all water courses down to first order streams.
Population structure of juveniles - At least three age/size groups of river/brook lamprey present.
Juvenile density in fine sediment - Mean catchment juvenile density of river/brook lamprey at least 2/m².
Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds.
Availability of juvenile habitat - More than 50% of sample sites positive.

Qualifying Interests Feature: Salmo salar (Salmon) [1106] **R**
Conservation Objective: To restore the favourable conservation condition of Salmon in Lower River Shannon SAC

Attributes & Targets:
Distribution: extent of anadromy - 100% of river channels down to second order accessible from estuary.
Adult spawning fish - Conservation Limit (CL) for each system consistently exceeded.
Salmon fry abundance - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling.
Out-migrating smolt abundance - No significant decline.
Number and distribution of redds - No decline in number and distribution of spawning redds due to anthropogenic causes.

Water quality - At least Q4 at all sites sampled by EPA.

Qualifying Interests Feature: Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
Conservation Objective: To maintain the favourable conservation condition of Bottlenose Dolphin in Lower River Shannon SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Habitat use: critical areas - Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **R**
Conservation Objective: To restore the favourable conservation condition of Otter in Lower River Shannon SAC

Attributes & Targets:
Distribution – No significant decline.
Extent of terrestrial habitat - No significant decline. Area mapped and calculated as 596.8ha above high water mark (HWM); 958.9ha along river banks/ around ponds.
Extent of marine habitat - No significant decline. Area mapped and calculated as 4,461.6ha.
Extent of freshwater (river) habitat - No significant decline. Length mapped and calculated as 500.1km.
Extent of freshwater (lake/lagoon) habitat - No significant decline. Area mapped and calculated as 125.6ha.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.53-100km to the south and southwest of the site within the range of mobile mammal species. Given the distance, there is no source-pathway-receptor chain for adverse effect on Sandbanks which are slightly covered by sea water all the time [1110], Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Water courses of

plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410], Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Margaritifera margaritifera (Freshwater Pearl Mussel) [1029], Petromyzon marinus (Sea Lamprey) [1095], Lampetra planeri (Brook Lamprey) [1096], Lampetra fluviatilis (River Lamprey) [1099], Salmo salar (Salmon) [1106] and Lutra lutra (Otter) [1355].

- Tursiops truncatus (Common Bottlenose Dolphin) [1349] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Bottlenose Dolphin population associated with the SAC also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Habitats • Sandbanks which are slightly covered by sea water all the time [1110] **M** • Estuaries [1130] **M** • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Coastal lagoons [1150] **R** • Large shallow inlets and bays [1160] **M** • Reefs [1170] **M** • Perennial vegetation of stony banks [1220] **M** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M** • Salicornia and other annuals colonising mud and sand [1310] **M** • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R** • Mediterranean salt meadows (Juncetalia maritimi) [1410] **R** • Water courses of plain to montane levels with the Ranunculion fluitantis and	Sandbanks which are slightly covered by sea water all the time [1110], Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410], Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Margaritifera margaritifera (Freshwater Pearl Mussel) [1029], Petromyzon marinus (Sea Lamprey) [1095], Lampetra planeri (Brook Lamprey) [1096], Lampetra fluviatilis (River

Callitricho-Batrachion vegetation [3260] **M** • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M** • Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] **R** **Qualifying Interests (QI): Species** • Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] **R** • Petromyzon marinus (Sea Lamprey) [1095] **R** • Lampetra planeri (Brook Lamprey) [1096] **M** • Lampetra fluviatilis (River Lamprey) [1099] **M** • Salmo salar (Salmon) [1106] **R** • Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M** • Lutra lutra (Otter) [1355] **R**	Lamprey) [1099], Salmo salar (Salmon) [1106] and Lutra lutra (Otter) [1355] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required** The risk of disturbance effects Bottlenose Dolphin [1349] associated with construction and operational activities applies. **Mitigation required**

12. AA Summary Matrix for Blasket Islands SAC (002172)

Blasket Islands SAC (002172) is located c.156km to the south and southwest of the site
Blasket Islands SAC | National Parks & Wildlife Service

Description of the Site: The Blasket Islands are situated at the end of the Dingle peninsula in Co. Kerry. The site includes all of the islands in the group as well as a substantial area of the surrounding seas. There are six main islands, plus some rocky islets and sea stacks. Great Blasket Island, separated from the mainland by the Blasket Sound, is by far the largest of the islands (459 ha) and rises to 292 m above sea level. Inishtooskert (99 ha, 162 m), Inishnabro (51 ha, 175 m), Inishvickillane (81 ha, 138 m) and Tearaght Island (27 ha, 184 m) are located between approximately 7 km and 12 km from the mainland and, like Great Blasket, rise steeply from the sea. In contrast, Beginish is a small, low lying island (15 ha,

14 m) and lies within 2 km of the mainland. The bedrock is principally Old Red Sandstone, with some outcrops of volcanic and Silurian rocks on Inishvickillane and Beginish. The islands have a very maritime climate, being exposed to the prevailing Atlantic wind and swells. There are no permanent habitations, though Great Blasket was inhabited until 1953.

According to the Site Synopsis for this SAC, the vegetation of the islands is typical of exposed western islands. Sea cliffs are the dominant habitat and, aside from the cliffs themselves, much of the vegetation of the islands consists of species typical of cliffs or cliff-tops. Typical species of the more rocky cliffs include Rock Samphire (Crithmum maritimum), Tree-mallow (Lavatera arborea) and Rock Sea-spurrey (Spergularia rupicola). On the higher slopes where a maritime turf exists, swards of Thrift (Armeria maritima), Sea Campion (Silene vulgaris subsp. maritima), Sea Plantain (Plantago maritima) and Buck's-horn Plantain (Plantago coronopus) are all abundant, along with such species as Kidney Vetch (Anthyllis vulneraria), Common Bird's-foot-trefoil (Lotus corniculatus) and Common Scurvygrass (Cochlearia officinalis). Sea caves occur at the base of the cliffs on several of the islands.

The cliff vegetation merges into dry grassland dominated by Red Fescue (Festuca rubra) on several of the islands. Also occurring are areas dominated by Bracken (Pteridium aquilinum). Several of the islands have small areas of dry heath. Heather (Calluna vulgaris) is the main species and often occurs in a stunted form due to exposure. Other characteristic heath species include Heath Bedstraw (Galium saxitile) and Tormentil (Potentilla erecta).

The seas surrounding the islands have well-developed reef communities. In particular, there are good examples of exposed and tide swept shallow water kelp communities, deeper water sponge dominated communities and a hydroid dominated community. The kelp forest community, composed of Laminaria hyperborea, with Laminaria saccharina and/or Saccorhiza polyschides, extends to 18 m below sea level. There is an understorey of diverse foliose red algae, including the rare red alga Schizymenia dubyi. On vertical surfaces, jewel anemones (Corynactis viridis), massive sponges (Pachymatisma johnstonia) and encrusting sponges (Esperiopsis fucorum) are characteristic. There are patches of vertical cliff face in very exposed areas that are characterized by plumose anemones (Metridium senile) and dense bryozoans (Chartella papyracea) where the rare nudibranch Crimora papillata is found. Species richness in these marine communities can be high. At depths greater than 20 m animal dominated communities are found. The communities present may be characterised by Deadman's Fingers (Alcyonium digitatum), massive sponges such as Clinoa clelata, and species of Nemartesia hydroid, indicating that there is moderate tidal stream. Other areas have a mixture of cushion sponges, hydroids and the rose 'coral' Pentapora foliacea. The brown alga Carpomitra costata, an uncommon species, is found in this community and is considered a good indicator of clean oceanic waters.

The site has a large Grey Seal population (648-833 breeding in 2005; one-off moult count of 989 seals in 2007). This is one of the largest populations in the country and represents about one-third of the Irish population. The seals breed on

boulder beaches and caves on several of the islands. The seals on these islands are sometimes perceived as competitors for local fish stocks. This occasionally leads to threats to their welfare; the most recent occurred in November 2004 when a large number of adults and pups were shot and clubbed.

The site is also of importance for Harbour Porpoise, a species which has a regular presence in Blasket Sound. A population estimate in 2008 gave a figure of 267-477 individuals. Other cetaceans (whales and dolphins) regularly observed in the site include Common Dolphin, Bottle-nosed Dolphin, Risso's Dolphin, Killer Whale and Minke Whale. Few other mammal species occur on the islands, though Inishvickillane has an introduced population of native Red Deer.

The site supports one of the most important seabird colonies in the country, with at least 11 species of seabird breeding regularly. It is the most important site in the world for Storm Petrel, and in the country for Manx Shearwater, the populations of both being of international importance (approx. 51,000 and 20,534 pairs respectively in 2000/01). Nine other seabird species occur regularly in nationally important numbers, the populations of three being of particular importance, i.e. Fulmar (approx. 3,000 pairs), Lesser Black-backed Gull (421 pairs) and Puffin (approx. 5,000 individuals). Other species present in nationally important numbers are Shag (350+ pairs), Herring Gull (100+ pairs), Great Black-backed Gull (approx. 400 pairs), Kittiwake (750+ pairs), Razorbill (500+ individuals) and Black Guillemot (44+ individuals). Guillemot also breeds though in relatively low numbers (470+ individuals). Arctic Tern breeds in some years, with at least 200 pairs in 1988 and 102 pairs in 2001. The Blaskets is one of the few known sites in the country where Leach's Petrel has bred and may still breed.

The islands are traditional sites for Peregrine (1-2 pairs) and Chough (11 pairs in 2002). Both of these species are listed under the E.U. Birds Directive. Additional breeding species typical of western islands that occur include Oystercatcher, Rock Dove, Wheatear, Raven and possibly Twite. The Blaskets formerly had wintering populations of Greenland White-fronted Goose and Barnacle Goose. The islands have a long history of seabird recording, with a major survey being undertaken in 1988 and partly updated during the Seabird 2000 survey.

This extreme south-western maritime site has high conservation value owing to the occurrence of good examples of several habitats that are listed on Annex I of the E.U. Habitats Directive, i.e. vegetated sea cliffs, dry heath, marine caves and reefs, as well as populations of Grey Seal and Harbour Porpoise, both species that are listed on Annex II of this Directive. The site is also one of the most important seabird sites in the country, with the populations of two species present being of international importance and at least a further nine being of national importance. Of especial significance is that it is the most important site in the world for Storm Petrel. The occurrence of important populations of Storm Petrel and Arctic Tern is of particular note as these are listed on Annex I of the E.U. Birds Directive; also listed are Leach's Petrel, Peregrine and Chough. The islands are also noted for their cultural, and in particular, literary importance.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Reefs [1170] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **R**
- European dry heaths [4030] **M**
- Submerged or partially submerged sea caves [8330] **M**
- Phocoena phocoena (Harbour Porpoise) [1351] **M**
- Halichoerus grypus (Grey Seal) [1364] **M**

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Blasket Islands SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Subtidal reef with faunal turf and echinoderms community complex; Laminaria-dominated community.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **R**
Conservation Objective: To restore the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Blasket Islands SAC

Attributes & Targets:
Habitat length - Area stable, subject to natural processes, including erosion.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and hydrological regime - No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures.
Vegetation structure: zonation - Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Vegetation composition: bracken and woody species - Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%.

Qualifying Interests Feature: European dry heaths [4030] **M**
Conservation Objective: To maintain the favourable conservation condition of European dry heaths in Blasket Islands SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline from current habitat distribution, subject to natural processes.
Ecosystem function: soil nutrient status - Maintain soil nutrient status within natural range.
Vegetation structure: dwarf shrub indicator species - Cover of dwarf shrub indicator species at least 25%.
Vegetation structure: growth phases of ling (Calluna vulgaris) - Senescent proportion of ling (Calluna vulgaris) cover less than 50%. Outside boundaries of Sensitive Areas, all growth phases of ling should occur throughout, with at least 10% of cover in mature phase.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%.
Vegetation structure: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 5%.
Vegetation structure: burning - No signs of burning within sensitive areas.
Vegetation composition: positive indicator species - At least two positive indicator species, as listed in Perrin et al. (in prep), with combined cover of at least 60%.
Vegetation composition: bryophyte and non-crustose lichen species - Number of bryophyte or non-crustose lichen species present at least three, excluding Campylopus and Polytrichum mosses.
Vegetation composition: rare/scarce heath species - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.
Vegetation composition: bracken (Pteridium aquilinum) - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: negative indicator species - Cover of negative indicator "weed" species collectively less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: soft rush cover - Cover of soft rush (Juncus effusus) less than 10%.

Qualifying Interests Feature: Submerged or partially submerged sea caves [8330] **M**
Conservation Objective: To maintain the favourable conservation condition of Submerged or partially submerged sea caves in Blasket Islands SAC

Attributes & Targets:
Distribution - The distribution of sea caves occurring in the site should remain stable, subject to natural processes.
Community structure - Human activities should occur at levels that do not adversely affect the ecology of sea caves at the site.

Qualifying Interests Feature: Phocoena phocoena (Harbour Porpoise) [1351] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Porpoise in Blasket Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site.

Qualifying Interests Feature: Halichoerus grypus (Grey Seal) [1364] **M**
Conservation Objective: To maintain the favourable conservation condition of Grey Seal in Blasket Islands SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour – Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the grey seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.156km to the south and south west of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Reefs [1170]**,** Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], European dry heaths [4030] and Submerged or partially submerged sea caves [8330].
- Phocoena phocoena (Harbour Porpoise) [1351] and Halichoerus grypus (Grey Seal) [1364] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-

construction and construction activities to the Harbour Porpoise and Grey Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Reefs [1170] **M** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **R** • European dry heaths [4030] **M** • Submerged or partially submerged sea caves [8330] **M**	Reefs [1170], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], European dry heaths [4030] and Submerged or partially submerged sea caves [8330] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**
Qualifying Interests (QI): Species • Phocoena phocoena (Harbour Porpoise) [1351] **M** • Halichoerus grypus (Grey Seal) [1364] **M**	The risk of disturbance effects on Harbour Porpoise [1351] and Grey Seal [1364] associated with construction and operational activities applies. **Mitigation required**

13. AA Summary Matrix for West Connacht Coast SAC (002998)

West Connacht Coast SAC (002998) is located c.75km to the northwest of the site
West Connacht Coast SAC | National Parks & Wildlife Service

Description of the Site: This site consists of a substantial area of marine waters lying off the coasts of Counties Mayo and Galway in the west of Ireland. Comprising two parts, in its northern component the site extends from the coastal waters off Erris Head westwards beyond Eagle Island and the Mullet Peninsula in Co. Mayo. From there it extends southwards immediately off the coast as far as

the entrance to Blacksod Bay. In its southern component, the site stretches from Clare Island and the outer reaches of Clew Bay at Old Head and continues southwards off the Mayo coast to the Connemara coast near Clifden and Ballyconneely, Co Galway. Predominantly coastal in nature, the site extends westwards into Atlantic continental shelf waters up to approximately 7-11 km from the mainland, although in its southern component it remains mostly inshore of the main islands: Clare Island, Inishturk, Inishbofin and Inishshark. Its area contains subtidal waters fringing these and other islands, as well as islets and rocky skerries off the Co. Mayo and Co. Galway coasts.

According to the Site Synopsis for this SAC, the site encompasses a diverse range of shallow marine habitats occurring in waters less than 100 m deep. These include a variety of seabed structures including reefs, islets and sedimentary basins. The site contains physical and hydrographic features believed to be important for Bottle-nosed Dolphin, one of two cetacean species listed on Annex II of the E.U. Habitats Directive. These features include shallow coastal bays, areas of steep seafloor topography and complex areas of strong current flow adjacent to estuaries, coastal headlands and islands, sandbanks, shoals and reefs. Its area borders existing designated sites for protected species and habitats, and lies adjacent to a wide array of coastal features including sheltered bays, estuaries, coastal cliffs and sea caves, several of which are located within protected sites.

Bottle-nosed Dolphin occurs within the site in all seasons and the area comprises a key habitat for the species both regionally and within Irish waters as a whole. Survey data show that Bottle-nosed Dolphin occurrence within the site compares favourably with another designated site in Ireland, the Lower River Shannon. Local population estimates off south-west Co. Mayo and Connemara, Co. Galway describe a minimum of 123 dolphins, with possibly up to 150-200 individuals or more, occurring within the site as a whole, exceeding estimates for the Shannon Estuary population. Significant structural linkages have been established between groups of dolphins utilising various coastal habitats within the site, while a high proportion of individuals within this Bottle-nosed Dolphin community have been shown to range freely within its coastal waters. Analyses of genetic structure also show a fine scale distinction between dolphins sampled within the site and animals sampled at the Shannon Estuary or nationally.

Sighting records of Bottle-nosed Dolphins via coastal and boat-based observations from the Mullet Peninsula and outlying islands, outer Clew Bay, Clare Island, Roonagh, outer Killary Harbour, Ballynakill Harbour and west Connemara are significant for the west coast of Ireland and indicate widespread use of the area by individual groups of dolphins. Groups are known to alter their composition or to aggregate together within the site and comparatively high group sizes of up to 50-65 individual dolphins or more have been recorded in the site's northern and southern components. Adults closely accompanying calves are commonly observed in summer and autumn months at a number of locations within the site, and group foraging, resting or social behaviour are also regularly recorded. Individual dolphins are also known to recur within and between years at key locations within the site (e.g., outer Killary Harbour, off the Mullet Peninsula), indicating a degree of site fidelity to its coastal waters.

The waters of the West Connacht Coast represent an exceptional area of key conservation importance for Bottle-nosed Dolphin in Ireland.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
- Phocoena phocoena (Harbour Porpoise) [1351] **M**

Qualifying Interests Feature: Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M**
Conservation Objective: To maintain the favourable conservation condition of Bottlenose Dolphin in West Connacht Coast SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site.

Qualifying Interests Feature: Phocoena phocoena (Harbour Porpoise) [1351] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Porpoise in West Connacht Coast SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Porpoise community at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.75km to the northwest of the site within the range of mobile mammal species.
- Tursiops truncatus (Common Bottlenose Dolphin) [1349] and Phocoena phocoena (Harbour Porpoise) [1351] - Taking a precautionary approach, there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Bottlenose Dolphin and Harbour Porpoise population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Species • Tursiops truncatus (Common Bottlenose Dolphin) [1349] • Phocoena phocoena (Harbour Porpoise) [1351] **M**	The risk of disturbance effects on Bottlenose Dolphin [1349] and Harbour Porpoise [1351] associated with construction and operational activities applies. **<u>Mitigation required</u>**

14. AA Summary Matrix for Donegal Bay (Murvagh) SAC (000133)

Donegal Bay (Murvagh) SAC (000133) is located c.143km to the northwest of the site
Donegal Bay (Murvagh) SAC | National Parks & Wildlife Service

Description of the Site: This site occupies the inner part of Donegal Bay, immediately to the south-west of Donegal Town. It contains the estuary of the River Eske and a number of other significant rivers. The area is underlain by Carboniferous limestone and shale, although blown sand and other recent deposits obscure much of the solid geology.

According to the Site Synopsis for this SAC, most of the site consists of intertidal habitats, notably mud- and sandflats, sea inlets and bays, tidal rivers, estuarine channels and sandy beaches. These areas are generally unvegetated but are obviously nutrient-rich, as extensive beds of shellfish occur in parts of the bay. The following macro-invertebrate species are common throughout much of the bay: Arenicola marina, Hediste diversicolor, Scrobicularia plana and Macoma balthica.

Along some parts of the shore, saltmarsh has developed. Dominant plants there include Thrift (Armeria maritima), Red Fescue (Festuca rubra) and Common Scurvygrass (Cochlearia officinalis). Sea Arrowgrass (Triglochin maritima), Sharp Rush (Juncus acutus) and Saltmarsh Rush (J. gerardi) are also common, while brown seaweeds (Fucus spp.) are abundant lower down the shore profile.

On the stable parts of some of the shingle and boulder beaches, Common Scurvygrass also occurs, along with Silverweed (Potentilla anserina) and Sea-milkwort (Glaux maritima).

Sand dunes, including fixed dunes, occur in parts of the site, especially at Murvagh. Intact sections contain Sea Sandwort (Honkenya peploides) and Marram (Ammophila arenaria) in the young dunes, with abundant Marram in the fixed dunes. These stable areas are frequently species-rich, with abundant Field Wood-rush (Luzula campestris), a well-developed moss community including Thuidium tamariscinum and Rhytidiadelphus squarrosus, and herbs such as Common Bird's-foot-trefoil (Lotus corniculatus), Wild Thyme (Thymus praecox), Heath Dog-violet (Viola canina) and Lady's Bedstraw (Galium verum). Dune slacks also occur and in one slack the Red Data Book species Round-leaved Wintergreen (Pyrola rotundifolia) occurs. Typical species of dunes with Creeping Willow occur at Mullanasole and include: Creeping Willow (Salix repens), Sand sedge (Carex arenaria), Red Fescue, Lady's Bedstraw, Common Bird's-foot-trefoil and Mouse-ear Hawkweed (Pilosella officinarum) along with other typical species of fixed dune including: False Oat-grass (Arrhenatherum elatius), Selfheal (Prunella vulgaris), Wild Thyme and the mosses Hypnum cupressiforme, Rhytidiadelphus triquetrus and Rhytidiadelphus squarrosus. The Common Twayblade orchid (Listera ovata) occurs throughout this habitat. Other species present include: Creeping Bent (Agrostis stolonifera), Marram Grass and the moss Pleurozium schreberi.

Both Common Scoter and Brent Goose are found in the greater Donegal Bay area, from Bundoran north to Murvagh. The Bay provides one of the most important sites in the country for the Common Scoter, with peak numbers of approximately 1,500 individuals in 1984/85 - 1986/87. This species uses large wintering grounds making counts difficult, but in recent years peaks of 662 birds (1995/96) and 1,073 birds (1997/98) have been recorded in the area. Other wintering species of note from the site include Ringed Plover 175, Oystercatcher 119 and Dunlin 221 (data based on 18 counts from 1984/85 - 1986/87). Small numbers (up to 50) of Greenland White-fronted Goose from the Pettigo flock fed at Inishpat Island in the 1980s, but have rarely done so in recent years.

The site supports a population of Common Seal (maximum count of 148 in the all-Ireland survey of 2003). This species is listed on Annex II of the E.U. Habitats Directive.

Land use in the area consists of boating and fishing in the bay, with a little shellfish aquaculture. Grazing occurs on terrestrial habitats, while recreational pressures are severe on parts of the dunes. A large part of the dune system is excluded from the site due to its development as a golf course and to the presence of conifer plantations. Despite these pressures, the site is of international importance due to the presence of a wide range of habitats, including four listed on Annex I of the E.U. Habitats Directive, an important seal colony and the occurrence of significant bird populations.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M***
- Humid dune slacks [2190] **R**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Donegal Bay (Murvagh) SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Estuarine fine sands dominated by polychaetes and oligochaetes community complex; and Intertidal muddy sand to sand dominated by polychaetes, bivalves and crustaceans community complex.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To retain the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Donegal Bay (Murvagh) SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **R**
Conservation Objective: To restore the favourable conservation condition of Dunes with Salix repens ssp. argentea (Salicion arenariae) in Donegal Bay (Murvagh) SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Humid dune slacks [2190] **R**
Conservation Objective: To maintain the favourable conservation condition of Humid dune slacks in Donegal Bay (Murvagh) SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Ryle et al. (2009).
Vegetation composition: cover of Salix repens - Maintain <40% cover of creeping willow (Salix repens).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Seal in Donegal Bay (Murvagh) SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - The breeding sites should be maintained in a natural condition.

Moulting behaviour - The moult haul-out sites should be maintained in a natural condition.
Resting behaviour - The resting haul-out sites should be maintained in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.143km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Mudflats and sandflats not covered by seawater at low tide [1140], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] and Humid dune slacks [2190].
- Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M*** • Humid dune slacks [2190] **R** **Qualifying Interests (QI): Species** • Phoca vitulina (Harbour Seal) [1365] **M**	Mudflats and sandflats not covered by seawater at low tide [1140], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] and Humid dune slacks [2190] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>** The risk of disturbance effects on Phoca vitulina (Harbour Seal) [1365] associated with construction and operational activities applies. **<u>Mitigation required</u>**

15. AA Summary Matrix for St. John's Point SAC (000191)

St. John's Point SAC (000191) is located c.149km to the north of the site
St. John's Point SAC | National Parks & Wildlife Service

Description of the Site: St. John's Point is a 10 km-long, narrow peninsula running south-west from Dunkineely into Donegal Bay. The site covers the most southerly 4 km of the peninsula and includes some of the surrounding marine waters. The underlying geology is limestone. Tournaisian Basal Clastics form the majority of the underlying rocks, while Calp limestone of the Visean era outcrop at the south-western end of the site.

According to the Site Synopsis for this SAC, the grassland on the Calp limestone occurs on an undulating topography of low ridges with outcropping rocks and 'V' shaped valleys with peaty formations. The exposed limestone forms pavement where some unusual plants are found including Bloody Cranesbill (Geranium sanguineum), Northern Bedstraw (Galium boreale), Stone Bramble (Rubus saxatilis), Blue Moor-grass (Sesleria albicans) and English Hawkweed (Hieracium anglicum). More abundant plants on the thin soils and rocky clefts include Mountain Everlasting (Antennaria dioica), Broad-leaved Marsh-orchid (Dactylorhiza majalis), Burnet Rose (Rosa pimpinellifolia), Common Knapweed (Centaurea nigra) and Heath Spotted-orchid (Dactylorhiza maculata). On the steep slopes of the valley side, Blackthorn (Prunus spinosa), Bramble (Rubus fruticosus agg.) and Red Fescue (Festuca rubra) are abundant.

The wet valley bottoms contain flushes rich in Bogbean (Menyanthes trifoliata), Common Cottongrass (Eriophorum angustifolium), Marsh-marigold (Caltha palustris), Lesser Spearwort (Ranunculus flammula), Grass-of-parnassus (Parnassia palustris) and Common Scurvygrass (Cochlearia officinalis).

Heathy areas have developed on thin, peaty soils near the end of St. John's Point. Heather (Calluna vulgaris), Creeping Willow (Salix repens), Lousewort (Pedicularis sylvatica), Sweet Vernal-grass (Anthoxanthum odoratum) and Glaucous Sedge (Carex flacca) are all abundant. Dense swards of Buck's-horn Plantain (Plantago coronopus) also occur in this region.

Species-rich hay meadows are included within the site. Heath Spotted-orchid, Common Twayblade (Listera ovata), Common Spotted-orchid (Dactylorhiza fuchsii), Meadow Thistle (Cirsium dissectum), Primrose (Primula vulgaris), Yellow-rattle (Rhinanthus minor) and Ragged-Robin (Lychnis flos-cuculi) are all abundant meadow plants. Red Fescue and Sweet Vernal-grass are the dominant grasses.

Areas of Molinia meadow exist in the site, with Purple Moor-grass itself being a common component. Common Spotted-orchid (Dactylorhiza fuchsii), Early Marsh-orchid (D. incarnata) and Heath Spotted-orchid (D. maculata) have all been recorded in this habitat type at the site. Although relatively fragmented, and small in area, alkaline fen also exists at this site. It is not particularly species-rich, but the

various areas support a good diversity of vegetation communities, and the habitat is generally undisturbed and mostly intact.

Brackish marshes, which are inundated with sea water during storms, occur within the site. Common Reed (Phragmites australis), Bottle Sedge (Carex rostrata), Thread-leaved Water-crowfoot (Ranunculus trichophyllus) and Bogbean are all abundant species here.

There is a colony of the E.U. Habitats Directive Annex II and red-listed Marsh Fritillary butterfly on the peninsula. Its foodplant, Devil's-bit Scabious (Succisa pratensis), is common in the grass and heath vegetation and the colony present there is one of the best documented in Donegal.

The marine component of this site is estimated at 64% of the site area, with 40% marine waters and 24% rocky shore/intertidal zone. The former falls largely within the E.U. Habitat 'Large shallow inlets and bays'.

The exposed bedrock shore and sea cliffs are outstanding features of the site. The rocks are richly fossiliferous. Some sections of the shore have a limestone pavement-type structure with Common Scurvygrass, Thrift (Armeria maritima), Sea-milkwort (Glaux maritima), Red Fescue and Buck's-horn Plantain growing in the rock clefts. The sea cliffs can reach heights of up to 20m and are composed of Carboniferous limestone with a series of crevice ledges and a splash zone. Typical species known from the cliffs include Thrift, Sea Spleenwort (Asplenium marinum), Common Scurvygrass, Sea Plantain (Plantago maritima), Buck's-horn Plantain, Sea Campion (Silene maritima), Rock Sea-spurrey (Spergularia rupicola), Sea Mouse-ear (Cerastium diffusum), Red Fescue and the lichens Xanthoria parietina and Verrucaria sp.

The subtidal reefs at this site comprise one of the best examples of reef habitat in the country. The reefs range from being vertical cliff faces with overhangs and small caves to gently sloping from horizontal platforms to large or medium sized boulders. In some areas sand overlies the bedrock. They are exposed to moderate wave action. There is a well developed kelp forest of Laminaria hyperborea extending to 19 m depth with an understorey of diverse foliose red algae. Delesseria sanguinea and Cryptopleura ramosa are most abundant, and Odontalia dentatum occurs occasionally in the lower part of the forest. The latter is a northern species that is uncommon and has not been recorded any further south than Co. Mayo. The most conspicuous fauna are starfish (Asterias rubens), sea urchins (Echinus esculentus), sea cucumbers (Holothuria forskali) and the massive sponges Cliona celata and Pachymatisma johnstonia.

In the shallow water between 18 and 27 m there is a community characterised by a variety of red foliose algae including Delesseria sanguinea and Bonnemaisonia asparigoides, with occasional Dictyota dichotoma. Below 27 m the boulders are characterised by a community of hydroids, sponges and bryozoans. The cup coral Caryophyllia smithii is abundant, and both soft corals Alcyonium digitatum and Alcyonium glomeratum are occasional. On horizontal bedrock overlain by sand at 20 – 24 m there is a community comprising erect sponges, as well as the sea fan Eunicella verrucosa and the bryozoan Pentapora foliacea; here the sponges

Ciocalypta penicillus and Sphaerotyllus sp. are common, and Raspailia hispida occasional. Phakalia vermiculata is also recorded in this community; this has only recently been recorded from shallow water where it is uncommon and is the most northerly shallow water record for this species. A second community influenced by sand scour and characterised by cushion sponges and Ciocalypta penicillus occurs at 18 – 20 m. The hydroid Nemertesia antennina and anthozans Isozoanthus sulcatus and Epizoanthus couchii are frequent. The hydroid Corymorpha nutans is common in this community, while the anemone Aureliana heterocera, an uncommon species in Ireland, is rare. A third community characterised by cushion sponges and hydroids occurs on gently slopping bedrock that rises out of a sand plain at 25 m. The crevice dwelling species of brittlestar, Ophiactis balli, and the sea cucumber Aslia lefevrei are also present.

A community of erect sponges with the sea fan Eunicella verrucosa and the sea slug Tritonia nilsodhneri occurs between 21 and 27 m. The soft corals Alcyonium digitatum, Alcyonium glomeratum and the tunicate Diazona violacea are all frequent and the gastropod Gastrochaena dubia is common. Eunicella verrucosa and the sea slug Tritonia nilsodhneri are close to their northern limits in north Donegal Bay.

An example of the deep water Axinellid sponge community occurs at 46 m on horizontal bedrock with raised ridges, with the Axinellid sponge occurring on the flat surfaces and the soft corals Alcyonium digitatum, Alcyonium glomeratum and the massive sponge Pachymatisma johnstonia on the ridges. The deepwater starfish Stichastrella rosea is frequent and the rare bryozoan Reteporella beaniana and uncommon anthozoan Parazoanthus anguicomus are found in this community.

The vertical cliff with ledges, overhangs and small caves show zonation from 6 - 21 m. Red foliose algae occur on the ledges, with the jewel anemone Corynactis viridis being common at the top of the cliff and the cup coral Coryophyllia smithii common at the base. On the cliff under the overhang the anthozoan Parazoanthus axinellae and the sponge Biemna variantia occur. Parazoanthus axinellae reaches its northern limits in north Donegal Bay. An Axinellid sponge community is present on the ledges. The habitat is species-rich, with 93 species recorded.

There is an excellent fish community associates with the reefs.

Small marine caves are present in the cliff face described above and in areas of terraced bedrock with ledges and crevices. The caves support the soft coral Alcyonium glomeratum on the roof and the sea fan Eunicella verrucosa on the floor.

The subtidal sediments occur between 28 and 38 m depth and range from duned maerl gravel and live maerl to coarse sand to fine sand. A flat sandy plain is characterised by the burrowing sea cucumber Neopentadactyla mixta, the burrowing sea urchins Spatangus purpureus and E. flavescens, the sand mason worm Lanice conchilega, and the bivalves Dosinia exoleta and Moerella donacin. The latter is an uncommon species. An area of coarse rippled sand, with the sea

urchin Echinocardium cordatum and unidentified polychaete tubes, is present at the base of a reef.

Two areas of maerl occur on the east side of St. John's Point. One is an area of duned maerl gravel with live Lithothamnion corallioides in the hollows. Numerous crustaceans are present, in particular Atelycyclus rotandatus, Ebalia tuberosa, and Pisidia longicornis and the northern starfish Luidia sarai. In deeper water high dunes of maerl gravel and live Lithothamnion corallioides occur and are characterised by the burrowing sea urchins Spatangus purpureus, Echinocardium pennatifidium and E. flavescens, the bivalves Clausinella fasciata and Garia tellinella and abundant small crustaceans including Galathea intermedia and Liocarcinus marmoreus.

A small rocky islet occurs close to the south end of the point. A Herring Gull colony occurs here. Other birds seen feeding around the coast include Fulmar, Greater Black-backed Gull, Cormorant and Gannet. The freshwater marshes and rushy fields hold Snipe, Lapwing and Ringed Plover. The brackish lakes are frequented by Shelduck, Mallard, Mute Swan and Grey Heron.

The main land uses within the site are grazing of cattle and sheep near the end of the peninsula, while small hay meadows are maintained further north-east. Diving and fishing are frequent activities around the Point.

This site is important for its rich and diverse calcicole flora. A remarkable marine flora and fauna enhances the interest of the site, as does the presence of richly fossiliferous sea cliffs. Species-rich hay meadows and brackish marshes add diversity to the site.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R**
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **R**
- Alkaline fens [7230] **M**
- Limestone pavements [8240] **M**
- Submerged or partially submerged sea caves [8330] **M**
- Euphydryas aurinia (Marsh Fritillary) [1065] **M***
- Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M***

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in St. John's Point SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Maërl-dominated community, subject to natural processes.
Community structure - Conserve the high quality of the Maërl-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal coarse sediment with enchytraeid oligochaetes and Scolelepis squamata community complex; Sand to mixed sediment with polychaetes and Edwardsia spp. community complex; Intertidal reef community complex; Laminaria-dominated community complex; Subtidal reef with echinoderms and sponges community complex.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in St. John's Point SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Habitat distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: intertidal reef community complex; Laminaria-dominated community complex; Subtidal reef with echinoderms and sponges community complex.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in St. John's Point SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R**
Conservation Objective: To restore the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in St. John's Point SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **R**
Conservation Objective: To restore the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in St. John's Point SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including one "high quality" species as listed in O'Neill et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species less than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: moss species - Hair mosses (Polytrichum spp.) not more than 25% cover.
Vegetation composition: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 10 and 80cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.

Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Alkaline fens [7230] **M**
Conservation Objective: To maintain the favourable conservation condition of Alkaline fens in St. John's Point SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime - Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Peat formation - Active peat formation, where appropriate.
Water quality: nutrients - Appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation structure: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%.
Physical structure: drainage - Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%.

Qualifying Interests Feature: Limestone pavements [8240] **M**
Conservation Objective: To maintain the favourable conservation condition of Limestone pavements in St. John's Point SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Vegetation composition: typical species - At least seven positive indicator species present.
Vegetation composition: bryophyte layer - Bryophyte cover at least 50% on wooded pavement.
Vegetation composition: negative indicator species - Collective cover of negative indicator species on exposed pavement not more than 1%.
Vegetation composition: non-native species - Cover of non-native species not more than 1% on exposed pavement; on wooded pavement not more than 10% with no regeneration.
Vegetation composition: scrub - Scrub cover no more than 25% on exposed pavement.
Vegetation composition: bracken cover - Bracken (Pteridium aquilinum) cover no more than 10% on exposed pavement.
Vegetation structure: woodland canopy - Canopy cover on wooded pavement at least 30%.
Vegetation structure: dead wood - Sufficient quantity of dead wood on wooded pavement to provide habitat for saproxylic organisms.

Physical structure: disturbance - No evidence of grazing pressure on wooded pavement.
Indicators of local distinctiveness - Indicators of local distinctiveness are maintained.

Qualifying Interests Feature: Submerged or partially submerged sea caves [8330] **M**
Conservation Objective: To maintain the favourable conservation condition of Submerged or partially submerged sea caves in St. John's Point SAC

Attributes & Targets:
Distribution - The distribution of sea caves occurring in the SAC should remain stable, subject to natural processes.
Community structure - Conserve the following community type in a natural condition: Laminaria-dominated community complex.
Community structure - Human activities should occur at levels that do not adversely affect the ecology of sea caves in the SAC.

Qualifying Interests Feature: Euphydryas aurinia (Marsh Fritillary) [1065] **M***
Conservation Objective: To maintain the favourable conservation condition of Marsh Fritillary in St. John's Point SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M***
Conservation Objective: To maintain the favourable conservation condition of Bottlenose Dolphin in St. John's Point SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.143km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Large shallow inlets and bays [1160], Reefs [1170], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], 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], Alkaline fens [7230], Limestone pavements [8240], Submerged or partially

submerged sea caves [8330], and Euphydryas aurinia (Marsh Fritillary) [1065].

- Tursiops truncatus (Common Bottlenose Dolphin) [1349] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Habitats • Large shallow inlets and bays [1160] **M** • Reefs [1170] **M** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M*** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R** • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **R** • Alkaline fens [7230] **M** • Limestone pavements [8240] **M** • Submerged or partially submerged sea caves [8330] **M**	Large shallow inlets and bays [1160], Reefs [1170], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], 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], Alkaline fens [7230], Limestone pavements [8240], Submerged or partially submerged sea caves [8330], and Euphydryas aurinia (Marsh Fritillary) [1065] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>**
Qualifying Interests (QI): Species • Euphydryas aurinia (Marsh Fritillary) [1065] **M*** • Tursiops truncatus (Common Bottlenose Dolphin) [1349] **M***	The risk of disturbance effects on Tursiops truncatus (Common Bottlenose Dolphin) [1349] associated with construction and operational activities applies. **<u>Mitigation required</u>**

16. AA Summary Matrix for Inishmore Island SAC (000213)

Inishmore Island SAC (000213) is located c.39km to the west of the site Inishmore Island SAC | National Parks & Wildlife Service

Description of the Site: Inishmore Island is the largest of the three Aran Islands, situated approximately 8 km off the south coast of Co. Galway. Geologically an extension of the Burren, Co. Clare, the island is formed of Upper Carboniferous limestone strata, interleaved with layers of shale and clay. In places along the coast, spectacular cliffs rise to 90 m. A thin cover of rendzina occurs in pockets between blocks of bare limestone. This soil is combined with a mixture of sand and seaweed to form a partially man-made soil cover, built up over the centuries. The site also includes a large area of marine waters surrounding the island.

According to the Site Synopsis for this SAC, Inishmore has many good examples of submerged reef communities that are extremely exposed to wave action. On the infralittoral reef are two exceptional communities. Ireland's only recorded example of a population of sublittoral Purple Sea Urchins (Paracentrotus lividus) is on the west of the island, while at the reef in Blind Sound, is found Ireland's best example of an extremely exposed, shallow, infralittoral community that is dominated by a forest of the brown seaweed, Alaria esculenta, with a red seaweed and anemone turf. Rare species are present in the infralittoral reef community, including soft corals, sea fans and anemones. In deeper water, there are many unusual and fragile circalittoral reef communities. Communities that are characterized by the rare sea fan, Eunicella verrucosa, are widespread and species-rich despite their fragility. A number of other notable circalittoral species are found, including sponges, hydroids, nudibranchs, soft corals and ascidians. Large submerged marine caves on the south-east coast are unusually species-rich (76 species recorded) and are characterized by a diverse fauna of sponges, hydroids, bryozoans, soft corals, anemones, nudibranchs, echinoderms and ascidians. Some of the caves extend back as far as 20 to 30 m. They are probably the best known sea caves in Ireland.

Limestone pavement and its associated plant communities dominate the upland area in the south of the island. The limestone pavement includes smooth-blocky and shattered types. The bare pavement is interspersed with fine examples of speciesrich, dry calcareous grasslands. Dry heath, alpine heath and lowland hay meadows are additional habitats which occur on Inishmore.

A network of small, stone-walled fields dissect the island. Many fields enclose areas of limestone pavement and/or fine examples of species-rich, dry calcareous grasslands. Common species include Blue Moor-grass (Sesleria albicans), eyebrights (Euphrasia spp.), Wood Sage (Teucrium scorodonia), Carline Thistle (Carlina vulgaris) and Burnet Rose (Rosa pimpinellifolia), along with Knapweeds (Centaurea nigra and C. scabiosa), Orchids, Bloody Crane's-bill (Geranium sanguineum) and Spring Gentian (Gentiana verna). Two Red Data Book plant species have been recorded, Pyramidal Bugle (Ajuga pyramidalis) and Wood

Small-reed (Calamagrostis epigejos). The latter species is legally protected under the Flora (Protection) Order, 1999.

Dry limestone heath has developed in places, with Heather (Calluna vulgaris), Bell Heather (Erica cinerea), Purple Moor-grass (Molinia caerulea) and Black Bog-rush (Schoenus nigricans). Hoary Rock-rose (Helianthemum canum), a species listed in the Irish Red Data Book, occurs regularly throughout the dry heath and alpine heath habitats on the island. Other species found commonly in the heathy areas include Juniper (Juniperus communis), Blue Moor-grass, Bloody Crane's-bill, Quaking-grass (Briza media), Oxeye Daisy (Leucanthemum vulgare) and Wild Madder (Rubia peregrina).

A range of coastal habitats, some of which are listed on Annex I of the E.U. Habitats Directive, occur around the island. Sea cliffs occur along much of the southern coast of Inishmore and reach in excess of 80 m at the south-west end. The cliffs are mostly sheer and very exposed to the force of the Atlantic Ocean. They support a typical cliff flora, including the scarce species Roseroot (Rhodiola rosea). Inishmore also supports a variety of karstic lagoons, a type which is believed to be rare in Europe. All are in a natural state and of good quality. Loch Phort Chorrúch and Loch Dearg are good examples of karstic lagoons with cobble barriers. Loch an Chara, in particular, is a good example of a karstic saline lagoon with underground connections to the sea. It behaves almost like a 'tidal turlough'. The flora is typically lagoonal with three lagoonal specialists. The fauna is not rich but comprises a high number of lagoonal specialists, including the rare corixid species Sigara selecta (Order Hemiptera).

Machair is a form of coastal grassland which is characterised by a species-rich, dry calcareous grassland, with a short turf and a low abundance of sand-binding species such as Marram (Ammophila arenaria). The coastal habitats of Inishmore support a range of rare plant species. Purple Milk-vetch (Astragalus danicus) grows on machair and sandy places close to the sea. It is confined in Ireland to Inishmore and Inishmaan and is legally protected under the Flora (Protection) Order, 1999. Sea-kale (Crambe maritima) occurs on coastal sands and shingle around the island; Hairy Violet (Viola hirta) and Bee Orchid (Ophrys apifera) can be found among the coastal grasslands. All three species are listed in the Irish Red Data Book, and Hairy Violet is legally protected under the Flora (Protection) Order, 1999.

A number of sand dune habitats are found at this site, including embryonic dunes, Marram dunes, Fixed dunes, dunes with Creeping Willow (Salix repens) and dune slacks. Sand Couch (Elymus farctus) typically dominates the embryonic dunes, with accompanying species such as Sandwort (Honkenya peploides), Hairy Rock-cress (Arabis hirsuta), Sea Spurge (Euphorbia paralias), Sea-holly (Eryngium maritimum) and Sea Bindweed (Calystegia soldanella). Marram (Ammophila arenaria) dominates the Marram, or white, dunes, with some of the species listed above also being found. Additional important species in the fixed dunes include Red Fescue (Festuca rubra) and a number of compositae; Groundsel (Senecio vulgaris), Common Ragwort (Senecio jacobaea) and Dandelion (Taraxacum agg.). Rarer species, also linked to the fixed dunes, include Purple Milk-vetch, Autumn Lady's-tresses (Spiranthes spiralis), Bee Orchid (Ophrys apifera) and Dodder

(Cuscuta epithymum). In the dune slacks, Creeping Willow, Kidney Vetch (Anthyllis vulneraria) and Common Bird's-foot-trefoil (Lotus corniculatus) are all common.

On Inishmore, the vegetation of stony banks consists of such species as the rare Red Data Book species Sea-kale, along with Sea Couch, Sea Mayweed (Matricaria maritima), Spear-leaved Orache (Atriplex prostrata), and Sea Beet (Beta vulgaris subsp. maritima).

Traditional farming practices, in the form of rye cultivation for thatching, has maintained suitable habitat for a number of Rare and threatened arable weeds. Darnel (Lolium temulentum), Smooth Brome (Bromus racemosus), Cornflower (Centaurea cyanus) and Bristle Oat (Avena strigosa) all occur on Inishmore. All four species are listed in the Irish Red Data Book and, prior to their discovery on the Aran Islands, some of these species were thought to have been extinct in Ireland. These lowland hay meadows are excellent examples of this rare and floristically diverse habitat.

The birdlife of Inishmore is considered to be of international significance, due to the presence of significant numbers of bird species listed under Annex I of the E.U. Birds Directive. Chough, Little Tern, Arctic Tern and Peregrine Falcon all breed here. Additional bird species on Inishmore include Merlin, Kestrel, Sparrowhawk, Linnet and Goldfinch. Along the western coastline, cliffs provide excellent nesting sites for Guillemot, Fulmar, Razorbill, Shag, Herring Gull, Great Black-backed Gull and Kittiwake.

A colony of Common Seals is occasionally seen, resting on the island's shores. This species is listed under Annex II of the E.U. Habitats Directive.

The mollusc, Vertigo angustior, a species that is listed on Annex II of the E.U. Habitats Directive, occurs at three different locations within the site, two on dune and one on maritime grass, the latter an unusual habitat for the species. This is the only known island population of this rare snail.

Most of the island is grazed by cattle and sheep and, in places, goats. Agricultural intensity is relatively higher here than on the other two Aran Islands. Parts of the site have been damaged by over-grazing and agricultural improvement. Elsewhere, the abandonment of farming, in favour of tourism and related enterprises, has resulted in the increase in scrub and particularly Bramble (Rubus fruticosus agg.) thickets. This is at the expense of species-rich grasslands. An increase in leisure activities, in particular scrambling and walking, on the Marram dunes at the east of the island, has resulted in damage to this habitat. Maintenance of traditional farming practices, which include winter grazing, absence of fertilisers and the cultivation of rye for thatching, is vital to preserve the species-richness and high diversity of the island flora. Development plans for tourism and amenity require close monitoring, to safeguard the wildlife and scientific value of this unique environment.

Inishmore is of considerable scientific interest primarily for the wide range of good quality habitats which occur, and the floristic richness of many of these habitats.

The island supports an impressive array of rare and threatened plant species, and it also provides excellent habitat for several bird species. The cultural heritage of Inishmore (and in particular the continuation of traditional, low-intensity farming practices) is intrinsically linked with its scientific interest. The island is also of high scenic and amenity value.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Coastal lagoons [1150] **R**
- Reefs [1170] **M**
- Perennial vegetation of stony banks [1220] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**
- Embryonic shifting dunes [2110] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **M**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M**
- Humid dune slacks [2190] **M**
- Machairs (* in Ireland) [21A0] **R**
- European dry heaths [4030] **M**
- Alpine and Boreal heaths [4060] **Under review**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
- Limestone pavements [8240] **M**
- Submerged or partially submerged sea caves [8330] **M**
- Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
- Phocoena phocoena (Harbour Porpoise) [1351] **M**

Qualifying Interests Feature: Coastal lagoons [1150] **R**
Conservation Objective: To restore the favourable conservation condition of Coastal lagoons in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.

Water quality: Chlorophyll *a* - Annual median chlorophyll *a* within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges and less than 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to maximum depth of lagoons.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Inishmore Island SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Intertidal reef community complex; Laminaria-dominated community complex; Subtidal reef community complex.

Qualifying Interests Feature: Perennial vegetation of stony banks [1220] **M**
Conservation Objective: To maintain the favourable conservation condition of Perennial vegetation of stony banks in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M**
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Inishmore Island SAC

Attributes & Targets:
Habitat length - Area stable, subject to natural processes, including erosion.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and hydrological regime - No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures.
Vegetation structure: zonation - Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: bracken and woody species - Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-native species) to represent less than 5% cover

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **M**
Conservation Objective: To maintain the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses - 95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M**
Conservation Objective: To maintain the favourable conservation condition of Dunes with Salix repens ssp. argentea (Salicion arenariae) in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% cover, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: cover and height of Salix repens - Maintain more than 10% cover of Salix repens (creeping willow); vegetation height should be in the average range 5 - 20cm.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - For trees and scrub other than creeping willow (Salix repens), there should be no more than 5% cover or their presence should be under control.

Qualifying Interests Feature: Humid dune slacks [2190] **M**
Conservation Objective: To maintain the favourable conservation condition of Humid dune slacks in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground.
Vegetation structure: vegetation height - Maintain structural variation within sward.

Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: cover of Salix repens - Maintain less than 40% cover of creeping willow (Salix repens).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **R**
Conservation Objective: To restore the favourable conservation condition of Machairs in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of machair habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.
Vegetation composition: bryophytes - Should always be at least an occasional component of the vegetation.

Qualifying Interests Feature: European dry heaths [4030] **M**
Conservation Objective: To maintain the favourable conservation condition of European dry heaths in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline from current habitat distribution, subject to natural processes.
Ecosystem function: soil nutrient status - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - At least two positive indicator species, as listed in Perrin et al. (2014), with combined cover of at least 50%.

Vegetation composition: bryophyte and non-crustose lichen species - At least three bryophyte or non-crustose lichen species present, excluding Campylopus and Polytrichum moss species.
Vegetation composition: rare/scarce species - No decline in distribution or population sizes of rare/scarce species associated with the habitat.
Vegetation structure: dwarf shrub species - Cover of bog myrtle (Myrica gale), creeping willow (Salix repens) and Western gorse (Ulex gallii) collectively less than 50%.
Vegetation composition: negative indicator weed species - Cover of negative indicator weedy species collectively less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation structure: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: senescent ling - Senescent proportion of ling (Calluna vulgaris) cover less than 50%.
Vegetation structure: growth phases of ling - Outside boundaries of sensitive areas, all growth phases of ling (Calluna vulgaris) should occur throughout, with at least 10% of cover in mature phase.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning within sensitive areas.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.

Qualifying Interests Feature: Alpine and Boreal heaths [4060] **Under review**
Conservation Objective: The status of Alpine and Boreal heaths as a qualifying Annex I habitat in Inishmore Island SAC is currently under review.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
Conservation Objective: To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.

Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
Conservation Objective: To maintain the favourable conservation condition of Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including one "high quality" species as listed in O'Neill et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species and bracken not more than 5%.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 50% of sward between 10cm and 50cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 5% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Limestone pavements [8240] **M**
Conservation Objective: To maintain the favourable conservation condition of Limestone pavements in Inishmore Island SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Vegetation composition: typical species - At least seven positive indicator species present.
Vegetation composition: negative indicator species - Collective cover of negative indicator species on exposed pavement not more than 1%.
Vegetation composition: non-native species - Cover of non-native species not more than 1% on exposed pavement.
Vegetation composition: scrub - Scrub cover no more than 25% of exposed pavement.
Vegetation composition: bracken cover - Bracken (Pteridium aquilinum) cover no more than 10% on exposed pavement.
Indicators of local distinctiveness - Indicators of local distinctiveness are maintained.

Qualifying Interests Feature: Submerged or partially submerged sea caves [8330] **M**
Conservation Objective: To maintain the favourable conservation condition of Submerged or partially submerged sea caves in Inishmore Island SAC

Attributes & Targets:
Habitat area - The permanent area of sea caves is stable or increasing, subject to natural processes.
Habitat distribution - The distribution of sea caves occurring in the site should remain stable, subject to natural processes.
Community structure - Conserve the following community type in a natural condition: Sea cave community complex.
Community structure - Human activities should occur at levels that do not adversely affect the ecology of sea caves in this SAC.

Qualifying Interests Feature: Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
Conservation Objective: To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Inishmore Island SAC

Attributes & Targets:
Distribution: occupied sites - No decline.
Occurrence in suitable habitat - No decline. A minimum of 60% of samples positive in optimal habitat and 20% in sub-optimal habitat.
Optimal soil wetness - Soils, at time of sampling, are damp (optimal wetness) for at least 50m along the established transect; at least 75% of sampling stops are at optimal wetness.

Habitat extent - Stable or increasing, subject to natural processes. No less than 15ha of at least sub-optimal habitat at Cill Mhuirbhigh and no less than 2ha at the airport.

Qualifying Interests Feature: Phocoena phocoena (Harbour Porpoise) [1351] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Porpoise in Inishmore Island SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Porpoise community at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.39km to the west of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Coastal lagoons [1150], Reefs [1170], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170], Humid dune slacks [2190], Machairs (* in Ireland) [21A0], European dry heaths [4030], Alpine and Boreal heaths [4060], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], Limestone pavements [8240], Submerged or partially submerged sea caves [8330], and Vertigo angustior (Narrow-mouthed Whorl Snail) [1014].
- Phocoena phocoena (Harbour Porpoise) [1351] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Coastal lagoons [1150] **R** • Reefs [1170] **M** • Perennial vegetation of stony banks [1220] **M**	Coastal lagoons [1150], Reefs [1170], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with

• Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M** • Embryonic shifting dunes [2110] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **M** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] **M** • Humid dune slacks [2190] **M** • Machairs (* in Ireland) [21A0] **R** • European dry heaths [4030] **M** • Alpine and Boreal heaths [4060] **Under review** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M** • Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M** • Limestone pavements [8240] **M** • Submerged or partially submerged sea caves [8330] **M**	Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170], Humid dune slacks [2190], Machairs (* in Ireland) [21A0], European dry heaths [4030], Alpine and Boreal heaths [4060], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], Limestone pavements [8240], Submerged or partially submerged sea caves [8330], and Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>**
Qualifying Interests (QI): Species • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M** • Phocoena phocoena (Harbour Porpoise) [1351] **M**	The risk of disturbance effects on Phocoena phocoena (Harbour Porpoise) [1351] associated with construction and operational activities applies. **<u>Mitigation required</u>**

17. AA Summary Matrix for Killala Bay/ Moy Estuary SAC (000458)

Killala Bay/ Moy Estuary SAC (000458) is located c.95km to the north of the site
Killala Bay/Moy Estuary SAC | National Parks & Wildlife Service

Description of the Site: North of Ballina town, the River Moy flows to the sea via a long, narrow estuarine channel. After approximately 8 km, the estuary widens to form a north-facing triangular bay, with the towns of Inishcrone (Co. Sligo) and Killala (Co. Mayo) situated on the eastern and western shores, respectively. The estuary itself forms the County boundary along its northern part. A long sandy island (Bartragh Island) separates the south-western side of the bay from the open water. Much of the inner part of the bay is intertidal. The northern part shelves to approximately -10 m.

According to the Site Synopsis for this SAC, extensive sandflats and mudflats are exposed in the estuary and bay at low tide. For the most part, these flats are unvegetated, but mats of Eelgrass (Zostera spp.), Beaked Tasselweed (Ruppia maritima) and green algae (Enteromorpha spp.) occur which provide important feeding material for birds. The estuary is generally in a natural state and is considered to be one of the best examples of a largely unpolluted system in Ireland.

The dune systems at Bartragh Island, Inishcrone and Ross, to the north-west, are well-developed and constitute good examples of dunes with a rich and diverse flora. Dunes dominated by Marram (Ammophila arenaria) are located at all three sub-sites.

At Enniscrone they stretch the length of the strand and are particularly well-developed towards the western end. They are found along the northern stretch of Ross and also run the length of Bartragh Island. Other species found growing in this habitat include Cat's-ear (Hypochoeris radicata), Smooth Sow-thistle (Sonchus oleraceus) and Groundsel (Senecio vulgaris). Associated with the Marram dunes are embryonic foredunes and these are particularly well-represented at Enniscrone. The most commonly encountered species in the foredunes include Sand Couch (Elymus farctus), Sea Sandwort (Honkenya peploides), Sea Rocket (Cakile maritima) and Lyme Grass (Leymus arenarius).

Although much of the fixed dune area has been developed as golf course or improved for agriculture, the site still contains a relatively large area of intact fixed dunes, a priority habitat listed on Annex I of the E.U. Habitats Directive. Species recorded include Red Fescue (Festuca rubra), Lady's Bedstraw (Galium verum), Kidney Vetch (Anthyllis vulneraria), Common Centuary (Centaurium erythraea), Sand Sedge (Carex arenaria), Harebell (Campanula rotundifolia), Wild Thyme (Thymus praecox), Fairy Flax (Linum catharticum), Common Bird's-foot-trefoil (Lotus corniculatus) and Pyramidal Orchid (Anacamptis pyramidalis). Bryophyte communities are well represented, with such species as Brachythecium rutabulum,

Homalothecium lutescens and Tortula ruraliformis. Lichens (Peltigera spp.) are also frequent. Humid dune slacks occur at Ross. Species present include Jointed Rush (Juncus articulatus), Common Spike Rush (Eleocharis palustris), Water Mint (Mentha aquatica), Meadowsweet (Filipendula ulmaria), Creeping Willow (Salix repens), Silverweed (Potentilla anserina), orchids (Dactylorhiza spp.), Common Twayblade (Listera ovata) and the moss Calliergon cuspidatum. A similar species complement is found in the wet hollows at Enniscrone and there also appears to be some large slack-like areas to the rear of Bartragh Island.

Saltmarshes are present in sheltered parts of the site, some of which occur in association with the dune systems. Species typical of Atlantic salt meadows commonly observed include Common Saltmarsh-grass (Puccinellia maritima), Thrift (Armeria maritima), Sea Aster (Aster tripolium) and Red Fescue. Occasionally Laxflowered Sea-lavender (Limonium humile) and Saltmarsh Flat-sedge (Blysmus rufus) are present, along with some stands of Sea Rush (Juncus maritimus). On the lower marshes, and extending out onto the most sheltered parts of the open mudflats, typical pioneering species such as glassworts (Salicornia spp.) and Annual Sea-blite (Suaeda maritima) occur.

Elsewhere along the coastline are sandy beaches, shingle beaches and some bedrock shores which are occasionally backed by clay sea-cliffs, such as at Moyne. Species such as Sea Rocket, Colt's-foot (Tussilago farfara) and Sea Mayweed (Matricaria maritima) are indicative of the habitat 'annual vegetation of drift lines'. South-east of Killala town, Lough Meelick adds habitat diversity to the site. It is significant for the presence of the Thin-lipped Mullet, a fish which is only occasionally found in the region.

A number of rare plants have been found in the site. Opposite-leaved Pondweed (Groenlandia densa), a species protected under the Flora (Protection) Order, 2015, has been recorded in the Moy Estuary, and Hoary Whitlowgrass (Draba incana), a Red Data Book species, has been recorded from sand dunes along the coast east of Killala town.

The site holds populations of three species listed on Annex II of the E.U. Habitats Directive: Common Seal (maximum count of 108 in the all-Ireland survey of 2003); Sea Lamprey and Narrow-mouthed Whorl Snail (Vertigo angustior). The rare snail has been known at this site for over 100 years. It occurs in an area of wet marsh and this site represents one of the few remaining examples of Vertigo angustior in its marsh "phase". This species has been declining throughout much of its range due to loss of habitat, and in particular, drainage of wetlands.

The site is very important for wintering waterfowl, with eight species having populations of national importance. These are as follows, with numbers referring to the average peaks over winters 1994/95 - 1997/98: Red-breasted Merganser (38), Ringed Plover (207), Grey Plover (200), Knot (429), Sanderling (135), Dunlin (1816), Bar-tailed Godwit (309) and Greenshank (19). Other notable populations include Golden Plover (1303) and Brent Goose (166). At times Brent Goose occur in numbers of international importance (>200). The presence 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.

This composite site has an excellent range of good quality coastal habitats, including a number listed on Annex I of the E.U. Habitats Directive. In particular, the dune complex at Bartragh Island is relatively undisturbed and is considered to be one of the best in the country in terms of its naturalness and intact state. The presence of the Annex II snail, Vertigo angustior, and the importance of the area for wintering waterfowl, including two Annex I Birds Directive species, adds further significance to this area. The site is extremely scenic and is a significant regional amenity area for its beaches and for fishing.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Estuaries [1130] **M**
- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Annual vegetation of drift lines [1210] **M**
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
- Salicornia and other annuals colonising mud and sand [1310] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M**
- Embryonic shifting dunes [2110] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Humid dune slacks [2190] **R**
- Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
- Petromyzon marinus (Sea Lamprey) [1095] **M**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Estuaries [1130] **M**
Conservation Objective: To maintain the favourable conservation condition of Estuaries in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by Hydrobia ulvae, Pygospio elegans and Tubificoides benedii community complex; Estuarine muddy sand dominated by Hediste diversicolor and Heterochaeta costata community complex; and Fine sand dominated by Nephtys cirrosa community complex.

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by Hydrobia ulvae, Pygospio elegans and Tubificoides benedii community complex; Estuarine muddy sand dominated by Hediste diversicolor and Heterochaeta costata community complex and Fine sand dominated by Nephtys cirrosa community complex.

Qualifying Interests Feature: Annual vegetation of drift lines [1210] **M**
Conservation Objective: To maintain the favourable conservation condition of Annual vegetation of drift lines in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sea rocket (Cakile maritima), sea sandwort (Honckenya peploides), prickly saltwort (Salsola kali) and Orache (Atriplex spp.).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M***
Conservation Objective: To maintain the favourable conservation condition of Vegetated sea cliffs of the Atlantic and Baltic coasts in Killala Bay/ Moy Estuary SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Salicornia and other annuals colonising mud and sand [1310] **M**
Conservation Objective: To maintain the favourable conservation condition of Salicornia and other annuals colonising mud and sand in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Vegetation structure: vegetation cover - Maintain more than 90% of the area outside of the creeks vegetated.
Vegetation composition: typical species & sub-communities - Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species- Spartina anglica - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M**
Conservation Objective: To maintain the favourable conservation condition of Atlantic salt meadows in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure/ allow to develop, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% of the area outside of the creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).
Vegetation structure: negative indicator species- Spartina anglica - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **M**
Conservation Objective: To maintain the favourable conservation condition of Embryonic shifting dunes in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch (Elytrigia juncea) and/or lyme- grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch (Elytrigia juncea) and/or lyme- grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation composition: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species (including Hippophae rhamnoides) - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Humid dune slacks [2190] **R**
Conservation Objective: To restore the favourable conservation condition of Humid dune slacks in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Habitat area – Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Ryle et al. (2009).

Vegetation composition: cover of S. repens - Maintain more than 40% cover of creeping willow (Salix repens).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
Conservation Objective: To maintain the favourable conservation condition of Embryonic shifting dunes in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Distribution: occupied sites - No decline.
Presence on transect - Adult or sub-adult snails are present in at least 3 places on the transect where optimal or sub-optimal habitat occurs (minimum 5 samples).
Abundance - At least 2 samples on the transect have more than 10 V. angustior individuals (minimum 5 samples).
Transect habitat quality - More than 50m of habitat along the transect is classed as optimal or sub-optimal.
Transect optimal wetness - Soils, at time of sampling, are damp (optimal wetness) and covered with a layer of humid thatch for more than 50m along the transect.
Habitat area - 1.465ha of potential habitat (optimal and sub-optimal); Optimal habitat is defined as marsh with transition of ecotone between red fescue (Festuca rubra) and silverweed (Potentilla anserina) wet grassland and waterlogged marsh dominated by yellow iris (Iris pseudacorus) and low growing herbs. Vegetation height 20-40cm. Habitat growing on wet to saturated soil covered with a deep layer of mosses and humid, open structured thatch. Sub-optimal habitat is defined as for optimal habitat, but either vegetation height is less than 20cm, or between 40 and 50cm; or the soil is dry or covered with standing water.

Qualifying Interests Feature: Petromyzon marinus (Sea Lamprey) [1095] **M**
Conservation Objective: To maintain the favourable conservation condition of Sea Lamprey in Killala Bay/ Moy Estuary SAC

Attributes & Targets:
Distribution: extent of anadromy - No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa.
Population structure of juveniles - Number of age/size groups.
Juvenile density in fine sediment - Juvenile density at least 1/m².

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Seal in Donegal Bay (Murvagh) SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.95km to the north of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Annual vegetation of drift lines [1210], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], Vertigo angustior (Narrow-mouthed Whorl Snail) [1014], Petromyzon marinus (Sea Lamprey) [1095].
- Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Estuaries [1130] **M** • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Annual vegetation of drift lines [1210] **M** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] **M** • Salicornia and other annuals colonising mud and sand [1310] **M**	Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Annual vegetation of drift lines [1210], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], Vertigo angustior

• Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **M** • Embryonic shifting dunes [2110] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Humid dune slacks [2190] **R** **Qualifying Interests (QI): Species** • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M** • Petromyzon marinus (Sea Lamprey) [1095] **M** • Phoca vitulina (Harbour Seal) [1365] **M**	(Narrow-mouthed Whorl Snail) [1014], Petromyzon marinus (Sea Lamprey) [1095] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required** The risk of disturbance effects on Phoca vitulina (Harbour Seal) [1365] associated with construction and operational activities applies. **Mitigation required**

18. AA Summary Matrix for Ballysadare Bay SAC (000622)

Ballysadare Bay SAC (000622) is located c.109km to the northeast of the site. Ballysadare Bay SAC | National Parks & Wildlife Service

Description of the Site: Ballysadare Bay extends for about 10 km westwards from the town of Ballysadare, Co. Sligo, and is the most southerly of three inlets of the larger Sligo Bay. The estuarine channel of the Ballysadare River winds its way through the bay, finally reaching the open sea near the spit at Strandhill dunes. The bay is underlain by sedimentary rocks of limestones, sandstones and shales, which are exposed as low cliffs and small sections of bedrock shore at several locations. Knocknarea Mountain overlooks the site.

According to the Site Synopsis for this SAC, Ballysadare Bay contains extensive intertidal sand and mudflats, approximately 1,500 ha in extent overall. The mud provides an abundance of food for wildfowl, in the form of colonising plants such as Eelgrass (Zostera marina) and Tasselweed (Ruppia maritima), as well as numerous species of invertebrates on which both wildfowl and waders feed. Well-developed salt marshes occur at several locations around the bay. Typical species of these areas are Sea Rush (Juncus maritimus), Saltmarsh Rush (Juncus gerardi), Creeping Bent (Agrostis stolonifera) and Parsley Water-dropwort

(Oenanthe lachenalii). In hollows and ditches, Sea Arrowgrass (Triglochin maritima), Sea Club-rush (Scirpus maritimus), Sea Milkwort (Glaux maritima), Thrift (Armeria maritima), Sea Plantain (Plantago maritima), Sea Aster (Aster tripolium) and Red Fescue (Festuca rubra) occur. Particularly interesting species found on the salt marshes are Flowering Rush (Butomus umbellatus), Slender Spike-rush (Eleocharis uniglumis) and Hard Grass (Parapholis strigosa).

There is a large sand dune system at Strandhill which has been relatively undisturbed by grazers. The dune system is highly dynamic, with the tip of the peninsula actively growing and displaying a good, though limited, example of embryonic shifting dunes. The characteristic species found in this habitat type include Sand Couch (Elymus farctus), Spear-leaved Orache (Atriplex prostrata) and Sea Rocket (Cakile maritima). Shifting marram dunes are fairly extensive in the area also, occurring along the entire seaward side of the spit, and they are especially active towards the tip. While Marram (Ammophila arenaria) is the dominant species, Colt'sfoot (Tussilago farfara), Red Goosefoot (Chenopodium rubrum) and Cat's-ear (Hypochoeris radicata) can also be found. The seaward dunes reach considerable heights (up to 20 m). They are very steep on the seaward edge, but to the east of this there is an undulating expanse of dune hills.

The largest proportion of the dune system is made up of fixed dunes, a priority habitat listed on Annex I of the E.U. Habitats Directive. Once one moves landward, in from the Marram dunes, there is a low-growing, closed sward which is particularly species-rich, with Field Wood-rush (Luzula campestris), Kidney Vetch (Anthyllis vulneraria), Bee Orchid (Ophrys apifera), Oxeye Daisy (Leucanthemum vulgare), Common Centuary (Centaurium erythraea), Wild Thyme (Thymus praecox), Harebell (Campanula rotundifolia), Burnet Rose (Rosa pimpinellifolia), Carline Thistle (Carlina vulgaris) and Fairy Flax (Linum catharticum). The fixed dune areas are also rich in bryophytes and lichens. Moss species include Tortula ruraliformis, Homalothecium lutescens, Ditrichum flexicaule and Hypnum cupressiforme, while lichens (Peltigera spp. and Cladonia spp.) are also present. Some humid dune slacks occur amongst the fixed dunes. Characteristic species include Creeping Willow (Salix repens), Carnation Sedge (Carex panicea), Jointed Rush (Juncus articulatus) and the relatively uncommon Marsh Helleborine (Epipactis palustris).

A range of habitats fringe the bay, adding diversity to the site as a whole. Some of these areas have particular features of interest, e.g. the old oyster farm at Tanrego is important for waterfowl, while the uncommon plant species Ivy Broomrape (Orobanche hederae) occurs in scrubland adjacent to the bay.

Two animals listed on Annex II of the E.U. Habitats Directive occur within the site: The Bay supports a colony of Common Seal (maximum count of 257 in the all-Ireland survey of 2003), and the rare snail, Vertigo angustior, occurs in dune slacks and hollows in the dunes at Strandhill.

Ballysadare Bay is important for a range of waterfowl species in autumn and winter and is part of the larger Sligo Bay complex. Brent Goose occur in internationally important numbers, while a further seven species have populations of national importance. These are as follows, with numbers referring to the average peaks

over winters 1994/95 - 1997/98: Brent Goose (259), Red-breasted Merganser (48), Oystercatcher (796), Grey Plover (231), Dunlin (1129), Bar-tailed Godwit (431), Redshank (481) and Greenshank (24). The presence of Bar-tailed Godwit, and also smaller numbers of Golden Plover (66), is of particular note as these species are listed on Annex I of the E.U. Birds Directive

The bay is little-used for fishing or boating, but marsh shooting is common in the upper reaches. Aquaculture is little-developed in this bay compared to nearby Sligo and Drumcliff Bays. Dune systems are sensitive to developments which alter their structure. Grazing is also a critical factor; the correct level of grazing maintains an open, species-rich sward, but the presence of too many grazers causes damage to the vegetation and may exacerbate dune erosion. Agricultural improvement, and particularly the application of fertilisers, threatens dune vegetation, leading to the eventual loss of species diversity.

Ballysadare Bay is of high ecological value for its range of good quality coastal habitats. Actively developing dune systems are rare on the west coast and the sand dune system at Strandhill is of particular interest as a large and intact example of a habitat type which is under general threat from development. The rarity of intact dune systems is recognised in the listing of fixed dunes as a priority habitat on Annex I of the E.U. Habitats Directive. The salt marshes at Ballysadare Bay are relatively good examples for the west coast, and that at Abbeytown is unusual as it is forming on quarry waste. The presence of two Annex II species within the site adds further importance. Furthermore, the bay supports nationally important numbers of waterfowl.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Estuaries [1130] **M**
- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Embryonic shifting dunes [2110] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Humid dune slacks [2190] **R**
- Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Estuaries [1130] **M**
Conservation Objective: To maintain the favourable conservation condition of Estuaries in Ballysadare Bay SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand with Angulus tenuis community complex; Muddy sand to sand with Hediste diversicolor, Corophium volutator and Peringia ulvae community complex; Fine sand with polychaetes community complex; Sand with bivalves, nematodes and crustaceans community complex; Intertidal reef community complex; Subtidal reef community complex.

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Ballysadare Bay SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand with Angulus tenuis community complex; Muddy sand to sand with Hediste diversicolor, Corophium volutator and Peringia ulvae community complex.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **M**
Conservation Objective: To maintain the favourable conservation condition of Embryonic shifting dunes in Ballysadare Bay SAC

Attributes & Targets:
Habitat area – Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch (Elytrigia juncea) and/or lyme- grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).

Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Harbour Seal in Ballysadare Bay SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses - 95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Ballysadare Bay SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.

Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Delaney et al. (2013).
Vegetation composition: negative indicator species (including Hippophae rhamnoides) - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Humid dune slacks [2190] **R**
Conservation Objective: To restore the favourable conservation condition of Humid dune slacks in Ballysadare Bay SAC

Attributes & Targets:
Habitat area – Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Delaney et al. (2013).
Vegetation composition: cover of Salix repens - Maintain more than 40% cover of creeping willow (Salix repens).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
Conservation Objective: To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Ballysadare Bay SAC

Attributes & Targets:
Distribution: occupied sites - No decline.
Presence on transect - Adult or sub-adult snails are present in all three of the habitat zones on the transect (minimum four samples).
Presence - Adult or sub-adult snails are present in at least six other places at the site with a wide geographical spread (minimum of eight sites sampled).
Transect habitat quality - More than 50m of habitat along the transect is classed as optimal and the remainder as at least sub-optimal.

Transect optimal wetness - Soils, at time of sampling, are damp (optimal wetness) and covered with a layer of humid thatch for more than 50m along the transect.
Habitat area - At least 45ha of the site in at least optimal/suboptimal condition. Optimal habitat is defined as fixed dune, species-rich grassland dominated by red fescue (Festuca rubra) and marram (Ammophila arenaria), with sparse oxeye daisy (Leucanthemum vulgare), dandelion (Taraxacum sp.), ribwort plantain (Plantago lanceolata) and other low growing herbs. Vegetation height 20- 50cm. Habitat growing on damp, friable soil covered with a layer of humid, open structured thatch. Sub-optimal habitat is defined as above but either vegetation height is less than 10cm or above 50cm; or the soil is dry and sandy; or the thatch is wetter with a denser structure.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Seal in Ballysadare Bay SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.109km to the northeast of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], and Vertigo angustior (Narrow-mouthed Whorl Snail) [1014].
- Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Estuaries [1130] **M** • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Embryonic shifting dunes [2110] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Humid dune slacks [2190] **R**	Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], and Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**
Qualifying Interests (QI): Species • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M** • Phoca vitulina (Harbour Seal) [1365] **M**	The risk of disturbance effects on Phoca vitulina (Harbour Seal) [1365] associated with construction and operational activities applies. **Mitigation required**

19. AA Summary Matrix for Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625)

Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625) c.130km to the northeast of the site
Bunduff Lough and Machair /Trawalua/ Mullaghmore SAC | National Parks & Wildlife Service

Description of the Site: This site is situated on the south side of Donegal Bay, 5 km south-west of Bundoran, and it falls in the counties of Sligo and Leitrim. The part of the site west of Mullaghmore Head is very exposed to the prevailing wind and swells from the Atlantic, whereas the head itself affords moderate shelter to the eastern part of the site. The underlying geology is of sedimentary rocks including limestone, shale and sandstone. Windblown sand is common in places, covering much of the underlying rocks and shingle.

According to the Site Synopsis for this SAC, Machair is common throughout the site, occurring mostly in the flat areas between dune ridges and areas of alkaline fen/marsh. Although areas with typical dry machair grassland can be found close to dunes ridges, much of the habitat is wetter than is usually seen, and there are large areas that are considered to be transitional to alkaline fen. Typical dry machair grassland species present include Red Fescue (Festuca rubra), Wild Thyme (Thymus praecox), Daisy (Bellis perennis), Ribwort Plantain (Plantago lanceolata), Common Bird's-foot-trefoil (Lotus corniculatus) and Lady's Bedstraw (Galium verum). The plant species indicative of fen conditions include Bog Pimpernel (Anagallis tenella), Flea Sedge (Carex pulicaris), Common Sedge (Carex nigra), Marsh Pennywort (Hydrocotyle vulgaris), Knotted Pearlwort (Sagina nodosa), Common Twayblade (Listera ovata), Ragged-Robin (Lychnis flos-cuculi) and Lesser Spearwort (Ranunculus flammula). Other notable fen species include Grass-ofparnassus (Parnassia palustris), Common Spotted-orchid (Dactylorhiza fuchsii) and the uncommon Marsh Helleborine (Epipactis palustris). Moss cover is well-developed, frequently attaining 90% cover. Typical species include Campylium stellatum, Scorpidium revolvens, Ctenidium molluscum, Calliergonella cuspidata and Philonotis fontana, most of which indicate the presence of wet, base-rich conditions. The fen vegetation is best developed to the south-west of the Bunduff Lough. These areas of wet machair/alkaline fen are very species-rich, often containing 40-50 plant species in an area of 4 m2 . The E.U. Habitats Directive Annex II liverwort species Petalophyllum ralfsii has recently been recorded from areas of machair within the site.

The fixed dune habitat is well represented at the site. Areas of fixed dunes with a high cover of herbs and mosses are found on the dune systems at both Bunduff strand and Trawalua. The habitat typically occurs as a prominent zone on gently sloping ground between the more exposed and species-poor white dune vegetation, and the flat areas of dune grassland that comprise the machair plains. The vegetation is typically dominated by Marram (Ammophila arenaria) and Red Fescue, and these are generally accompanied by species such as Lady's Bedstraw, Yorkshire-fog (Holcus lanatus), Ribwort Plantain, eyebrights (Euphrasia spp.), Wild Thyme, clovers (Trifolium spp.) and the mosses Rhytidiadelphus squarrosus, Homalothecium lutescens, Brachythecium albicans and Callergonella cuspidata. In addition, the distinctive lichen, Peltigera canina agg., is quite frequent. Other noteworthy components of the vegetation are Pyramidal Orchid (Anacamptis pyramidalis) and, occasionally, Bee Orchid (Ophrys apifera). At Bunduff, well back from the high dune areas, there are also extensive areas of fixed dune grassland without Marram, occurring on unusual low sandy mounds. These distinctive areas are dominated by mosses and with a high cover of Wild Thyme, Glaucous Sedge (Carex flacca) and Hairy Rock-cress (Arabis hirsuta). The rare parasitic plant, Dodder (Cuscuta epithymum) grows in close association with this moss-rich habitat.

There is a relatively large dune slack located behind the fixed dunes in the south of the Trawalua site. It is composed of low-growing Creeping willow (Salix repens) and is grazed by sheep and cattle. There are low, fixed dune ridges towards the back of the slack and in some places the slack grades into the machair. The dune slack vegetation is characterised by typical species such Glaucous sedge, Sand

sedge (Carex arenaria), Common sedge (Carex nigra), Marsh Pennywort, Water mint (Mentha aquatica), Lesser spearwort, Rush spp. (Juncus spp.), Common Marsh-bedstraw (Galium palustre), Silverweed (Potentilla anserina), Autumn Hawkbit (Leontodon autumnalis), Selfheal (Prunella vulgaris) and Yorkshire-fog.

Shifting dunes with Marram are best-developed at Trawlua in the south of the site. In exposed areas Marram is the only species present, however, further back species such as Colt's-foot (Tussilago farfara), Sand Couch (Elymus farctus), Sand Sedge and Common Ragwort (Senecio jacobaea) are found. Mosses are typically sparse.

Orchid-rich calcareous grassland is found in fragmentary form in a small area to the north of Bunduff Lough, where it forms a mosaic with heath and dune grassland.

Characteristic species include Kidney Vetch (Anthyllis vulneraria), Yellow-wort (Blackstonia perfoliata), Flea sedge, Quaking-grass (Briza media), Mountain Everlasting (Antennaria dioica), Frog Orchid (Coeloglossum viride), and many others.

Bunduff Lough is a shallow, sandy-bottomed lake situated at the back of the dunes and machair. The marginal vegetation of the lake is well-developed and dominated by Sea Club-rush (Scirpus maritimus), Common Reed (Phragmites australis), Bulrush (Typha latifolia) and Water Horsetail (Equisetum fluviatile). Where the substrate is stony and unable to support the reedswamp community, the margins of the lough are dominated by Amphibious Bistort (Polygonum amphibium). At the north-eastern end of the lough, where conditions are drier, wet grassland occurs. Here, Rough Meadow-grass (Poa trivialis), Yorkshire-fog, Soft Rush (Juncus effusus) and Marsh Cinquefoil (Potentilla palustris) are dominant.

Heath, dominated by Crowberry (Empetrum nigrum), occurs near Skerrydoo.

Trawalua Strand, a sandy beach, is backed by high Marram dunes and flat machair areas, similar to drier areas at Bunduff. These two dune areas are separated by Mullaghmore Point and Classiebawn Woods. Classiebawn Wood is a plantation woodland of Maritime Pine (Pinus pinaster) with a very interesting ground flora, including plants such as Marsh Helleborine, Broad-leaved Helleborine (E. helleborine), Common Twayblade and Fragrant Orchid (Gymnadenia conopsea). As is typical for a coastal site in Ireland, the site has a notable butterfly fauna including the E.U. Habitats Directive Annex II and red-listed (VU) Marsh Fritillary (Euphydryas aurinia). A colony is found in at least two locations in the machair and fixed dune grassland mosaic with the webs often placed on the low sandy mounds which remain unflooded during the winter. Other red-listed and near threatened species present are the Small Blue (Cupido minimus), Dingy Skipper (Erynnis tages), Small Heath (Coenonympha pamphilus) and Dark Green Fritillary (Argynnis aglaja) (VU).

The terrestrial and freshwater habitats support a rich and varied fauna in other insect groups. Notable species recorded from the site include the hoverflies Cheilosia ahenea, Paragus haemorrhous and Pipizella viduata, the moths

Parasemia plantaginis (Wood Tiger) and Adsticta statices (Forester), the dragonfly Orthetrum cancellatum (Black-tailed Skimmer) and the aquatic bugs Corixa panzeri and Arctocorisa germari. Two near threatened bumblebee species Bombus lapidarius and Bombus muscorum have been recorded.

The site features characteristic intertidal sediment communities which are often found in association with large bays. There is a well-developed zonation of benthic communities and high species-richness in the littoral sediments. In places the low shore is dominated by the burrowing urchin Echionocardium cordatum, with razor shell species (Ensis siliqua and E. ensis) abundant. The exposed rocky shore is of interest from both ecological and geological viewpoints. Marine invertebrates present include the Purple Sea Urchin (Paracentrotus lividus).

Bunduff Lough is locally important for waterfowl. In winter, Whooper Swan (57), Teal (64) and Mallard (61) are regular, along with Golden Plover (150) at certain times (figures are average maxima for winters 1994/95 to 1995/96). Resident species include Coot, Water Rail, Mute Swan and Little Grebe. Both Whooper Swan and Golden Plover are listed on Annex I of the E.U. Birds Directive. The site also provides habitat for breeding waders, notably Lapwing (16 pairs in 1996) and Snipe (5 pairs in 1996). Shag, Fulmar, Raven and Chough are all reported from the cliffs at this site.

The machair and dunes within this site are grazed by sheep and cattle. Amenity use close to Mullaghmore village is high, with fishing and shooting also occurring nearby. Bunduff Strand is a busy recreational beach and water sports are popular here. A sewage discharge at Thumb Rock may be having a deleterious effect on water quality and sediment communities.

This extensive coastal site contains a good range of habitats, including several listed on Annex I of the E.U. Habitats Directive, and three which are listed with priority status. The machair found on the site is of particular importance because of how it grades into wet fen-like vegetation, and because it is intact and has not been sub-divided by fences, which is commonly seen at other sites.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Humid dune slacks [2190] **M***
- Machairs (* in Ireland) [21A0] **M**

- Juniperus communis formations on heaths or calcareous grasslands [5130] **M**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
- Alkaline fens [7230] **M**
- Euphydryas aurinia (Marsh Fritillary) [1065] **M***
- Phocoena phocoena (Harbour Porpoise) [1351] **M***
- Petalophyllum ralfsii (Petalwort) [1395] **M**

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Fine to very fine sand community complex.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Fine to very fine sand community complex; Intertidal reef community complex; Laminaria-dominated community complex.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Intertidal reef community complex; Laminaria-dominated community complex.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses – More than 95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species (including Hippophae rhamnoides) - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Humid dune slacks [2190] **M***
Conservation Objective: To maintain the favourable conservation condition of Humid dune slacks in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **M**
Conservation Objective: To maintain the favourable conservation condition of Machairs in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of machair habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species (including Hippophae rhamnoides) - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.
Vegetation composition: bryophytes - Should always be at least an occasional component of the vegetation.

Qualifying Interests Feature: Juniperus communis formations on heaths or calcareous grasslands [5130] **M**
Conservation Objective: To restore the favourable conservation condition of Juniperus communis formations on heaths or calcareous grasslands in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Juniper population size - At least 50 plants per formation.

Vegetation composition: typical species - At least 50% of the listed positive indicator species for the relevant vegetation group present.
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.
Vegetation structure: cone-bearing plan - At least 10% of juniper plants are bearing cones.
Vegetation structure: seedling recruitment - At least 10% of juniper plants are seedlings.
Vegetation structure: dead juniper - Mean percentage of each juniper plant dead less than 10%.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
Conservation Objective: To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken (Pteridium aquilinum) - Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Alkaline fens [7230] **M**
Conservation Objective: To maintain the favourable conservation condition of Alkaline fens in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.

Hydrological regime - Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Peat formation - Active peat formation, where appropriate.
Water quality: nutrients - Appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%.
Physical structure: drainage - Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%.

Qualifying Interests Feature: Euphydryas aurinia (Marsh Fritillary) [1065] **M***
Conservation Objective: To maintain the favourable conservation condition of Marsh Fritillary in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Phocoena phocoena (Harbour Porpoise) [1351] **M***
Conservation Objective: To maintain the favourable conservation condition of Harbour Porpoise in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Petalophyllum ralfsii (Petalwort) [1395] **M**
Conservation Objective: To maintain the favourable conservation condition of Petalwort in Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC

Attributes & Targets:
Distribution of populations - No decline.
Population size - No decline.
Area of suitable habitat - No decline.
Hydrological conditions: soil moisture - Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter.
Vegetation: open structure - Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.130km to the northeast of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Mudflats and sandflats not covered by seawater at low tide [1140], Large shallow inlets and bays [1160], Reefs [1170], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], Machairs (* in Ireland) [21A0], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Alkaline fens [7230], Petalophyllum ralfsii (Petalwort) [1395] and Euphydryas aurinia (Marsh Fritillary) [1065].
- Phocoena phocoena (Harbour Porpoise) [1351] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Large shallow inlets and bays [1160] **M** • Reefs [1170] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Humid dune slacks [2190] **M*** • Machairs (* in Ireland) [21A0] **M** • Juniperus communis formations on heaths or calcareous grasslands [5130] **M** • Semi-natural dry grasslands and scrubland facies on calcareous	Mudflats and sandflats not covered by seawater at low tide [1140], Large shallow inlets and bays [1160], Reefs [1170], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Humid dune slacks [2190], Machairs (* in Ireland) [21A0], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Alkaline fens [7230], Petalophyllum ralfsii (Petalwort) [1395] and Euphydryas aurinia (Marsh Fritillary) [1065] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the

substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M** • Alkaline fens [7230] **M** • Petalophyllum ralfsii (Petalwort) [1395] **M** **Qualifying Interests (QI): Species** • Euphydryas aurinia (Marsh Fritillary) [1065] **M*** • Phocoena phocoena (Harbour Porpoise) [1351] **M***	distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required** The risk of disturbance effects on Phocoena phocoena (Harbour Porpoise) [1351] associated with construction and operational activities applies. **Mitigation required**

20. AA Summary Matrix for Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627)

Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627) is located c.118km to the northeast of the site
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC | National Parks & Wildlife Service

Description of the Site: This large coastal site extends from Cullamore in the north-west to Killaspug in the south-west, and from Sligo town in the south-east to Drumcliff village in the northeast. It encompasses two large, shallow bays, Drumcliff Bay and Sligo Harbour, and both Ardboline and Horse Island. Sand dunes and sand hills at Rosses Point, Killaspug, Yellow Strand and Coney Island are included, as are grasslands at Ballintemple and Ballygilgan (Lissadell), along with a variety of other habitats such as woodland, saltmarsh, sandy beaches, boulder beaches, shingle, fen, freshwater marshes, rocky sea cliffs and lakes. The site is largely underlain by Carboniferous limestone, but acidic rocks are also found on the Rosses Point peninsula. At Serpent Rock in the north-western section of the site the most complete section of the northwestern Carboniferous strata is exposed. Here are found an excellent series of fossilised corals which, in some strata, stand out from the rock matrix.

According to the Site Synopsis for this SAC, the dominant habitats on the site are estuaries and intertidal sand and mud flats. Sligo Harbour receives the waters of the Garavogue River, which flows from Lough Gill, while Drumcliff Bay receives the Drumcliff River which flows from Glencar Lough. At low tide extensive areas of intertidal flats are exposed in both of these sheltered estuarine bays. The intertidal flats support a diverse macrofauna, with invertebrate species such as lugworm (Arenicola marina), common cockle (Cerastoderma edule), sand mason worm (Lanice conchilega), Baltic tellin (Macoma balthica), spire shell (Hydrobia ulvae) and common mussel (Mytilus edulis) being frequent. Of particular note is the

presence of the eelgrasses Zostera noltii and Z. angustifolia beds in both bays. Areas of saltmarsh fringe both bays in places.

Sand dune habitats are rare and threatened in Europe and three types are found in this site - embryonic dunes, Marram (Ammophila arenaria) dunes and fixed dunes. Embryonic dunes, with characteristic species including Sand Couch (Elymus farctus), occur at the southern end of the sand spit at Rosses Point. Shifting Marram dunes are found in a number of locations, including Rosses Point, Strandhill, Coney Island and Yellow Strand. In the latter three areas, the areas of shifting dunes are linked at least to some extend to recent disturbance (e.g. erosion, storm breaches, etc.).

Fixed dune grassland is found behind Yellow Strand, and the main species are Sand Sedge (Carex arenaria) and Smooth Meadow-grass (Poa pratensis), with associated species including Lady's Bedstraw (Galium verum), Mouse-ear Hawkweed (Hieracium pilosella), Common Milkwort (Polygala vulgaris), Common Dog-violet (Viola riviniana), Mountain Everlasting (Antennaria dioica), Common Spotted-orchid (Dactylorhiza fuchsii), Early Marsh-orchid (D. incarnata), Frog Orchid (Coeloglossum viride) and Autumn Lady's-tresses (Spiranthes spiralis). Some areas of fixed dune at the site are suffering from under-grazing (e.g. north of Strandhill), and have a rank vegetation dominated by Marram, with species such as Red Fescue (Festuca rubra), Creeping Willow (Salix repens), Daisy (Bellis perennis) and Wild Thyme (Thymus praecox) also occurring. A relatively species-poor example of the habitat is found at Rosses Point, but typical species like Marram, Red Fescue, Lady's Bedstraw, Harebell (Campanula rotundifolia), Kidney Vetch (Anthyllis vulneraria) and Common Mouse-ear (Cerastium fontanum) do occur here.

An area with Juniper (Juniperus communis) scrub is found on a gravel hill with species-rich fixed dune vegetation. Other species present in this area include Marram, Autumn Gentian (Gentianella amarella), Red Fescue, Lady's Bedstraw, Common Bird's-foot-trefoil, Harebell, Yellow-wort (Blackstonia perfoliata), Thyme-leaved Sandwort (Arenaria serpyllifolia), Common Whitlowgrass (Erophila verna), Hoary Whitlowgrass (Draba incana), Devil's-bit Scabious (Succisa pratensis) and Early Hair-grass (Aira praecox). An area of approximately 3.7 hectares of Orchid-rich Calcareous Grassland, a habitat listed with priority status on Annex I of the E.U. Habitats Directive, is reported to occur near Rosses Point, according to the Irish Semi-natural Grasslands Survey, 2010.

Wetlands on the site include Doonweelin Lake, a freshwater lake on the Rosses Point peninsula, which supports interesting vegetation communities that reflect the juxtaposition of the underlying acidic and basic rocks. Ardtermon Fen, a small, floristically-rich area of freshwater marsh, swamp, wet grassland and fen is situated at the back of the Yellow Strand sand hills.

The site includes small areas of Hazel (Corylus avellana) and Ash (Fraxinus excelsior) woodland on limestone (e.g. Cummeen Wood), and several other stands of mixed woodland and wet willow (Salix spp.) woodland (as at Ardtermon Fen).

Cliff-top grassland is common in the north-western part of the site. This is typically dominated by Red Fescue and White Clover (Trifolium repens), with associated species including Daisy, Common Bird's-foot-trefoil (Lotus corniculatus), plantains (Plantago coronopus, P. lanceolata and P. maritima), Bulbous Buttercup (Ranunculus bulbosus), Common Scurvygrass (Cochlearia officinalis), Field Wood-rush (Luzula campestris) and Spring Sedge (Carex caryophyllea).

The site has a good example of petrifying springs with tufa formations, with several species of bryophyte typical of the Cratoneurion. The springs occur along seepage zones in clay sea cliffs on the northern side of Sligo Harbour.

The site has a very rich and diverse flora, on account of the wide variety of habitats found, and the presence of both basic and acidic substrates. Several rare, Red Data Book species have been recorded from the site, including Rough Poppy (Papaver hybridum) which is also listed under the Flora (Protection) Order, 2015, Hoary Whitlowgrass and Yellow Saxifrage (Saxifraga aizoides).

Both Drumcliff Bay and Cummeen Strand are important for the large numbers of waterfowl which use them in autumn/winter, including Ringed Plover, Redshank, Lapwing, Knot, Bar-tailed Godwit, Oystercatcher, Curlew, Golden Plover, Dunlin, Turnstone, Brent Goose, Grey Heron, Teal, Wigeon, Mallard, Shelduck and Red-breasted Merganser. The fields at Lissadell and Ballintemple support one of the largest populations of Barnacle Goose in the country (c. 2,000 in winters of 1995/96 and 1996/97). Both Drumcliff Bay and Cummeen Strand have been designated as Special Protection Areas under the E.U. Birds Directive. The important feeding site for Barnacle Goose at Lissadell is a Statutory Nature Reserve.

The islands in the north-western section of the site hold important seabird colonies. A Cormorant colony of national importance occurs on Ardboline and Horse Islands, with a total of 261 pairs in 1998. Herring Gull and Great Black-backed Gull also breed on both islands. Common Tern formerly bred on both islands. The islands are also used by Barnacle Goose from the adjacent mainland, which roost or seek refuge here. The low sea cliffs on the adjacent mainland at Ballyconnell and Roskeeragh Points also support small numbers of seabirds, and both Black Guillemot and Fulmar nest there. Choughs feed in the sandy/grassy areas of the site and one pair is known to nest. Several of the bird species that use the site are listed on Annex I of the E.U. Birds Directive, i.e. Barnacle Goose, Chough, Golden Plover and Bar-tailed Godwit.

At least five species listed on Annex II of the E.U. Habitats Directive are found within this site. Drumcliff Bay is important for the presence of a breeding population of Common Seal. Ardboline and Horse Islands on the western side of the site are also important as haul-out areas for this species. A minimum population of 12–15 individuals was estimated from counts made in various month in 2007 and 2008. Sea Lamprey and River Lamprey have been recorded in the Garavogue River, and River Lamprey are also known from further upstream in the tributaries of Lough Gill. The Marsh Fritillary butterfly is found at Rosses Point, while the rare snail Vertigo angustior has recently been recorded from sand dunes at Killaspugbrone.

Cummeen Strand/Drumcliff Bay (Sligo Bay) is an important site of high conservation significance, which includes a wide variety of habitat types, including several listed on Annex I of the E.U. Habitats Directive, several species listed on Annex II of this Directive, large and important populations of waterfowl and seabirds, and several rare plant species.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Estuaries [1130] **M**
- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Embryonic shifting dunes [2110] **M**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
- Juniperus communis formations on heaths or calcareous grasslands [5130] **R**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R**
- Petrifying springs with tufa formation (Cratoneurion) [7220] **M**
- Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
- Petromyzon marinus (Sea Lamprey) [1095] **R**
- Lampetra fluviatilis (River Lamprey) [1099] **M**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Estuaries [1130] **M**
Conservation Objective: To maintain the favourable conservation condition of Estuaries in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community and the Mytilidae-dominated community complex, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community structure: Mytilus edulis density - Conserve the high quality of the Mytilidae-dominated community complex, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal fine sand with Peringia ulvae and Pygospio elegans community complex; Estuarine mixed sediment to sandy mud with Hediste diversicolor and oligochaetes community complex; Fine sand with Angulus spp. and Nephtys spp.

community complex; Sand to mixed sediment with amphipods community; Intertidal reef community.

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated community and the Mytilidae-dominated community complex, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community, subject to natural processes.
Community structure: Mytilus edulis density - Conserve the high quality of the Mytilidae-dominated community complex, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal fine sand with Peringia ulvae and Pygospio elegans community complex; Estuarine mixed sediment to sandy mud with Hediste diversicolor and oligochaetes community complex; Fine sand with crustaceans and Scololepis (Scololepis) squamata community complex; Fine sand with Angulus spp. and Nephtys spp. community complex.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **M**
Conservation Objective: To maintain the favourable conservation condition of Embryonic shifting dunes in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area – Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of sand couch (Elytrigia juncea) and/or lyme- grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses - 95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R**
Conservation Objective: To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - Area increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.
Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Ryle et al. (2009).
Vegetation composition: negative indicator species (including Hippophae rhamnoides) - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: scrub/trees - No more than 5% cover or under control.

Qualifying Interests Feature: Juniperus communis formations on heaths or calcareous grasslands [5130] **R**
Conservation Objective: To restore the favourable conservation condition of Juniperus communis formations on heaths or calcareous grasslands in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Formation area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline.
Juniper population size - At least 50 plants per formation.
Formation structure: cover and height - Well-developed structure with an open to closed cover of juniper up to or exceeding 0.45m in height with associated species.
Formation structure: community diversity and extent - Appropriate community diversity and extent.
Formation structure: cone-bearing plant - At least 10% of plants bearing cones.
Formation structure: seedling recruitment - At least 10% of juniper plants within the formation are seedlings.
Formation structure: amount of each plant dead - Mean percentage of each juniper plant dead not more than 10%.
Vegetation composition: typical species - A variety of typical native species with a minimum of 10 species present (excluding negative indicator species.
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R**
Conservation Objective: To restore the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: positive indicator species - At least seven positive indicator species present in monitoring stop or, if five to six present in stop, additional species within 20m of stop; this includes at least two 'high quality' positive indicator species present in stop or within 20m of stop.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover of an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5%.

Vegetation structure: broadleaf herb:grass ratio - Broadleaf herb component of vegetation between 40% and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: grazing or disturbance - Area of the habitat showing signs of serious grazing or disturbance less than 20m^2.

Qualifying Interests Feature: Petrifying springs with tufa formation (Cratoneurion) [7220] **M**
Conservation Objective: To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline.
Hydrological regime: height of water table; water flow - Maintain appropriate hydrological regimes.
Water quality - Maintain oligotrophic and calcareous conditions.
Vegetation composition: typical species - Maintain typical species.

Qualifying Interests Feature: Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M**
Conservation Objective: To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Distribution: occupied sites - No decline.
Presence on transect - Adult or sub-adult snails are present in four of the grassland zones on the transect where optimal or sub-optimal habitat occurs (minimum 5 samples).
Presence - Adult or sub-adult snails are present in at least 6 other places at the site with a wide geographical spread (minimum of 8 sites or 75% of sites sampled).
Transect habitat quality - At least 75m of habitat along the transect is classed as optimal and 150m of habitat along the transect is classed as sub-optimal or optimal.
Transect optimal wetness - Soils, at time of sampling, are damp (optimal wetness) and covered with a layer of humid thatch for more than 130m along the transect.
Habitat extent - 12-15ha of the site optimal and a further 11-14ha sub-optimal. Optimal habitat is defined as fixed dune, species-rich grassland dominated by red fescue (Festuca rubra), with sparse marram grass (Ammophila arenaria), lady's bedstraw (Galium verum), eyebright (Euphrasia sp.), mouseear-hawkweed (Pilosella officinarum) and other low growing herbs. Vegetation height 10-30cm. Habitat growing on damp, friable soil covered with a layer of humid, open structured thatch. Sub-optimal habitat is defined as for optimal but either

vegetation height is less than 10cm or between 30 and 50cm; or the vegetation contains mounds of moss or willow (Salix spp.) scrub; or the soil is dry and sandy; or the thatch is wetter with a denser structure.

Qualifying Interests Feature: Petromyzon marinus (Sea Lamprey) [1095] **R**
Conservation Objective: To restore the favourable conservation condition of Sea Lamprey in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Distribution: extent of anadromy - No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa.

Qualifying Interests Feature: Lampetra fluviatilis (River Lamprey) [1099] **M**
Conservation Objective: To maintain the favourable conservation condition of River Lamprey in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Distribution: extent of anadromy - No barriers for migratory life stages of lamprey moving from freshwater to marine habitats and vice versa.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Seal in Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - Conserve the breeding sites in a natural condition.
Moulting behaviour - Conserve the moult haul-out sites in a natural condition.
Resting behaviour - Conserve the resting haul-out sites in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.118km to the northeast of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Petrifying springs with tufa formation (Cratoneurion) [7220], Vertigo angustior (Narrow-

mouthed Whorl Snail) [1014], Petromyzon marinus (Sea Lamprey) [1095], and Lampetra fluviatilis (River Lamprey) [1099].

- Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Habitats • Estuaries [1130] **M** • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Embryonic shifting dunes [2110] **M** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] **R** • Juniperus communis formations on heaths or calcareous grasslands [5130] **R** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **R** • Petrifying springs with tufa formation (Cratoneurion) [7220] **M**	Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210], Petrifying springs with tufa formation (Cratoneurion) [7220], Vertigo angustior (Narrow-mouthed Whorl Snail) [1014], Petromyzon marinus (Sea Lamprey) [1095], and Lampetra fluviatilis (River Lamprey) [1099] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **<u>No mitigation required</u>**
Qualifying Interests (QI): Species • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **M** • Petromyzon marinus (Sea Lamprey) [1095] **R** • Lampetra fluviatilis (River Lamprey) [1099] **M**	The risk of disturbance effects on Phoca vitulina (Harbour Seal) [1365] associated with construction and operational activities applies. **<u>Mitigation required</u>**

• Phoca vitulina (Harbour Seal) [1365] **M**	

21. AA Summary Matrix for Clew Bay Complex SAC (001482)

Clew Bay Complex SAC (001482) is located c.67km to the northwest of the site
Clew Bay Complex SAC | National Parks & Wildlife Service

Description of the Site: Clew Bay is a wide, west-facing bay on the west coast of Co. Mayo. It is open to the westerly swells and winds from the Atlantic, with Clare Island giving only a small amount of protection. This drumlin landscape was formed during the last glacial period when sediments were laid down and smoothed over by advancing ice. The sea has subsequently inundated the area, creating a multitude of islands. The geomorphology of the bay has resulted in a complex series of interlocking bays creating a wide variety of marine and terrestrial habitats.

Within the shallow bay, subtidal sediments are characterised by typical bivalve communities in fine sand (Chamelea striatula and Ensis sp.), and by the polychaete worm Euclymene sp. and the bivalve Thyasira flexuosa in muddy sand. The intertidal sediment communities are characterised by polychaetes and bivalves in the mid shore and by the sand mason worm Lanice conchilega in the low shore. In areas where there is maerl debris with small amounts of live maerl, the infaunal community has a mixture of species characteristic of coarse sand (e.g. the bivalves Timoclea ovata, Spisula sp., and the polychaetes Nepthys cirrosa and Glycera lapidum) and medium sand (e.g., the bivalve Ensis sp. and the polychaetes Lanice conchilega, Scoloplos armiger and Sthenelais boa). The bivalves Timoclea ovata, Tapes rhomboides and the polychaetes Branchiomma bombyx and Glycera lapidum are typical of gravels and medium sands, whereas the bivalves Abra alba, Corbula gibba, Thyasira flexuosa and Mysella bidentata and the polychaete Euclymene are characteristic of muddy sands. Beds of live maerl of Lithothamnion corallioides are also present in a number of areas.

Around the edges of the inner part of the bay are shores of mixed boulders, cobbles, gravel with some sand and mud. They have a typical zonation of intertidal communities found on sheltered shores of mixed substratum. The shore at Murisk is unusual as a distinct zone characterised by archiannelids occurs above the sandhopper zone in the upper shore under the boulders and cobbles. This is an unusual habitat. In sheltered areas of shallow water with little sand scour a welldeveloped community of hydroids, sponges and solitary sea squirts is present. Where the sediments include gravel and mud the species richness in the area can be exceptionally high (180 species). A number of marine species that are rarely recorded are found in Clew Bay: the stalked jellyfish Lucernariopsis cruxmelitensis;

the polycheates Anitides rosea, Clymenura clypeata, Pterosyllis formosa and Pionosylis sp. and the snail Clypterea chinensis.

According to the Site Synopsis for this SAC, Clew Bay is considered to have the most significant shingle reserves in the country, and has (on the islands) the only examples of incipient gravel barriers in Ireland. Associated with the shingle (and dunes) are good examples of annual vegetation of drift lines. Characteristic species found in these habitats include: Spear-leaved Orache (Atriplex prostrata), Red Fescue (Festuca rubra), Sea Sandwort (Honkenya peploides), Thrift (Armeria maritima), Common Scurvygrass (Cochlearia officinalis), Sea Mayweed (Matricaria maritima) and Sea Campion (Silene vulgaris subsp. maritima).

Lough Furnace is located at the north-eastern corner of Clew Bay. The lough is a good example of a deep, stratified, saline lake lagoon in a very natural state. Salinity levels can vary considerably here depending on rainfall and tides. The lake is one of the very few permanently stratified lakes known in Ireland and Britain. The lake is ringed by Common Reed (Phragmites australis) and Common Club-rush (Scirpus lacustris), with small patches of Great Fen-sedge (Cladium mariscus) and Bottle Sedge (Carex rostrata). Lough Furnace supports a relatively high faunal diversity (41 taxa recorded in a 1996 survey), including a number of important invertebrate species. The relict mysid species Neomysis integer, the isopods Jaera albifrons, J. ischiosetosa and J. nordmanni, and two rare amphipods (Lembos longipes and Leptocheirus pilosus) have all been recorded from the lake. Both Irish species of tasselweed (Ruppia maritima and R. cirrhosa) occur in the lagoon. Eel, Flounder and Mullet also occur in the lake waters. Mallard nest around the lough, while Saint's Island contains nesting Black-headed Gull.

At the north-western end of Lough Furnace lie two associated lakes, Lough Napransky and Lough Navroony. A stream drains from the latter into the main lake. The area contains flush and quaking-mire vegetation, which is of interest as Irish Heath (Erica erigena) is found there, with bog mosses (Sphagnum spp.), Black Bogrush (Schoenus nigricans), Bog Asphodel (Narthecium ossifragum), Common Cottongrass (Eriophorum angustifolium) and Round-leaved Sundew (Drosera rotundifolia). Bog Orchid (Hammarbya paludosa), a species listed in the Irish Red Data Book and the Flora (Protection) Order, 2015, is also found in this area. Beyond the wet area there is a Hazel (Corylus avellana) dominated woodland growing over abandoned fields. Downy Birch (Betula pubescens), Hawthorn (Crataegus monogyna) and Holly (Ilex aquifolium) are common, with occasional Sessile Oak (Quercus petraea). The ground flora contains such species as Bluebell (Hyacinthoides non-scripta), Sanicle (Sanicula europaea) and Wood-sorrel (Oxalis acetosella).

Keeloges Wood is a medium-sized woodland on the north-east corner of Clew Bay. The woodland lies in a sheltered location between several drumlins and occurs on a shallow, moist, brown-earth soil with an organic-rich A horizon which is occasionally peaty. The soil is gleyed near streams and flushes. The woodland is dominated by Sessile Oak, with Downy Birch and occasional Ash (Fraxinus excelsior). Hazel, Holly and Hawthorn are the principal components of the shrub layer. In moister sites Rusty Willow (Salix cinerea subsp. oleifolia) and Alder (Alnus glutinosa) occur. The woodland is at the more fertile end of the spectrum of

oak woodlands and is transitional to Ash woodland. Consequently the field layer is species-rich. Elements of oak woodland, e.g. Hard Fern (Blechnum spicant), Greater Stitchwort (Stellaria holostea), Great Wood-rush (Luzula sylvatica) and Honeysuckle (Lonicera periclymenum), are mixed with elements of Ash woodland, e.g. False Brome (Brachypodium sylvaticum), Lords-and-ladies (Arum maculatum), Enchanter'snightshade (Circaea lutetiana) and Wood Speedwell (Veronica montana), as well as indicators of poorly-drained soil, e.g. Tufted Hair-grass (Deschampsia cespitosa), Meadowsweet (Filipendula ulmaria) and Marsh Hawk's-beard (Crepis paludosa). The epiphyte Lobaria pulmonaria is also present, together with numerous other lichen and bryophyte species (including Usnea spp).

The wood was cut during the second World War so most of the trees are approximately 60 years old, but a few very much larger oaks occur, principally on the shoreline. There is a low but well-developed canopy with a well-developed shrub layer and often luxuriant field layer. There is good regeneration of trees. A most unusual feature is the juxtaposition of oak woodland with saltmarsh where the woodland borders the shoreline. The wood has been well-managed in recent times with occasional filling in of wind-blown coupes with trees derived from seed collected on-site. A stock-proof fence has been maintained along the land boundary. No invasive exotics were encountered during recent survey. The woodland appears on the 1st Edition Ordnance Survey map indicating that it is long-established and possibly ancient. The species-list also supports this contention with at least 14 species present here which have been found to be significantly more frequent in potentially ancient woodlands. This woodland is of particular significance in view of its location in the extreme north-west of the country where there is very little woodland, its position on the coast, its species-richness, excellent structure and its possible ancient status.

The Rosmurrevagh area in the north of Clew Bay displays a high diversity of habitats, from seashore to dunes, machair and coastal grassland, as well as saltmarsh, bog and fen. The sandy beach on the seaward side grades into dunes of Marram (Ammophila arenaria). Adjacent to this, the saltmarsh vegetation, which is approximately 5 m wide, comprises Thrift, Common Scurvygrass, Common Saltmarsh-grass (Puccinellia maritima) and 'turf fucoids' (diminutive forms of brown algae). These plant species are typical of Atlantic salt meadows. Similar saltmarshes occur scattered around the entire shoreline of the bay.

Next to the saltmarsh at Rosmurrevagh is an area of coastal grassland and machair. The majority of the machair grassland is relatively level and occurs on a fine sand substrate that is free draining. Small patches of damp machair are often found in conjunction with the saltmarsh or low-lying depressions where water from incoming high tides occasionally reaches. Many typical grassland species such as Festuca rubra (Red fescue), Bellis perennis (Daisy), and Plantago lanceolata (Ribwort plantain) are found on the machair. Autumn lady's-tress (Spiranthes spiralis) and Field Gentian (Gentianella campestris) are occasional in the grassland sward. Flushes introduce a species-rich bog/fen type vegetation. Yellow Iris (Iris pseudacorus), Soft Rush (Juncus effusus), Irish Heath, bog mosses, sedges, Water Mint (Mentha aquatica), Bog-myrtle (Myrica gale), Bog Asphodel and Cuckooflower (Cardamine pratensis) are also found.

A further dune system occurs at Bartraw in the south-west of the site. Here Marram and embryonic dunes occur along a shingle ridge which links a small island where dunes also occur. Embryonic dunes, characterised by the presence of Sand Couch (Elymus farctus), also occur on some of the islands in the bay.

Important populations of Otter and Common (Harbour) Seal are found in Clew Bay. A total of 95 Common Seals were recorded ashore within Clew Bay Complex SAC in August 2003 during a national aerial survey for the species. Continued land-based monitoring within the site recorded 121 seals of all ages ashore in August 2009 and 118 in August 2010. The snail species Vertigo geyeri, which is also listed on Annex II of the E.U. Habitats Directive, has been recorded from this site based on a finding of the species at the edge of a lagoon at Rosmoney, as reported in 2005. The Vertigo monitoring survey of 2008-2010 assessed the site as having very little suitable habitat and that this was a natural situation rather than due to loss of habitat. This was the only site for Vertigo geyeri in this SAC and no others have been found.

The Clew Bay Complex supports a good diversity of wintering waterfowl, with nationally important numbers of Red-breasted Merganser (average maximum of 70 in the winters 1995/96-1999/00) and Ringed Plover (average maximum of 142 in the winters 1995/96-1999/00). A population of Barnacle Goose (100-200 birds) frequents the islands during winter. Other species which occur in significant numbers include Great Northern Diver (14), Brent Goose (118), Shelduck (74), Wigeon (112), Teal (127), Mallard (64), Oystercatcher (250), Dunlin (450), Bar-tailed Godwit (73), Curlew (373), Redshank (172), Greenshank (10) and Turnstone (27) (all figures are average maxima for the winters 1995/95-1999/00). Species which breed in important numbers include Cormorant (115 pairs in 1985), Common Tern (20+ pairs in 2000/01), Arctic Tern (100+ pairs in 2000/01) and Little Tern (9 pairs in 2000). The various tern species, as well as Barnacle Goose, Great Northern Diver and Bar-tailed Godwit, are listed on Annex I of the E.U. Birds Directive.

The juxtaposition within Clew Bay of a wide variety of habitats, including 10 listed on Annex I of the E.U. Habitats Directive, and the combination of important flora and fauna, including one Red Data Book plant and two animals listed on Annex II of the E.U. Habitats Directive, make this a site of considerable national and international importance.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Mudflats and sandflats not covered by seawater at low tide [1140] **M**
- Coastal lagoons [1150] **M**
- Large shallow inlets and bays [1160] **M**
- Annual vegetation of drift lines [1210] **M**
- Perennial vegetation of stony banks [1220] **M**

- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
- Embryonic shifting dunes [2110] **R**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Machairs (* in Ireland) [21A0] **M***
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M***
- Lutra lutra (Otter) [1355] **R**
- Vertigo geyeri (Geyer's whorl snail) [1013] **Under review**
- Phoca vitulina (Harbour Seal) [1365] **M**

Qualifying Interests Feature: Mudflats and sandflats not covered by seawater at low tide [1140] **M**
Conservation Objective: To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution - The following sediment communities should be maintained in a natural condition: Intertidal sandy mud with Tubificoides benedii and Pygospio elegans community complex; Sandy mud with polychaetes and bivalves community complex; and Fine sand dominated by Nephtys cirrosa community.

Qualifying Interests Feature: Coastal lagoons [1150] **M**
Conservation Objective: To maintain the favourable conservation condition of Coastal lagoons in Clew Bay Complex SAC

Attributes & Targets:
Habitat distribution Habitat distribution - No decline, subject to natural processes.
Habitat area - Area stable, subject to slight natural variation.
Salinity regime - Maintain current spatial and temporal variation in salinity regime.
Hydrological regime - Maintain current annual water level fluctuations.
Hydrological regime - Maintain/restore freshwater discharge regime.
Barrier - Maintain current weir structure at Furnace Lough to ensure maintenance of the current salinity regime.
Water quality: chlorophyll *a* - Maintain annual median chlorophyll in Furnace Lough at less than 2.5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Maintain annual median MRP in Furnace Lough at less than 0.01mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Maintain annual median DIN (Dissolved inorganic nitrogen) in Furnace Lough at less than 0.15mg/L.
Water quality: Biological Oxygen Demand (BOD) - Maintain annual median BOD (Biological Oxygen Demand) in Furnace Lough at less than 2.0mg/L.

Depth of submergent macrophyte colonisation - Maintain/increase the depth of submergent macrophyte colonisation of the lagoon.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the natural extent of the Zostera dominated and maërl dominated communities.
Shoot density - Maintain the high quality of Zostera dominated community.
Community structure - Maintain the high quality of maërl dominated communities.
Community distribution - The following communities should be maintained in a natural condition: Sandy mud with polychaetes and bivalves community complex; Fine sand dominated by Nephtys cirrosa community; Intertidal sandy mud with Tubificoides benedii and Pygospio elegans community complex; Shingle; and Reef.

Qualifying Interests Feature: Annual vegetation of drift lines [1210] **M**
Conservation Objective: To maintain the favourable conservation condition of Annual vegetation of drift lines in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: Cakile maritima, Honckenya peploides, Salsola kali and Atriplex spp.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Perennial vegetation of stony banks [1220] **M**
Conservation Objective: To maintain the favourable conservation condition of Perennial vegetation of stony banks in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: Functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
Conservation Objective: To maintain the favourable conservation condition of Atlantic salt meadows in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply - Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans - Maintain creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009).
Vegetation structure: negative indicator species - Spartina anglica - No significant expansion of Spartina. No new sites for this species and an annual spread of less than 1% where it is already known to occur.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **R**
Conservation Objective: To restore the favourable conservation condition of Embryonic shifting dunes in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply – Maintain the natural circulation of sediments and organic matter, without any physical obstructions.

Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses - More than 95% of Elytrigia and/or Leymus should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: Elytrigia juncea and/or Leymus arenarius.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of hifting dunes along the shoreline with Ammophila arenaria (white dunes) in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of dune grasses - More than 95% of Ammophila and/or Leymus should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities dominated by Ammophila arenaria and/or Leymus arenarius.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **M***

Conservation Objective: To maintain the favourable conservation condition of Machairs in Clew Bay Complex SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective ‘To maintain the favourable conservation condition’ is used.

Qualifying Interests Feature: Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M***
Conservation Objective: To maintain the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in Clew Bay Complex SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Lutra lutra (Otter) [1355] **R**
Conservation Objective: To restore the favourable conservation condition of Otter in Clew Bay Complex SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Extent of terrestrial habitat - No significant decline.
Extent of marine habitat - No significant decline.
Extent of freshwater (river) habitat - No significant decline.
Extent of freshwater (lake/lagoon) habitat - No significant decline.
Couching sites and holts - No significant decline.
Fish biomass available - No significant decline.
Barriers to connectivity - No significant increase

Qualifying Interests Feature: Vertigo geyeri (Geyer's whorl snail) [1013] **Under review**
Conservation Objective: The status of Geyer's whorl snail as a qualifying Annex II species for Clew Bay Complex SAC is currently under review.

Qualifying Interests Feature: Phoca vitulina (Harbour Seal) [1365] **M**
Conservation Objective: To maintain the favourable conservation condition of Harbour Seal in Clew Bay Complex SAC

Attributes & Targets:
Access to suitable habitat - Species range within the site should not be restricted by artificial barriers to site use.
Breeding behaviour - The breeding sites should be maintained in a natural condition.
Moulting behaviour - The moult haul-out sites should be maintained in a natural condition.
Resting behaviour - The resting haul-out sites should be maintained in a natural condition.
Disturbance - Human activities should occur at levels that do not adversely affect the Harbour Seal population at the site.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.67km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Machairs (* in Ireland) [21A0], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Lutra lutra (Otter) [1355] and Vertigo geyeri (Geyer's whorl snail) [1013].
- Phoca vitulina (Harbour Seal) [1365] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Habitats • Mudflats and sandflats not covered by seawater at low tide [1140] **M** • Coastal lagoons [1150] **M** • Large shallow inlets and bays [1160] **M** • Annual vegetation of drift lines [1210] **M** • Perennial vegetation of stony banks [1220] **M** • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R** • Embryonic shifting dunes [2110] **R** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Machairs (* in Ireland) [21A0] **M*** • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **M***	Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Machairs (* in Ireland) [21A0], Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0], Lutra lutra (Otter) [1355] and Vertigo geyeri (Geyer's whorl snail) [1013] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**

Qualifying Interests (QI): Species • Lutra lutra (Otter) [1355] **R** • Vertigo geyeri (Geyer's whorl snail) [1013] **Under review** • Phoca vitulina (Harbour Seal) [1365] **M**	The risk of disturbance effects on Phoca vitulina (Harbour Seal) [1365] associated with construction and operational activities applies. **Mitigation required**

22. AA Summary Matrix for Slyne Head Peninsula SAC (002074)

Slyne Head Peninsula SAC (002074) is located c.70km west northwest of the site
Slyne Head Peninsula SAC | National Parks & Wildlife Service

Description of the Site: This site comprises the peninsula west of Ballyconneely, Co. Galway. It extends northwards to Errislannan Point to include the shallow waters of Mannin Bay. The peninsula is low-lying and undulating, reaching a maximum height of only 64 m (Doon Hill). The underlying rock is predominantly gneiss, except for schist along the northern shores of Mannin Bay, a granite ridge along the western edge of the peninsula and a conspicuous basalt exposure which forms Doon Hill. The peninsula is fringed with rocky shores and sandy beaches, with some extensive areas of machair and several brackish lakes and lagoons. Inland, the site is a maze of small fields, supporting a mosaic of habitats dominated by grassland and heath, interspersed with numerous lakes and associated swamp, marsh and fen. An important feature of the site is the influence of windblown calcareous sand on these habitats.

According to the Site Synopsis for this SAC, Mannin Bay is an excellent example of a large shallow bay, with a wide range of sediment types. The islets and rocks at the mouth of the bay give some shelter from Atlantic swells. Conditions become more sheltered towards the head of the bay and are extremely sheltered in Mannin Creek. Tidal streams are weak. There are a very high number of sediment communities for such a small area. Mannin Bay is almost unique as a very large proportion of the bay is dominated by a combination of maerl debris and living maerl. Maerl is free living red calcareous algae generally called ‘coral’. The two species that are most abundant in Mannin Bay are Lithothamnion corallioides and Phymatolithon calcareum. In addition Lithophyllum fasclatum and L. dentatum have also been recorded. In shallow water, Eelgrass (Zostera marina) and maerl are found together, an uncommon combination known only from two other locations in Ireland. Mannin Bay has excellent examples of communities characterised by the burrowing brittlestars Amphiura brachiata and A. filiformis. The brittle star Ophiopsila annulosa is present and is an uncommon species. In addition there is an unusual community characterised by the tubeworm Sabella

pavonina in Mannin Creek. The shores on the south side of Mannin Creek are known to have bivalve communities with unusually high species diversity. The beaches of Mannin Bay are unusual as they are composed of maerl debris.

Mannin Bay has good examples of littoral reef communities that are sheltered from wave action and subject to moderate tidal streams. Shoreline communities follow a zonation of lichen zones followed by Pelvetia canaliculata and then barnacles and limpets with Fucus spiralis. The zones are narrow (1-1.5 m), which is typical of sheltered shores. Most of the shore is composed of flat bedrock and boulders characterised by dense Ascophyllum nodosum and Fucus vesiculosus. The dogwhelk Nucella lapillus is common. On the lower shore is a band of Fucus serratus on boulders and bedrock, with sponges, anemones and red algae. In the sublittoral fringe is a mixed flora of kelps (Laminaria saccharina, L. digitata, Saccorhiza polyschides and Himanthalia elongata) and red algae, with areas of sand and gravel with maerl. Sponges, anemones, tunicates and bryozoan crusts are common on the vertical sides and under the boulders. In the shelter of Mannin Creek the uncommon community characterised by Ascophyllum nodosum var. mackii is found on the north side of the creek.

Machair is particularly well developed and forms extensive plains at Mannin Beg and Aillebrack. The machair has a typically herb-rich sward dominated by species such as Red Fescue (Festuca rubra), Wild Thyme (Thymus praecox), Lady's Bedstraw (Galium verum), Daisy (Bellis perennis), clovers (Trifolium spp.) and plantains (Plantago lanceolata and P. coronopus), with damp areas of Creeping Bent (Agrostis stolonifera), Silverweed (Potentilla anserina) and small sedges (Carex spp.). The rare liverwort Petalophyllum ralfsii, a species listed under Annex II of the E.U. Habitats Directive, occurs within damp hollows in the machairs. The population at this site is the largest known in both Ireland and the world.

The machair gives way to bare sand in places with embryonic shifting dunes. These areas are characterised by the presence of Sand Couch (Elymus farctus) and Sand Sedge (Carex arenaria). Some Marram (Ammophila arenaria) dunes occur west of Mannin and towards the tip of the Slyne Head headland. Sandy beaches occur at the seaward side of the machair systems, some of which are 'coral' strands composed of the chalky skeletons of red seaweeds (Lithothamnion sp. and Phymatolithion sp.). Above the beaches typical drift line vegetation and shingle is found with species such as Prickly Saltwort (Salsola kali), Frosted Orache (Atriplex lacinata) and Sea Rocket (Cakile maritima). Parts of the shoreline, particularly east of Mannin machair, are fringed with saltmarsh vegetation developed on peat. Typical species found here include Common Saltmarsh-grass (Puccinellia maritima), Sea Plantain (Plantago maritima), Sea Milkwort (Glaux maritima) and Thrift (Armeria maritima). Saltmarsh dominated by dense stands of Sea Rush (Juncus maritimus) occur at the entrance to Salt Lough.

Brackish lakes and lagoons are a feature of this site. These include Ballyconneelly Lake, Lough Silverhill, Lough Aillebrack South and Lough Athola. These lakes are shallow, with sandy bottoms and shores, and may be directly connected to the sea. They all receive sea spray and during storms may be flooded by the sea. Characteristic species are pondweeds (Potamogeton spp.), stoneworts (Chara spp.) and Tasselweed (Ruppia maritima).

The largest freshwater lake is Lough Anaserd, a typical oligotrophic (nutrient-poor) lake surrounded by heathland. It has a stony shore and numerous rocky islands, some covered with heath vegetation. Aquatic species noted from here include Quillwort (Isoetes lacustris), Bulbous Rush (Juncus bulbosus), Pipewort (Eriocaulon aquaticum), Alternate Water-milfoil (Myriophyllum alterniflorum) and Awlwort (Subularia aquatica). The rare Slender Naiad (Najas flexilis), a species protected under the Flora (Protection) Order, 2015, and listed on Annex II of the E.U. Habitats Directive, is also found here. Truska Lough is another oligotrophic lake and Manninmore Lake is also probably of this type. Other lakes within the site are more nutrient-rich in character, possibly due to a brackish influence (e.g. Dereen Lough), and are fringed with Common Reed (Phragmites australis) and Many-stalked Spike- rush (Eleocharis multicaulis). Also of importance are the associated areas of species- rich marsh (e.g. Ballyconneely and Bunowen marshes) and fen (e.g.Triska), the latter dominated by Black Bog-rush (Schoenus nigricans), Blunt-flowered Rush (Juncus subnodulosus) and sedges (Carex elata, C. lasiocarpa). A scarce orchid, Dactylorhiza traunsteineri, typically found in calcareous marshes and fens, is recorded from this site.

Lough Aillebrack is considered to be a good example of a hard water lake with Chara formations. Species present which are particularly characteristic of hard water lakes include C. contraria, C. desmacantha and C. globularis.

Much of the inland peninsula consists of small fields which contain a complex mosaic of habitats ranging from dry grassland, hay meadow and heath through to wet grassland and marsh. The heath occurs mainly in areas of outcropping rock and is dominated by Western Gorse (Ulex gallii), Bell Heather (Erica cinerea), Cross-leaved Heath (Erica tetralix) and St. Dabeoc's Heath (Daboecia cantabrica). Juniper (Juniperus communis) is also a frequent component of the heath communities here. The dry grassland supports vegetation rich in orchid species, including Early Purple-orchid (Orchis mascula), the two butterfly orchids (Platanthera bifolia and P. chlorantha) and the Red Data Book species Green-winged Orchid (Orchis morio). Two further Red Data Book species, Pyramidal Bugle (Ajuga pyramidalis) and Pale Dog-violet (Viola lactea), occur amongst the heath/grassland mosaic. Pale Dog-violet is legally protected under the Flora (Protection) Order, 2015.

The habitat type 'Molinia meadows' has been recorded in a number of places within this site, often in association with other habitats, such as fen, wet grassland or heath. Typical species include Purple Moor-grass (Molinia caerulea), Common Sedge (Carex nigra), Carnation Sedge (C. panicea), Common Knapweed (Centaurea nigra), Meadow Thistle (Cirsium dissectum), Tormentil (Potentilla erecta), Meadowsweet (Filipendula ulmaria) and Devil's-bit Scabious (Succisa pratensis).

Species-rich lowland hay meadows are also known from this site, supporting species such as Red Fescue, Yorkshire-fog (Holcus lanatus), Crested Dog's-tail (Cynosurus cristatus), Smooth Meadow-grass (Poa pratensis), Wild Carrot (Daucus carota), Common Knapweed and White Clover (Trifolium repens).

Marine waters within the site, including Mannin Bay, support one or more groups of Bottlenose Dolphin (Tursiops truncatus) that are part of a population inhabiting the west and north coasts of Connacht and which numbers at least 177-337 dolphins. This species is listed on Annex II of the EU Habitats Directive. Group sizes of up to 28 individual dolphins have been recorded within the site and sighting records have predominantly occurred in the summer months. Juvenile dolphins have been recorded within observed groups and a range of behaviours have been documented within the site including foraging and social behaviour.

Three Annex I E.U. Birds Directive species are known to breed at the site - Chough (8 pairs in 1992), Sandwich Tern (31 pairs in 1995) and Common Tern (5 pairs in 1995).

The main land use within the site is grazing by cattle, along with some sheep and horses. This is mostly of low to moderate intensity though parts of the machair may be over-grazed. Part of the machair and dune system at Aillebrack has been damaged by the construction of a golf course and this area is excluded from the site. Leisure and tourist related activities may also be damaging parts of the machair system.

This site is of ecological importance for the range and diversity of its semi-natural habitats, many of which are listed on Annex I of the Habitats Directive. The interface between calcareous sand dunes, machair, heath and grassland communities is of particular note. The site is also important for a number of rare and scarce species, especially the liverwort Petalophyllum ralfsii. The site is also of marine conservation importance due to the occurrence of groups of Bottlenose Dolphin, a species listed on Annex II of the Directive.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Coastal lagoons [1150] **R**
- Large shallow inlets and bays [1160] **M**
- Reefs [1170] **M**
- Annual vegetation of drift lines [1210] **M**
- Perennial vegetation of stony banks [1220] **M**
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
- Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
- Embryonic shifting dunes [2110] **R**
- Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
- Machairs (* in Ireland) [21A0] **R**
- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M***

- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M***
- Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **M**
- European dry heaths [4030] **M**
- Juniperus communis formations on heaths or calcareous grasslands [5130] **M**
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
- Alkaline fens [7230] **M**
- Tursiops truncatus (Bottlenose Dolphin) [1349] **M***
- Petalophyllum ralfsii (Petalwort) [1395] **M**
- Najas flexilis (Slender Naiad) [1833] **M**

Qualifying Interests Feature: Coastal lagoons [1150] **M**
Conservation Objective: To maintain the favourable conservation condition of Coastal lagoons in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable, subject to slight natural variation.
Habitat distribution Habitat distribution - No decline, subject to natural processes.
Salinity regime - Median annual salinity and temporal variation within natural ranges.
Hydrological regime - Annual water level fluctuations and minima within natural ranges.
Barrier: connectivity between lagoon and sea - Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.
Water quality: chlorophyll *a* - Annual median chlorophyll *a* within natural ranges and less than 5µg/L.
Water quality: Molybdate Reactive Phosphorus (MRP) - Annual median MRP within natural ranges 0.1mg/L.
Water quality: Dissolved Inorganic Nitrogen (DIN) - Annual median DIN within natural ranges and less than 0.15mg/L.
Depth of macrophyte colonisation - Macrophyte colonisation to maximum depth of lagoons.
Typical plant species - Maintain number and extent of listed lagoonal specialists, subject to natural variation.
Typical animal species - Maintain listed lagoon specialists, subject to natural variation.
Negative indicator species - Negative indicator species absent or under control.

Qualifying Interests Feature: Large shallow inlets and bays [1160] **M**
Conservation Objective: To maintain the favourable conservation condition of Large shallow inlets and bays in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Community extent - Maintain the extent of the Zostera-dominated and Maërl-dominated community complexes, subject to natural processes.
Community structure: Zostera density - Conserve the high quality of the Zostera-dominated community complex, subject to natural processes.
Community structure - Conserve the high quality of the Maërl-dominated community complex, subject to natural processes.
Community distribution - Conserve the following community types in a natural condition: Intertidal sand with Enchytraeidae community complex; Mobile intertidal sand with polychaetes community complex; Subtidal sand with polychaetes and bivalves community complex; Subtidal sand with Kurtiella bidentata community complex; Intertidal reef community complex; Laminariadominated community complex.

Qualifying Interests Feature: Reefs [1170] **M**
Conservation Objective: To maintain the favourable conservation condition of Reefs in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - The permanent habitat area is stable or increasing, subject to natural processes.
Distribution - The distribution of reefs remains stable, subject to natural processes.
Community structure - Conserve the following community types in a natural condition: Intertidal reef community complex; Laminaria-dominated community complex.

Qualifying Interests Feature: Annual vegetation of drift lines [1210] **M**
Conservation Objective: To maintain the favourable conservation condition of Annual vegetation of drift lines in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sea rocket (Cakile

maritima), sea sandwort (Honckenya peploides), prickly saltwort (Salsola kali) and orache (Atriplex spp.).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Perennial vegetation of stony banks [1220] **M**
Conservation Objective: To maintain the favourable conservation condition of Perennial vegetation of stony banks in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: Functionality and sediment supply - Maintain the natural circulation of sediment and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: typical species and sub-communities - Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones.
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover

Qualifying Interests Feature: Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R**
Conservation Objective: To restore the favourable conservation condition of Atlantic salt meadows in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply - Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans – Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in SMP (McCorry & Ryle, 2009).

Vegetation structure: negative indicator species - **Spartina anglica -** Common cordgrass (Spartina anglica) has not been recorded in this SAC and its establishment should be prevented.

Qualifying Interests Feature: Mediterranean salt meadows (Juncetalia maritimi) [1410] **R**
Conservation Objective: To restore the favourable conservation condition of Mediterranean salt meadows in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply - Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: creeks and pans – Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.
Physical structure: flooding regime - Maintain natural tidal regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height - Maintain structural variation within sward.
Vegetation structure: vegetation cover - Maintain more than 90% area outside creeks vegetated.
Vegetation composition: typical species and sub-communities - Maintain range of sub- communities with typical species listed in SMP (McCorry & Ryle, 2009).
Vegetation structure: negative indicator species - **Spartina anglica -** Common cordgrass (Spartina anglica) has not been recorded in this SAC and its establishment should be prevented.

Qualifying Interests Feature: Embryonic shifting dunes [2110] **R**
Conservation Objective: To restore the favourable conservation condition of Embryonic shifting dunes in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Physical structure: sediment supply – Maintain the natural circulation of sediments and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses – More than 95% of sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).

Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R**
Conservation Objective: To restore the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply – Maintain the natural circulation of sediments and organic matter, without any physical obstructions.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation composition: plant health of foredune grasses – More than 95% of sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present).
Vegetation composition: typical species and sub-communities - Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme grass (Leymus arenarius).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.

Qualifying Interests Feature: Machairs (* in Ireland) [21A0] **R**
Conservation Objective: To restore the favourable conservation condition of Machairs in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution - No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply – Maintain the natural circulation of sediments and organic matter, without any physical obstructions.
Physical structure: hydrological and flooding regime - Maintain natural hydrological regime.
Vegetation structure: zonation - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: bare ground - Bare ground should not exceed 10% of Machair habitat, subject to natural processes.
Vegetation structure: sward height - Maintain structural variation within sward.

Vegetation composition: typical species and sub-communities - Maintain range of sub-communities with typical species listed in Delaney et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species (including non-natives) to represent less than 5% cover.
Vegetation composition: bryophytes - Should always be at least an occasional component of the vegetation.

Qualifying Interests Feature: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes including erosion and succession.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - No change to maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition.
Water quality: phytoplankton biomass - Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area and condition - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110.

Qualifying Interests Feature: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M***
Conservation Objective: To maintain the favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea in Slyne Head Peninsula SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **M**
Conservation Objective: To maintain the favourable conservation condition of Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Typical species - Typical species present, in good condition, and demonstrating typical abundances and distribution.
Vegetation composition: characteristic zonation - All characteristic zones should be present, correctly distributed and in good condition.
Vegetation distribution: maximum depth - No change to maximum depth of vegetation, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the vegetation.
Water quality: transparency - Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency.
Water quality: nutrients - Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species.
Water quality: phytoplankton biomass - Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status.
Water quality: phytoplankton composition - Maintain appropriate water quality to support the habitat, including high phytoplankton composition status.
Water quality: attached algal biomass - Maintain trace/ absent attached algal biomass (< 5% cover) and high phytobenthos status.
Water quality: macrophyte status - Maintain high macrophyte status.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes.
Water colour - Maintain appropriate water colour to support the habitat.
Dissolved organic carbon (DOC) - Maintain appropriate organic carbon levels to support the habitat.
Turbidity - Maintain appropriate turbidity to support the habitat.
Fringing habitat: area - Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140.

Qualifying Interests Feature: European dry heaths [4030] **M**
Conservation Objective: To maintain the favourable conservation condition of European dry heaths in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline from current habitat distribution, subject to natural processes.
Ecosystem function: soil nutrient status - Maintain soil nutrient status within natural range.
Vegetation composition: positive indicator species - At least two positive indicator species, as listed in Perrin et al. (2014), with combined cover of at least 50%.
Vegetation composition: bryophyte and non-crustose lichen species - At least three bryophyte or non-crustose lichen species present, excluding Campylopus and Polytrichum moss species.
Vegetation composition: rare/scarce species - No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat.
Vegetation structure: dwarf shrub species - Cover of bog myrtle (Myrica gale), creeping willow (Salix repens) and Western gorse (Ulex gallii) collectively less than 50%.
Vegetation composition: negative indicator weed species - Cover of negative indicator weedy species collectively less than 1%.
Vegetation composition: non-native species - Cover of non-native species less than 1%.
Vegetation composition: native trees and shrubs - Cover of scattered native trees and shrubs less than 20%.
Vegetation composition: bracken - Cover of bracken (Pteridium aquilinum) less than 10%.
Vegetation composition: soft rush - Cover of soft rush (Juncus effusus) less than 10%.
Vegetation structure: senescent ling - Senescent proportion of ling (Calluna vulgaris) cover less than 50%.
Vegetation structure: growth phases of ling - Outside boundaries of sensitive areas, all growth phases of ling (Calluna vulgaris) should occur throughout, with at least 10% of cover in mature phase.
Vegetation structure: signs of browsing - Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%.
Vegetation structure: burning - No signs of burning inside sensitive areas.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%.

Qualifying Interests Feature: Juniperus communis formations on heaths or calcareous grasslands [5130] **M**
Conservation Objective: To maintain the favourable conservation condition of Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Juniper population size - At least 50 plants per formation.
Vegetation composition: typical species - At least 50% of the listed positive indicator species for the relevant vegetation group present.
Vegetation composition: negative indicator species - Negative indicator species, particularly non-native invasive species, absent or under control.
Vegetation structure: cone-bearing plants - At least 10% of plants are bearing cones.
Vegetation structure: seedling recruitment - At least 10% of juniper plants are seedlings.
Vegetation structure: dead juniper - Mean percentage of each juniper plant dead less than 10%.

Qualifying Interests Feature: Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M**
Conservation Objective: To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species (except certain listed species) and bracken (Pteridium aquilinum) not more than 5% cover.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 5cm and 40cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M**
Conservation Objective: To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species.
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5%.
Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 30% of sward between 10 and 80cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M**
Conservation Objective: To maintain the favourable conservation condition of Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Vegetation composition: typical species - At least seven positive indicator species present, including two "high quality" species as listed in O'Neill et al. (2013).
Vegetation composition: negative indicator species - Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%.
Vegetation composition: non-native species - Cover of non-native species not more than 1%.
Vegetation composition: woody species and bracken - Cover of woody species and bracken (Pteridium aquilinum) not more than 5%.

Vegetation structure: broadleaf herb: grass ratio - Broadleaf herb component of vegetation between 40 and 90%.
Vegetation structure: sward height - At least 50% of sward between 10cm and 50cm tall.
Vegetation structure: litter - Litter cover not more than 25%.
Physical structure: bare soil - Not more than 10% bare soil.
Physical structure: disturbance - Area showing signs of serious grazing or other disturbance less than 20m².

Qualifying Interests Feature: Alkaline fens [7230] **M**
Conservation Objective: To maintain the favourable conservation condition of Alkaline fens in Slyne Head Peninsula SAC

Attributes & Targets:
Habitat area - Area stable or increasing, subject to natural processes.
Habitat distribution - No decline, subject to natural processes.
Hydrological regime - Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat.
Peat formation - Active peat formation, where appropriate.
Water quality: nutrients - Appropriate water quality to support the natural structure and functioning of the habitat.
Vegetation composition: typical species - Maintain vegetation cover of typical species including brown mosses and vascular plants.
Vegetation composition: trees and shrubs - Cover of scattered native trees and shrubs less than 10%.
Physical structure: disturbed bare ground - Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%.
Physical structure: drainage - Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%.

Qualifying Interests Feature: Petalophyllum ralfsii (Petalwort) [1395] **M**
Conservation Objective: To maintain the favourable conservation condition of Petalwort in Slyne Head Peninsula SAC

Attributes & Targets:
Distribution of populations - No decline.
Population size - No decline.
Area of suitable habitat - No decline.
Hydrological conditions: soil moisture - Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter.
Vegetation: open structure - Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground.

Qualifying Interests Feature: Tursiops truncatus (Bottlenose Dolphin) [1349] M*
Conservation Objective: To maintain the favourable conservation condition of Bottlenose Dolphin in Slyne Head Peninsula SAC

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Najas flexilis (Slender Naiad) [1833] **M**
Conservation Objective: To maintain the favourable conservation condition of Slender Naiad in Slyne Head Peninsula SAC

Attributes & Targets:
Population extent - No change to the spatial extent of Najas flexilis within the lake, subject to natural processes.
Population depth - No change to the depth range of Najas flexilis, subject to natural processes.
Population viability - No decline in plant fitness, subject to natural processes.
Species distribution - No change to the cover abundance of Najas flexilis, subject to natural processes.
Species distribution - No decline, subject to natural processes.
Habitat extent - No decline, subject to natural processes.
Hydrological regime: water level fluctuations - Maintain appropriate natural hydrological regime necessary to support the habitat for the species.
Lake substratum quality - Maintain appropriate substratum type, extent and chemistry to support the populations of the species.
Water quality - Maintain appropriate water quality to support the populations of the species.
Acidification status - Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the populations of Najas flexilis, subject to natural processes.
Water colour - Maintain appropriate water colour to support the populations of Najas flexilis.
Associated species - Maintain appropriate associated species and vegetation communities to support the populations of Najas flexilis.

Potential for Impact / Mitigation Measures

Potential for Impacts

- The SAC is located c.70km to the northwest of the site within the range of mobile mammal species. There is no source-pathway-receptor chain for adverse effect on Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Machairs (* in

Ireland) [21A0], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], European dry heaths [4030], Juniperus communis formations on heaths or calcareous grasslands [5130], 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], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], Alkaline fens [7230], Petalophyllum ralfsii (Petalwort) [1395] and Najas flexilis (Slender Naiad) [1833].

- Tursiops truncatus (Bottlenose Dolphin) [1349] - Taking a precautionary approach, there is potential for impacts to this QI species via water quality deterioration associated with pre-construction and construction activities, thus potentially affecting fish biomass availability. A potential for disturbance effects associated with pre-construction and construction activities to the Harbour Seal population associated with the SAC also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Habitats • Coastal lagoons [1150] **R** • Large shallow inlets and bays [1160] **M** • Reefs [1170] **M** • Annual vegetation of drift lines [1210] **M** • Perennial vegetation of stony banks [1220] **M** • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] **R** • Mediterranean salt meadows (Juncetalia maritimi) [1410] **R** • Embryonic shifting dunes [2110] **R** • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] **R** • Machairs (* in Ireland) [21A0] **R** • Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] **M**	Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120], Machairs (* in Ireland) [21A0], Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], European dry heaths [4030], Juniperus communis formations on heaths or calcareous grasslands [5130], Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*

• Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] **M*** • Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] **M** • European dry heaths [4030] **M** • Juniperus communis formations on heaths or calcareous grasslands [5130] **M** • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] **M** • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] **M** • Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **M** • Alkaline fens [7230] **M** • Petalophyllum ralfsii (Petalwort) [1395] **M**	important orchid sites) [6210], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410], Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510], Alkaline fens [7230], Petalophyllum ralfsii (Petalwort) [1395] and Najas flexilis (Slender Naiad) [1833] are screened out from likely impacts due to the terrestrial nature of the QI habitat and/or the distance from the subject site to be affected (See Appendix 4 of this report). **No mitigation required**
Qualifying Interests (QI): Species • Tursiops truncatus (Bottlenose Dolphin) [1349] **M*** • Najas flexilis (Slender Naiad) [1833] **M**	The risk of disturbance effects on Tursiops truncatus (Bottlenose Dolphin) [1349] associated with construction and operational activities applies. **Mitigation required**

23. AA Summary Matrix for Inner Galway Bay SPA (004031)

Inner Galway Bay SPA (004031)
Inner Galway Bay SPA | National Parks & Wildlife Service

Description of the Site: Inner Galway Bay SPA is a very large, marine-dominated site situated on the west coast of Ireland. The inner bay is protected from exposure

to Atlantic swells by the Aran Islands and Black Head. Subsidiary bays and inlets (e.g. Poulnaclough, Aughinish and Kinvarra Bays) add texture to the patterns of water movement and sediment deposition, which lends variety to the marine habitats and communities. The terraced Carboniferous (Viséan) limestone platform of the Burren sweeps down to the shore and into the sublittoral. The long shoreline is noted for its diversity, and comprises complex mixtures of bedrock shore, shingle beach, sandy beach and fringing salt marshes. Intertidal sand and mud flats occur around much of the shoreline, with the largest areas being found on the sheltered eastern coast between Oranmore Bay and Kinvarra Bay. A number of small islands and rocky islets in the Bay are included within the site.

According to the Site Synopsis for this SAC, Inner Galway Bay supports an excellent diversity of wintering wetland birds, with divers, grebes, cormorants, dabbling duck, sea duck and waders all well represented. There are internationally important wintering populations of Great Northern Diver (88) and Light-Bellied Brent Goose (676) and nationally important wintering populations of an additional sixteen species i.e. Black-throated Diver (36), Cormorant (266), Grey Heron (102), Wigeon (1,168), Teal (700), Red-breasted Merganser (249), Ringed Plover (335), Golden Plover (2,030), Lapwing (3,969), Dunlin (2,155), Bartailed Godwit (447), Curlew (697), Redshank (505), Turnstone (182), Black-headed Gull (1,941) and Common Gull (1,066) - all figures given are five year mean peaks for the seasons 1995/96 to 1999/2000. Of note is that the populations of Red-breasted Merganser and Ringed Plover represent 6.8% and 2.3% of the respective all-Ireland totals. Other species which occur in notable numbers include Little Grebe (35), Longtailed Duck (21), Scaup (44) and Herring Gull (216). In addition, the following species also use the site: Great Crested Grebe (16), Mallard (200), Common Scoter (87), Oystercatcher (576), Grey Plover (60), Black-tailed Godwit (46), Mute Swan (150) and Great Black-backed Gull (129). The site provides both feeding and roost sites for most of the species. Little Egret, a species which has recently colonised Ireland, also occurs at this site.

The site has several important populations of breeding birds, most notably colonies of Sandwich Tern (81 pairs in 1995) and Common Tern (98 pairs in 1995 on Green Island and 46 pairs in 2001 on Mutton Island). A large Cormorant colony occurs on Deer Island - this had 200 pairs in 1985 and 300 pairs in 1989.

Inner Galway Bay SPA is of high ornithological importance with two wintering species having populations of international importance and a further sixteen wintering species having populations of national importance. The breeding colonies of Sandwich Tern, Common Tern and Cormorant are also of national importance. Also of note is that six of the regularly occurring species are listed on Annex I of the E.U. Birds Directive, i.e. Black-throated Diver, Great Northern Diver, Golden Plover, Bar-tailed Godwit, Sandwich Tern and Common Tern. Inner Galway Bay is a Ramsar Convention site and part of the Inner Galway Bay SPA is a Wildfowl Sanctuary.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Black-throated Diver (Gavia arctica) [A002] **M***
- Great Northern Diver (Gavia immer) [A003] **M**
- Cormorant (Phalacrocorax carbo) [A017] **M**
- Grey Heron (Ardea cinerea) [A028] **M**
- Light-bellied Brent Goose (Branta bernicla hrota) [A046] **M**
- Teal (Anas crecca) [A052] **M**
- Shoveler (Anas clypeata) [A052] **M**
- Red-breasted Merganser (Mergus serrator) [A069] **M**
- Ringed Plover (Charadrius hiaticula) [A137] **M**
- Golden Plover (Pluvialis apricaria) [A140] **M**
- Lapwing (Vanellus vanellus) [A142] **M**
- Dunlin (Calidris alpina) [A149] **M**
- Bar-tailed Godwit (Limosa lapponica) [A157] **M**
- Curlew (Numenius arquata) [A160] **M**
- Redshank (Tringa totanus) [A162] **M**
- Turnstone (Arenaria interpres) [A169] **M**
- Black-headed Gull (Chroicocephalus ridibundus) [A179] **M**
- Common Gull (Larus canus) [A182] **M**
- Common Tern (Sterna hirundo) [A193] **M**
- Wigeon (Mareca penelope) [A050] **M**
- Sandwich Tern (Thalasseus sandvicensis) [A191] **M**
- Wetland and Waterbirds [A999] **M**

Qualifying Interests Feature: Black-throated Diver (Gavia arctica) [A002] **M***
Conservation Objective: To maintain the favourable conservation condition of Black-throated Diver in Inner Galway Bay SPA

***** There are no site-specific conservation objectives listed yet for this QI. As a result, the general conservation objective 'To maintain the favourable conservation condition' is used.

Qualifying Interests Feature: Great Northern Diver (Gavia immer) [A003] **M**
Conservation Objective: To maintain the favourable conservation condition of Great Northern Diver in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by great northern diver, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Cormorant (Phalacrocorax carbo) [A017] **M**
Conservation Objective: To maintain the favourable conservation condition of Cormorant in Inner Galway Bay SPA

Attributes & Targets:
Breeding population abundance: apparently occupied nests (AONs) - No significant decline.
Productivity rate - No significant decline.
Distribution: breeding colonies - No significant decline.
Prey biomass available - No significant decline.
Barriers to connectivity - No significant decline.
Disturbance at breeding site - Human activities should occur at levels that do not adversely affect the breeding cormorant population.
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the numbers or range of areas used by cormorant, other than that occurring from natural patterns of variation

Qualifying Interests Feature: Grey Heron (Ardea cinerea) [A028] **M**
Conservation Objective: To maintain the favourable conservation condition of Grey Heron in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by grey heron, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Light-bellied Brent Goose (Branta bernicla hrota) [A046] **M**
Conservation Objective: To maintain the favourable conservation condition of Light-bellied Brent Goose in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Light-bellied Brent Goose, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Teal (Anas crecca) [A052] **M**
Conservation Objective: To maintain the favourable conservation condition of Teal in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Teal, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Shoveler (Anas clypeata) [A052] **M**
Conservation Objective: To maintain the favourable conservation condition of Shoveler in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Shoveler, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Red-breasted Merganser (Mergus serrator) [A069] **M**
Conservation Objective: To maintain the favourable conservation condition of Red-breasted Merganser in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Red-breasted Merganser, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Ringed Plover (Charadrius hiaticula) [A137] **M**
Conservation Objective: To maintain the favourable conservation condition of Ringed Plover in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Ringed Plover, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Golden Plover (Pluvialis apricaria) [A140] **M**
Conservation Objective: To maintain the favourable conservation condition of Golden Plover in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Golden Plover, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Lapwing (Vanellus vanellus) [A142] **M**
Conservation Objective: To maintain the favourable conservation condition of Lapwing in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Lapwing, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Dunlin (Calidris alpina) [A149] **M**
Conservation Objective: To maintain the favourable conservation condition of Dunlin in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by Dunlin, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Bar-tailed Godwit (Limosa lapponica) [A157] **M**
Conservation Objective: To maintain the favourable conservation condition of Bar-tailed Godwit in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Curlew (Numenius arquata) [A160] **M**
Conservation Objective: To maintain the favourable conservation condition of Curlew in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Redshank (Tringa totanus) [A162] **M**
Conservation Objective: To maintain the favourable conservation condition of Redshank in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.

Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Turnstone (Arenaria interpres) [A169] **M**
Conservation Objective: To maintain the favourable conservation condition of Turnstone in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Black-headed Gull (Chroicocephalus ridibundus) [A179] **M**
Conservation Objective: To maintain the favourable conservation condition of Black-headed Gull in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by Black-headed Gull, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Common Gull (Larus canus) [A182] **M**
Conservation Objective: To maintain the favourable conservation condition of Common Gull in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - There should be no significant decrease in the range, timing or intensity of use of areas by Common Gull, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Common Tern (Sterna hirundo) [A193] **M**
Conservation Objective: To maintain the favourable conservation condition of Common Tern in Inner Galway Bay SPA

Attributes & Targets:
Breeding population abundance: apparently occupied nests (AONs) - No significant decline.
Productivity rate: fledged young per breeding pair - No significant decline.
Distribution: breeding colonies - No significant decline.

Prey biomass available - No significant decline.
Barriers to connectivity - No significant decline.
Disturbance at breeding site - Human activities should occur at levels that do not adversely affect the breeding little tern population.

Qualifying Interests Feature: Wigeon (Mareca penelope) [A050] **M**
Conservation Objective: To maintain the favourable conservation condition of Wigeon in Inner Galway Bay SPA

Attributes & Targets:
Population trend - Long term population trend stable or increasing.
Distribution - No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation.

Qualifying Interests Feature: Sandwich Tern (Thalasseus sandvicensis) [A191] **M**
Conservation Objective: To maintain the favourable conservation condition of Turnstone in Inner Galway Bay SPA

Attributes & Targets:
Breeding population abundance: apparently occupied nests (AONs) - No significant decline.
Productivity rate: fledged young per breeding pair - No significant decline.
Distribution: breeding colonies - No significant decline.
Prey biomass available - No significant decline.
Barriers to connectivity - No significant decline.
Disturbance at breeding site - Human activities should occur at levels that do not adversely affect the breeding sandwich tern population.

Qualifying Interests Feature: Wetland and Waterbirds [A999] **M**
Conservation Objective: To maintain the favourable conservation condition of Wetland and Waterbirds in Inner Galway Bay SPA

Attributes & Targets:
Habitat area - The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 13,267ha, other than that occurring from natural patterns of variation.

Potential for Impact / Mitigation Measures

Potential for Impacts

- Black-throated Diver (Gavia arctica) [A002], Great Northern Diver (Gavia immer) [A003], Cormorant (Phalacrocorax carbo) [A017], Grey Heron (Ardea cinerea) [A028], Light-bellied Brent Goose (Branta bernicla hrota) [A046], Teal (Anas crecca) [A052], Shoveler (Anas clypeata) [A052], Red-

breasted Merganser (Mergus serrator) [A069], Ringed Plover (Charadrius hiaticula) [A137], Golden Plover (Pluvialis apricaria) [A140], Lapwing (Vanellus vanellus) [A142], Dunlin (Calidris alpina) [A149], Bar-tailed Godwit (Limosa lapponica) [A157], Curlew (Numenius arquata) [A160], Redshank (Tringa totanus) [A162], Turnstone (Arenaria interpres) [A169], Black-headed Gull (Chroicocephalus ridibundus) [A179], Common Gull (Larus canus) [A182], Common Tern (Sterna hirundo) [A193], Wigeon (Mareca penelope) [A050], Sandwich Tern (Thalasseus sandvicensis) [A191] and Wetland and Waterbirds [A999] - there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities and a potential for disturbance effects associated with pre-construction, construction and operational activities also identified.

Qualifying Interest (QI) Feature	**Potential for Adverse Effects and Requirement for Mitigation (Summary)**
Qualifying Interests (QI): Species • Black-throated Diver (Gavia arctica) [A002] **M*** • Great Northern Diver (Gavia immer) [A003] **M** • Cormorant (Phalacrocorax carbo) [A017] **M** • Grey Heron (Ardea cinerea) [A028] **M** • Light-bellied Brent Goose (Branta bernicla hrota) [A046] **M** • Teal (Anas crecca) [A052] **M** • Shoveler (Anas clypeata) [A052] **M** • Red-breasted Merganser (Mergus serrator) [A069] **M** • Ringed Plover (Charadrius hiaticula) [A137] **M** • Golden Plover (Pluvialis apricaria) [A140] **M** • Lapwing (Vanellus vanellus) [A142] **M** • Dunlin (Calidris alpina) [A149] **M** • Bar-tailed Godwit (Limosa lapponica) [A157] **M** • Curlew (Numenius arquata) [A160] **M** • Redshank (Tringa totanus) [A162] **M** • Turnstone (Arenaria interpres) [A169] **M**	The risk of disturbance effects on Black-throated Diver (Gavia arctica) [A002], Great Northern Diver (Gavia immer) [A003], Cormorant (Phalacrocorax carbo) [A017], Grey Heron (Ardea cinerea) [A028], Light-bellied Brent Goose (Branta bernicla hrota) [A046], Teal (Anas crecca) [A052], Shoveler (Anas clypeata) [A052], Red-breasted Merganser (Mergus serrator) [A069], Ringed Plover (Charadrius hiaticula) [A137], Golden Plover (Pluvialis apricaria) [A140], Lapwing (Vanellus vanellus) [A142], Dunlin (Calidris alpina) [A149], Bar-tailed Godwit (Limosa lapponica) [A157], Curlew (Numenius arquata) [A160], Redshank (Tringa totanus) [A162], Turnstone (Arenaria interpres) [A169], Black-headed Gull (Chroicocephalus ridibundus) [A179], Common Gull (Larus canus) [A182], Common Tern (Sterna hirundo) [A193], Wigeon (Mareca penelope) [A050], Sandwich Tern (Thalasseus sandvicensis) [A191] and Wetland and Waterbirds [A999] associated with construction and operational activities applies. **<u>Mitigation required</u>**

• Black-headed Gull (Chroicocephalus ridibundus) [A179] **M** • Common Gull (Larus canus) [A182] **M** • Common Tern (Sterna hirundo) [A193] **M** • Wigeon (Mareca penelope) [A050] **M** • Sandwich Tern (Thalasseus sandvicensis) [A191] **M** • Wetland and Waterbirds [A999] **M**	

24. AA Summary Matrix for Lough Corrib SPA (004042)

Lough Corrib SPA (004042) is located 4.5km to the north northwest of the site
Lough Corrib SPA | National Parks & Wildlife Service

Description of the Site: Lough Corrib is the largest lake in the country and is located, for the most part, in County Galway, with a small section in the north extending into County Mayo. The lake can be divided into two parts: a relatively shallow basin in the south, which is underlain by Carboniferous limestone, and a larger, deeper basin to the north, which is underlain by more acidic granite, schists, shales and sandstones. The main inflowing rivers are the Black, Clare, Dooghta, Cregg, Owenriff and the channel from Lough Mask. The main outflowing river is the Corrib, which reaches the sea at Galway City.

According to the Site Synopsis for this SAC, the shallow, lime-rich waters of the southern basin of the lake support one of the most extensive beds of Stoneworts (Charophytes) in Ireland. These Chara beds are a very important source of food for waterfowl. In contrast, the northern basin contains more oligotrophic and acidic waters. Large areas of reedswamp vegetation, dominated by varying mixtures of Common Reed (Phragmites australis) and Common Club-rush (Scirpus lacustris) occur around the margins of the lake. The lake has numerous islands, which range from relatively bare rocky islets to larger islands with grassland or woodland.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greenland White-fronted Goose, Gadwall, Shoveler, Pochard, Tufted Duck, Common Scoter, Hen Harrier, Coot, Golden Plover, Black-Headed Gull, Common Gull, Common Tern and Arctic Tern. 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 Wetlands & Waterbirds.

Lough Corrib is an internationally important site that regularly supports in excess of 20,000 wintering waterbirds including an internationally important population of wintering Pochard (10,107) – except where indicated all figures are five year mean peaks for the period 1995/96 to 1999/2000. The site also supports nationally important populations of wintering Greenland White-fronted Goose (160 - five year mean peak for the period 1994/95 to 1998/99), Gadwall (48), Shoveler (90), Tufted Duck (5,486), Coot (14,426) and Golden Plover (1,727). Other species which occur include Mute Swan (182), Whooper Swan (35), Wigeon (528), Teal (74), Mallard (155), Goldeneye (74), Lapwing (2,424) and Curlew (114).

In winter nationally important numbers of Hen Harrier (8 - four year mean peak count between 2006 and 2009) also utilise the site as a communal roost.

Lough Corrib is also a traditional breeding site for gulls and terns, with various islands being used for nesting each year. There are important colonies of Common Tern (37 pairs in 1995) and Arctic Tern (60 pairs in 1995). The site supports substantial colonies of Black-headed Gull (431 pairs in 2000) and Common Gull (186 pairs in 2000), these representing 3% and 11% of the respective all-Ireland totals. Small numbers of Lesser Black-backed Gull, Great Black-backed Gull and Herring Gull have also been recorded breeding within the site.

The site supports approximately half of the national population of nesting Common Scoter (30 pairs in 1995); Lough Corrib was colonised by this rare, Red Data Book species only as recently as the late 1970s/early1980s.

Lough Corrib SPA is an internationally important site which supports in excess of 20,000 wintering waterbirds, including a population of Pochard that is, itself, of international importance. A further six species of wintering waterfowl have populations of national importance. The site also contains a nationally important communal roost site for Hen Harrier. Lough Corrib is the most important site in the country for breeding Common Scoter. Its populations of breeding gulls and terns are also notable, with nationally important numbers of Black-headed Gull, Common Gull, Common Tern and Arctic Tern occurring. It is of note that several species which regularly occur are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Greenland White-fronted Goose, Hen Harrier, Golden Plover, Common Tern and Arctic Tern. Lough Corrib is a Ramsar Convention site.

Summary of Appropriate Assessment
Conservation Objectives, Attributes & Targets (Summary)

Conservation Objectives
To maintain **(M)** or restore **(R)** favourable conservation condition of:

- Pochard (Aythya ferina) [A059] **R**
- Tufted Duck (Aythya fuligula) [A061] **R**
- Common Scoter (Melanitta nigra) [A065] **M**

- Hen Harrier (Circus cyaneus) [A082] **R**
- Coot (Fulica atra) [A125] **R**
- Golden Plover (Pluvialis apricaria) [A140] **M**
- Black-headed Gull (Chroicocephalus ridibundus) [A179] **R**
- Common Gull (Larus canus) [A182] **R**
- Common Tern (Sterna hirundo) [A193] **R**
- Arctic Tern (Sterna paradisaea) [A194] **R**
- Greenland White-fronted Goose (Anser albifrons flavirostris) [A395] **R**
- Shoveler (Spatula clypeata) [A056] **R**
- Gadwall (Mareca strepera) [A051] **R**
- Wetland and Waterbirds [A999] **M**

Qualifying Interests Feature: Pochard (Aythya ferina) [A059] **R**
Conservation Objective: To restore the favourable conservation condition of Pochard in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term winter population trend is stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.

Qualifying Interests Feature: Tufted Duck (Aythya fuligula) [A061] **R**
Conservation Objective: To restore the favourable conservation condition of Common Tern in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term winter population trend is stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.

Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.

Qualifying Interests Feature: Common Scoter (Melanitta nigra) [A065] **M**
Conservation Objective: To maintain the favourable conservation condition of Common Scoter in Lough Corrib SPA

Attributes & Targets:
Breeding population trend - Long term trend is stable or increasing.
Productivity rate - Sufficient productivity to maintain the population trend as stable or increasing.
Distribution of nesting habitat - No significant loss of distribution in the long term, other than that occurring due to natural patterns of variation.
Extent and condition of nesting habitat - Sufficient area of high quality habitat to support the population target.
Disturbance at breeding site - Disturbance occurs at levels that do not significantly impact the achievement of targets for breeding population trend and spatial distribution of nesting habitat.
Barriers to connectivity and site use - Barriers do not significantly impact the breeding population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat, and available forage biomass to support the population target.

Qualifying Interests Feature: Hen Harrier (Circus cyaneus) [A082] **R**
Conservation Objective: To restore the favourable conservation condition of Hen Harrier in Lough Corrib SPA

Attributes & Targets:
Roost attendance: individual hen harriers - Long term winter population trend within the SPA is stable or increasing.
Forage area spatial distribution, extent and abundance - Sufficient extent of suitable habitats and biomass of available prey items across the site to help support the population.
Roost spatial distribution and extent - Sufficient number of locations, area of suitable roosting habitat to support the population.
Disturbance at the roost site - Human activities occur at levels that do not significantly impact upon wintering hen harrier.

Qualifying Interests Feature: Coot (Fulica atra) [A125] **R**
Conservation Objective: To restore the favourable conservation condition of Coot in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term population trend stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.

Qualifying Interests Feature: Golden Plover (Pluvialis apricaria) [A140] **M**
Conservation Objective: To maintain the favourable conservation condition of Golden Plover in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term population trend stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.
Supporting habitat: area and quality - Sufficient area of utilisable habitat available in ecologically important sites outside the SPA.

Qualifying Interests Feature: Black-headed Gull (Chroicocephalus ridibundus) [A179] **R**
Conservation Objective: To restore the favourable conservation condition of Black-headed Gull in Lough Corrib SPA

Attributes & Targets:
Breeding population size - Long-term population is stable or increasing.
Productivity rate - Sufficient to maintain population.
Distribution: extent of available nesting options within the SPA - Sufficient availability of suitable nesting sites throughout the SPA to maintain the population.
Prey biomass available - Sufficient extent of biomass of available prey items across the site to help support the population.
Disturbance at the breeding site - Disturbance occurs at levels that do not significantly impact on black-headed gull at the breeding site.
Disturbance at areas ecologically connected to the colony - Disturbance occurs at levels that do not significantly impact on black-headed gull at the breeding site.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Common Gull (Larus canus) [A182] **R**
Conservation Objective: To restore the favourable conservation condition of Common Gull in Lough Corrib SPA

Attributes & Targets:
Breeding population size - Long-term population is stable or increasing.
Productivity rate - Sufficient to maintain population.
Distribution: extent of available nesting options within the SPA - Sufficient availability of suitable nesting sites throughout the SPA to maintain the population.
Prey biomass available - Sufficient extent of biomass of available prey items across the site to help support the population.
Disturbance at the breeding site - Disturbance occurs at levels that do not significantly impact on common gull at the breeding site.
Disturbance at areas ecologically connected to the colony - Disturbance occurs at levels that do not significantly impact on breeding common gull.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Common Tern (Sterna hirundo) [A193] **R**
Conservation Objective: To restore the favourable conservation condition of Common Tern in Lough Corrib SPA

Attributes & Targets:
Breeding population size - Long-term population is stable or increasing.
Productivity rate - Sufficient to maintain population.
Distribution: extent of available nesting options within the SPA - Sufficient availability of suitable nesting sites throughout the SPA to maintain the population.
Prey biomass available - Sufficient extent of biomass of available prey items across the site to help support the population.

Disturbance at the breeding site - Disturbance occurs at levels that do not significantly impact on black-headed gull at the breeding site.
Disturbance at areas ecologically connected to the colony - Disturbance occurs at levels that do not significantly impact on breeding common tern.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Arctic Tern (Sterna paradisaea) [A194] **R**
Conservation Objective: To restore the favourable conservation condition of Arctic Tern in Lough Corrib SPA

Attributes & Targets:
Breeding population size - Long-term population is stable or increasing.
Productivity rate - Sufficient to maintain population.
Distribution: extent of available nesting options within the SPA - Sufficient availability of suitable nesting sites throughout the SPA to maintain the population.
Prey biomass available - Sufficient extent of biomass of available prey items across the site to help support the population.
Disturbance at the breeding site - Disturbance occurs at levels that do not significantly impact on black-headed gull at the breeding site.
Disturbance at areas ecologically connected to the colony - Disturbance occurs at levels that do not significantly impact on arctic tern at the breeding site.
Barriers to connectivity - No significant increase.

Qualifying Interests Feature: Greenland White-fronted Goose (Anser albifrons flavirostris) [A395] **R**
Conservation Objective: To restore the favourable conservation condition of Greenland White-fronted Goose in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term winter population trend is stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - No significant impact on the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.
Supporting habitat: area and quality - Sufficient area of utilisable habitat available in ecologically important sites outside the SPA.

Qualifying Interests Feature: Shoveler (Spatula clypeata) [A056] **R**
Conservation Objective: To restore the favourable conservation condition of Shoveler in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term winter population trend is stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.

Qualifying Interests Feature: Gadwall (Mareca strepera) [A051] **R**
Conservation Objective: To restore the favourable conservation condition of Gadwall in Lough Corrib SPA

Attributes & Targets:
Winter population trend - Long term winter population trend is stable or increasing.
Winter spatial distribution - Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target.
Disturbance at wintering site - Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution.
Barriers to connectivity and site use - Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA.
Forage spatial distribution, extent and abundance - Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target.
Roost spatial distribution and extent - Sufficient number of locations, area and availability of suitable roosting habitat to support the population target.

Qualifying Interests Feature: Wetland and Waterbirds [A999] **M**
Conservation Objective: To maintain the favourable conservation condition of Wetland and Waterbirds in Lough Corrib SPA

Attributes & Targets:
Wetland habitat area - No significant loss to wetland habitat within the SPA, other than that occurring from natural patterns of variation.
Wetland habitat quality and functioning - No significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation.

Potential for Impact / Mitigation Measures

Potential for Impacts

- Common Scoter (Melanitta nigra) [A065], Black-headed Gull (Chroicocephalus ridibundus) [A179], Common Gull (Larus canus) [A182], Common Tern (Sterna hirundo) [A193], Arctic Tern (Sterna paradisaea) [A194] - there is potential for impacts to these QI species via water quality deterioration associated with pre-construction and construction activities and a potential for disturbance effects associated with pre-construction, construction and operational activities also identified.

Qualifying Interest (QI) Feature	Potential for Adverse Effects and Requirement for Mitigation (Summary)
Qualifying Interests (QI): Species • Pochard (Aythya ferina) [A059] **R** • Tufted Duck (Aythya fuligula) [A061] **R** • Common Scoter (Melanitta nigra) [A065] **M** • Hen Harrier (Circus cyaneus) [A082] **R** • Coot (Fulica atra) [A125] **R** • Golden Plover (Pluvialis apricaria) [A140] **M** • Black-headed Gull (Chroicocephalus ridibundus) [A179] **R** • Common Gull (Larus canus) [A182] **R** • Common Tern (Sterna hirundo) [A193] **R** • Arctic Tern (Sterna paradisaea) [A194] **R** • Greenland White-fronted Goose (Anser albifrons flavirostris) [A395] **R**	The risk of disturbance effects on Common Scoter (Melanitta nigra) [A065], Black-headed Gull (Chroicocephalus ridibundus) [A179], Common Gull (Larus canus) [A182], Common Tern (Sterna hirundo) [A193], Arctic Tern (Sterna paradisaea) [A194] associated with pre-construction, construction and operational activities applies. **<u>Mitigation required</u>**

• Shoveler (Spatula clypeata) [A056] **R** • Gadwall (Mareca strepera) [A051] **R** • Wetland and Waterbirds [A999] **M**	

Potential impact mechanisms from the project

It has been established that the GHE will cause:

1. Direct and permanent loss of 5.93ha of Reef habitat and Mudflat and Sand Flats not covered by seawater at low tide habitat of the Galway Bay Complex Special Area of Conservation (SAC), and
2. Loss of 0.35ha of Perennial vegetation of stony banks due to the sheltering effect of the harbour extension. These losses will have a significant adverse effect on the integrity of the SAC.

As outlined in Section 9 of the Planning Report, a Compensatory Measures Plan has been approved by the Minister for Housing, Local Government and Heritage for these losses.

Pre-construction Impacts

A. Impact on Marine Communities – Permanent and irreversible loss of intertidal habitats due to bore holes.
B. Impact on Marine Communities from Noise and Vibration – Disturbance due to topographical survey, bore holes and bathymetric survey.

Construction Impacts

C. Impact on Marine Communities – Permanent and irreversible loss of intertidal habitats. Permanent loss of stony bank vegetation due to recolonisation. Deterioration of habitat quality due to water and air quality degradation. Imapct on life cycle of fish and mammals due to dust.

D. Impact on Marine Communities from Noise and Vibration – Disturbance due to dredging, bore holes, blasting and impulsive pile driving, construction of quay walls, lagoons and breakwater.
E. Impacts from Sediment Re-suspension – Potential impacts on marine biota from sediment re-suspension due to capital dredging include smothering biological seabed communities affecting respiration in fish and marine mammals.

Other sources of impact identified in the NIS Addendum 2024 include:

F. 2D seismic survey – Disturbance to marine mammals.
G. Extended number of boreholes and core holes – Loss of habitat for intertidal and subtidal species and a loss of foraging habitat for bird species.
H. Spread of invasive species.

Operational Impacts

I. Impact on SCI Bird Species – A potential for indirect effect via disturbance and displacement risk to SCI bird species as a result of increased shipping.

It has been determined that additional impacts may accrue to QIs within the Natura 2000 network as a result of pre-construction works, namely from 2D seismic survey, and the extended number of boreholes and core holes. Similarly, an additional impact may accrue to QIs within the Natura 2000 network during the construction phase as a result of the spread of an invasive species - Japanese knotweed (*Reynoutria japonica*).

Where an ecological pathway exists, these direct impacts could negatively alter the quality of the existing environment, negatively affecting qualifying interest species and habitats that are sensitive to these impacts.

<u>Mitigation Measures</u>

The applicant has proposed a series of mitigation to avoid adverse effects on the Galway Bay Complex SAC (000268), Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (000190), Inishbofin and Inishshark SAC (000278), Lough Corrib SAC

(000297), Slyne Head Islands (000328), Duvillaun Islands SAC (000495), Inishkea Islands SAC (000507), Maumturk Mountains SAC (002008), Connemara Bog Complex SAC (002034), Kilkieran Bay and Islands SAC (002111), Lower River Shannon SAC (002165), Blasket Islands SAC (002172), West Connacht Coast SAC (002998), Donegal Bay (Murvagh) SAC (000133), St. John's Point SAC (000191), Inishmore Island SAC (000213), Killala Bay/ Moy Estuary SAC (000458), Ballysadare Bay SAC (000622), Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625), Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627), Clew Bay SAC (001482), Slyne Head Peninsula SAC (002074), Inner Galway Bay SPA (004031) and Lough Corrib SPA (004042).

The proposed mitigation measures outlined in Natura Impact Statement and Natura Impact Statement Addenda/ Errata Documents (2014, 2015, & 2019) are:

1) Use of geotextiles in the construction of the lagoons to minimise the escape of sedimentation.
2) Avoid works from April-July in line with sensitive months for salmon.
3) Construction stage monitoring programme for suspended solids and dissolved oxygen.
4) Restrict dredging of sediments within 800m of the mouth of Lough Atalia during ebb tides to avoid the possibility of suspended sediments entering Lough Atalia.
5) Implementation of Emergency Spill Contingency Plan.
6) Marine Mammal Watch Plan including marine observers prior to blasting.
7) Monitoring of birds and common seal, prior to, during and after construction.

In addition to the mitigation measures outlined in the original NIS and NIS Addenda/ Errata Documents (2014, 2015, & 2019), the applicant proposes additional mitigation measures in the NIS Addendum 2024. A summary assessment of these additional measures is provided in the table below.

Summary of assessment of mitigation measures			
Mitigation Measures	**Assessment**	**Implementation**	**Monitoring**
Test airgun shots prior to 2D seismic survey	This will encourage any nearby mammals to avoid this area	Contractor	Marine Mammal Observer (MMO)
Marine Mammal Observer (MMO)	Reduce potential of adverse effects to marine mammals during the works	Applicant/ Contractor	Appointment of MMO during period of construction/ Ongoing by Contractor
Updated Exclusion Zones - Impact piling: 1900m Blasting: 1500m Dredging: 1700m	Reduce potential of adverse effects to marine mammals (harbour porpoise)	Contractor	Marine Mammal Observer (MMO)
Invasive Species Management Plan	Reduce potential of adverse effects to the integrity of Galway Bay Complex SAC	Applicant/ Contractor	Appointment of ecologist and specialist contractor/ ongoing by environmental manager

As well as the possible negative impacts on marine mammals that are in the vicinity of the proposed development site during pre-construction through noise disturbance caused by the air gun that precedes 2D seismic testing, I also draw the Commission's attention to possible impacts from dredging, piling and blasting on the mobile mammals associated with the Natura 2000 sites.

Marine Mammal Species

I note that data from the National Biodiversity Data Centre and NPWS were used for a desk study of marine mammals sighted in Galway Bay Complex SAC. This

includes sightings of harbour seal, grey seal, and harbour porpoise in the last 5 years. Further to this, a marine mammal survey was carried out in 2023 which documented a total of 109 sightings, including harbour seal, grey seal, bottlenose dolphin, and otter.

Notably, only the harbour seal and otter are designated as QIs of the Galway Bay Complex SAC. The grey seal is designated as a QI of Duvillaun Islands SAC, Inishkea Islands SAC, Slyne Head Islands SAC and Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC. The harbour porpoise is designated as a QI of West Connacht Coast SAC, Kilkieran Bay and Islands SAC, Inishmore Island SAC, and Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC. Although not sighted in the area in the 2023 surveys, the bottlenose dolphin is designated as a QI of Duvillaun Islands SAC, West Connacht Coast SAC, Slyne Head Islands SAC, St. John's Point SAC and Slyne Head Peninsula SAC. The otter is a designated QI on seven of the Natura 2000 sites brought forward to Stage II, but only three of these sites (Galway Bay Complex SAC, Lough Corrib SAC and Connemara Bog Complex) are within their foraging range.

Additional mitigation measures proposed for the above-mentioned sites in the form of the provision of a Marine Mammal Observer (MMO) during all proposed site investigation works (also refer to sections 7.6.11 and 7.6.12 in my Planning Report), a full treatment and management plan for the invasive species Japanese Knotweed, updated exclusion buffers for temporary threshold shift and updated exclusion buffers in relation to Harbour porpoise throughout the construction phase.

This is particularly relevant, but not exclusively, for the Harbour Porpoise as this species has only been added as a QI to a number of the European sites listed above in the past year. Although the NIS Addendum 2024 is only assessing a limited number of impacts, such as seismic surveys, boreholes/ core holes and the spread of invasive species, I note that the NIS Addendum 2024 also describes mitigation proposed to address noise impacts on marine mammals from impact piling, blasting and dredging.[1] Furthermore, the proposed mitigation has been updated to take account of new information on harbour porpoise sensitivity, so that the exclusion zones used in the mitigation have been increased for this species. The MMO will be

[1] P.73, Section 6.6.1, Additional Proposed Mitigation, NIS Addendum (2024)

engaged during the 2D seismic surveys and an exclusion zone of 1,000m is required for all seismic surveys per current guidance.[2]

I am also satisfied that this provides adequate information and confirmation that these proposed mitigation measures will ensure no adverse impacts are likely to mobile mammal species associated with all of the Natura 2000 sites identified in my Screening Report and carried forward to this AA.

Fish Species

I note that the conservation objectives for Sea Lamprey *Petromyzon marinu and* Salmon *Salmo salar* under the Lough Corrib SAC is 'To restore the favourable conservation condition' and 'To maintain the favourable conservation condition', respectively. These two species are not considered sensitive to sound pressure. Lamprey hearing is based on particle motion, as is salmons and in narrow band frequencies. I am satisfied that, with the stated mitigation measures in place, that the proposed GHE will not prevent or delay the timing of the restoration of Sea Lamprey or maintaining the Salmon populations.

Bird Species

I note that the original Appropriate Assessment carried out by the Commission in relation to Inner Galway Bay SPA (4031) and Lough Corrib SPA (004042) concluded that while some adverse impacts are likely, a significant adverse effect on the integrity of these Natura sites will not arise in view of the site's conservation objectives once mitigation measures have been taken into account. Further to this, the surveys and analysis in the updated bird report[3] confirm that there were no significant changes in the bird populations utilising the study area since the time of the original surveys. In his marine ecology report attached as Appendix 1 to this Planning Report, Mr. Bastreri notes that the area continues to support low numbers of waterbirds, with no species of national importance present.

I also note the conclusion of the Bird Report in relation to disturbance due to watercraft activity and, hence, possible operational activity from the proposed GHE:

[2] Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (Department of Arts, Heritage and the Gaeltacht, January 2014).
[3] EIS Addendum 2024, Appendix 7.5, Galway Harbour Extension: Waterbird Survey, Winter 2022/23.

"The most frequently recorded disturbance impacts to waterbirds were from pedestrian and dog activity on the shoreline and in the intertidal. Only 20% of observations of powered watercraft activity, and none of the observations of non-powered watercraft activity, resulted in observed disturbance impact to waterbirds. There were no observations of watercraft activity causing disturbance impacts to Great Northern Divers."[4]

Therefore, I am satisfied no adverse impacts will accrue to the QI's of these Natura 2000 sites.

Galway Bay Complex SAC

In their submission, the DoHLGH (Nature Conservation) noted the conclusion that the evaluation of marine and coastal habitats has not changed under the NIS Addendum 2024 and that there will be "no additional significant impact to Galway Bay SAC" and the Department agrees that the conclusion reached by the applicant is supported by the available information. This is also supported by independent expert opinion in Mr Bastreri's report (see Appendix 1) where he states that the comparison of new survey results with previous data confirm that earlier conclusions remain valid and, as a result, the earlier conclusion that the proposed development with appropriate mitigation measures will not have significant adverse effects on the environment remains valid.

Overall, I am satisfied that the proposed mitigation measures are adequate for the purposes of the Galway Bay Complex SAC, and for the cases in which mitigation is not possible, such as the loss of fucoid-dominated reef habitat, intertidal mud and sandflat habitat and stony bank habitats which are QIs of the Galway Bay Complex SAC, appropriate compensatory measures have been developed and accepted (please refer to Section 9 of this Planning Report).

In-Combination Effects

There is potential for air and water emissions from the project alone and in combination with other existing, permitted and proposed plans and projects to

[4] P.35, EIS Addendum 2024, Appendix 7.5, Galway Harbour Extension: Waterbird Survey, Winter 2022/23.

undermine the conservation objectives of the Natura 2000 network. The applicant's NIS Addendum 2024 identifies plans/ projects as presenting a risk of acting in-combination with the Proposed Development, which include *inter alia*:

- National University of Ireland, Galway (22180): Permission granted for the construction of a new water sport facility with the provision of 2 no. floating pontoons on the bank of the River Corrib and a pedestrian and cyclist greenway along the River Corrib.
- Seagullpoint Limited (2047 and ABP-310568-21): Permission granted for a 10-year permission for the construction of mixed-use regeneration project including 376 no. apartments, retail units, cafe/restaurant/bar units, Hotel, office use, childcare facility, car parking and other services. Note: Split decision to refuse residential towers Pin 4 and 5 of Block 9.
- Dept. of Agriculture, Food & The Marine (23218): Permission granted for a deepwater quay which will provide 200 metres of outside berthing frontage at Rossaveel Harbour (subject to a Judicial Review – substitute consent application pending).
- Galway City Council (ABP-314597-22): Permission granted for proposed BusConnects Galway (Cross City Link-University Road to Dublin Road) Scheme.
- Galway County Council (ABP-318220-23): Application for N6 Galway City Ring Road consisting of approximately 18km of road infrastructure from new junction with the R336 at the western side of Bearna to tie-in to the existing N6 to the east of Galway City at Coolagh, Briarhill.
- Fuinneamh Sceirde Teoranta (ABP-317409-23): Application for the proposed development of an offshore wind farm and associated infrastructure for Sceirde Rocks.
- A number of foreshore applications, aquaculture sites, and fisheries orders.
- Wastewater treatment plant on Mutton Island.
- Both the Galway and Gort Lowlands flood relief schemes (both at feasibility and design stage).

- Galway County Development Plan 2022-2028
- Galway City Development Plan 2023-2029
- 4th National Biodiversity Action Plan 2023-2027
- Compensatory Measures Plan

I also note two other plans/ projects as presenting a risk of acting in-combination with the Proposed Development, namely:

- Land Development Agency (P.A. Ref. No. 2560296): Application for a proposed mixed-use development of 356 no. residential apartments, a creche, 2 no. café/restaurants, and 1 no. retail unit.
- Galway City Council (ABP-321776-25): Permission granted for BusConnects Galway: Dublin Road Development.

The permitted and proposed developments are all either a distance from the application site or within the urban area of Galway City and not connected to the application site. The GCDP has an objective for the development of a Masterplan for the Inner Harbour Regeneration Site, which will be subjected to the appropriate assessment process if it comes to fruition. The GHE will not affect the flood relief scheme for the city or require flood protection and is sufficiently removed from Kinvarra Bay to affect or be affected by the Gort Lowlands scheme.

The proposed GHE will compromise some of the conservation objectives of QIs in the Galway Bay Complex SAC, but a Compensatory Plan has been agreed for this. The Compensatory Measures Plan with Accompanying Measures and Additional Environmental Benefits will result in an overall significant positive impact on the environment of Galway Bay Complex SAC and the coherence of the Natura 2000 network. This conclusion is not altered by the further information submitted with the EIS Addendum 2024, the NIS Addendum 2024 and associated surveys and documents.

Integrity Test

Following the appropriate assessment and the consideration of mitigation measures, I am able to ascertain with confidence that the project would not adversely affect the

integrity of the Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (000190), Inishbofin and Inishshark SAC (000278), Lough Corrib SAC (000297), Slyne Head Islands SAC(000328), Duvillaun Islands (000495), Inishkea Islands SAC (000507), Maumturk Mountains SAC (002008), Connemara Bog Complex SAC (002034), Kilkieran Bay and Islands SAC (002111), Lower River Shannon SAC (002165), Blasket Islands SAC (002172), West Connacht Coast SAC (002998), Donegal Bay (Murvagh) SAC (000133), St. John's Point SAC (000191), Inishmore Island SAC (000213), Killala Bay/ Moy Estuary SAC (000458), Ballysadare Bay SAC (000622), Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625), Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627), Clew Bay SAC (001482), Slyne Head Peninsula SAC (002074), Inner Galway Bay SPA (004031) and Lough Corrib SPA (004042) in view of the Conservation Objectives of these sites.

Residual Effects

Taking account of the mitigation measures outlined above, I consider that there is no potential for residual adverse effects on the Qualifying Interests of the screened-in European Sites, except for the Galway Bay Complex SAC, as a result of the proposed GHE.

In relation to the Galway Bay Complex SAC, it has been accepted under the Article 6(4) IROPI process (see Section 9 of my Planning Report) that the Compensatory Measures Plan, Accompanying Measures and Additional Environmental Benefits (July 2022) will provide a significant positive effect on the SAC and the overall coherence of the Natura 2000 network.

This conclusion has been based on a complete assessment of all implications of the project alone and in combination with other plans and projects.

Appropriate Assessment Conclusion

I consider the Applicant has provided a detailed description of the likely potential effects of the proposed development at all phases of development, which focuses on the impacts on Qualifying Features of European Sites which were screened in for all phases of development.

I am satisfied that the proposed development individually or in combination with other plans or projects would not adversely affect the integrity of any European sites in light of their conservation objectives (subject to the implementation of mitigation measures outlined above).

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the proposed development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the following European Sites:

- Slieve Tooey/ Tormore Island/ Loughros Beg Bay SAC (000190)
- Inishbofin and Inishshark SAC (000278)
- Lough Corrib SAC (000297)
- Slyne Head Islands SAC(000328)
- Duvillaun Islands (000495)
- Inishkea Islands SAC (000507)
- Maumturk Mountains SAC (002008)
- Connemara Bog Complex SAC (002034)
- Kilkieran Bay and Islands SAC (002111)
- Lower River Shannon SAC (002165)
- Blasket Islands SAC (002172)
- West Connacht Coast SAC (002998)
- Donegal Bay (Murvagh) SAC (000133)
- St. John's Point SAC (000191)
- Inishmore Island SAC (000213)
- Killala Bay/ Moy Estuary SAC (000458)
- Ballysadare Bay SAC (000622)
- Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (000625)
- Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627)
- Clew Bay SAC (001482)
- Slyne Head Peninsula SAC (002074)
- Inner Galway Bay SPA (004031)
- Lough Corrib SPA (004042)