



in association with Ralph Sheppard, Gaia Associates

PILOT ECOLOGICAL STUDY OF TWO DONEGAL ISLANDS: INISHFREE UPPER AND INISHMEANE

OCTOBER 2010



An Action of the County Donegal Heritage Plan

DEDICATION

**We dedicate this report to the islanders of Inishfree Upper and Inishmeane
for their kindness and hospitality**

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CHAPTER 1: INTRODUCTION

The inhabited islands off the County Donegal coast support a population of at least 775 people. These islands possess a rich natural, historical and archaeological heritage. Much of the research focus has been on the built or cultural heritage of these islands. For example: Comharchumann Forbartha agus Fostaíochta have begun a project to map all of the drinking water wells of Aranmore while Forsythe (2006) has examined some of the archaeology sites of the west Donegal islands. Although the natural heritage and biodiversity on inhabited islands is acknowledged through the designation of protected sites under the EU Habitats Directive (92/43/EEC) and EU Birds Directive (79/409/EEC) as Candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs) for Birds respectively (the so-called Natura 2000 designations), there is a lack of baseline information on the rich biological diversity of flora, fauna and wildlife habitats that exists on islands inside (or outside) these designated areas.

While census figures for County Donegal's off-shore islands exhibit only slight increases in permanent populations, it belies a greater increase in seasonal residents. As a result of this population change, the biodiversity of off-shore islands is changing and important aspects of flora, fauna and wildlife habitats are disappearing. In order to guide sustainable economic development of these islands, more detailed information is therefore required on the biodiversity of these islands.

Donegal County Development Plan (CDP) 2006-2012 (Chapter 8) seeks to protect the natural heritage of the County:

'to protect, and where possible enhance, plant and animal species and their habitat, which have been identified under the EU Habitats Directive, EU Birds Directive, the Wildlife Act and the Flora Protection Order'.

Section 8.2 of the CDP deals directly with Natural Heritage. Policy BNH1 seeks:

'(a) to maintain, and where possible enhance, the conservation value of all pNHAs, cSACs, and SPAs, as identified by the minister for the DoEHLG, as well as many other sites that may be proposed for designation during the lifetime of this Plan and (b) ensure development proposals do not destroy or damage any sites of international or national importance, designated for their wildlife/habitat significance, including pNHAs, cSACs and SPAs.'

Under Policy TC3(2)(4) of the Donegal CDP (2006-2012), it is the policy of Donegal County Council to “*prepare an Island Strategy setting out in detail specific policies and programmes for the development of the islands*”. Furthermore, one of the main product development areas identified in the County Development Plan is “*Island Development*” (Section 9.3., Donegal County Development Plan).

The County Donegal Heritage Plan (2007-2011) lists a series of 79 “*Actions*” which would achieve one or more of five main objectives:

Objective 1: To raise awareness and promote appreciation of County Donegal’s natural, built and cultural heritage.

Objective 2: To collect, publish and disseminate data and information about County Donegal’s heritage.

Objective 3: To promote best practice in the management and care of our natural, built and cultural heritage.

Objective 4: To develop interest and knowledge in County Donegal’s heritage through access, education and training.

Objective 5: To inform public policy and advocate the strategic and integrated management of heritage.

Action 2.26 states: “*Pilot an ecological study of one of the small inhabited islands off the Donegal coast*”. This has been expanded to cover two islands in this study and, while it is focused on our natural heritage (rather than the built or cultural) and officially comes under Objective 2, it is hoped that it will contribute, to some degree, to all of the five objectives outlined above.

The proposed study also addresses Action 7 in the Draft County Donegal Biodiversity Action Plan which is to “*Undertake a pilot ecological study of an inhabited island to provide strategic advice on sustainable human settlements and maintenance of biodiversity. Consider the need for a Habitat Action Plan for marine islands based on the findings*”. The proposed action is an opportunity to raise awareness of, gather data on, and promote ‘best practice’ in relation to the conservation of the flora, fauna and wildlife habitats on County Donegal’s off-shore islands. The two very different in character Donegal islands chosen for this study were Inis Fraoigh (Inisfree Upper), and Inis Meáin (Inishmeane). Islanders have worked the land and inshore waters for

centuries and it is their traditional farming practices that have determined the extent to which biodiversity has been maintained on the islands and in inshore waters. However, in recent decades these practices have declined or been eliminated to the long-term detriment of biodiversity in some instances. It is the restoration of these traditional land-use practices within an overall framework of sustainable economic development that offer the best hope of preserving the unique natural heritage of these islands for future generations to come.

CHAPTER 2: BACKGROUND

AIMS OF THE STUDY

Irish islands on account of their relative isolation and sparse populations support a diverse complement of semi-natural habitats and rare or uncommon species. It is the diversity of landforms and habitats as influenced by subtle differences in climate, soil and land-use history that has made the west Donegal islands so special in terms of their heritage and scenic beauty.

There has been a long tradition of studying such land areas stretching back to the beginning of the twentieth century. The first Clare Island Survey of 1909-1911 was the most ambitious natural history project ever undertaken in Ireland and the first major biological survey of a specific area carried out in the world. Other comprehensive island studies have included Sherkin Island, County Cork Rocky Shore Monitoring programme which has been running from Sherkin Island Marine Station since 1975, with 69 sites surveyed annually on Sherkin Island and the islands of Roaringwater Bay, and in Dunmanus Bay. In 1995, the programme was extended along the coastline from Bantry Bay to Cork Harbour, increasing the number of sites to 144. In addition, Akeroyd (1996) has comprehensively researched the wild plants of Sherkin, Cape Clear and adjacent islands of west Cork. This pilot study, although not as comprehensive as the Clare Island or Sherkin surveys due to limited resources, is the most comprehensive study of a Donegal island ever undertaken by a team of ecologists.

The main aims of the study were to:

- Identify and list the fauna and flora on Inishfree Upper and Inishmeane;
- Describe and map the wildlife habitats present using the habitat classification system of Fossitt (2000) and identify historical island ecology trends;
- Consult with key stakeholders in the collection of data/information and to raise awareness of biodiversity; and
- Make recommendations regarding the management and conservation of flora, fauna and wildlife habitats on the two islands while considering human settlement requirements.

METHODOLOGY

A habitat survey of Inishfree Upper (including neighbouring Inishinny) and Inishmeane was carried out on selected dates in November 2008 and June-September 2009. The habitats were classified using the habitat classification system of Fossitt (2000). The main terrestrial habitats of Inishmeane and Inishfree Upper were mapped, using ArcView 9.2 GIS software, onto colour aerial photographs of the island (see **Appendices 1a-1b**). Rocky Sea Cliffs (CS1) and Shingle and Gravel Banks (CB1) and Littoral Rock (LR), and Littoral Sediment (LS) were not mapped. In some parts of the islands, especially on Inishfree Upper, the habitats change over very short distances and therefore these areas were mapped as mosaics.

It was decided to focus on recording well-known relatively easily identifiable plant and animal groups that would best indicate the quality of the habitats on the islands. The groups chosen were flowering plants, moths and birds. In addition, marine biologist Julia Nunn aided by botanist Graham Day provided additional data on marine intertidal species. Casual observations of bryophytes (mosses and liverworts), terrestrial insects and terrestrial and freshwater molluscs were also recorded in the field or collected for identification at a later date. Collected specimens were submitted to various experts for identification. The experts were: Ian Killeen and Evelyn Moorkens (terrestrial and freshwater molluscs), and Roy Anderson (terrestrial insects). Five hundred and forty-three species were recorded on or around Inishfree Upper. In contrast, 346 species were recorded on or around Inishmeane at least partly reflecting the higher habitat diversity on the former island.

OVERVIEW OF IRISH ISLANDS

By the mid-nineteenth century, about two hundred Irish islands were inhabited permanently. Nowadays, the number has dropped to some fifteen. The Famine, but mainly migration to the richer farms of east Donegal, or further afield to pick potatoes ('tattie hoking') in Scotland, led to the abandoning of the west Donegal islands. The population of Inishfree Upper in 1911 was 206 after which there was a steady decline (Central Statistics Office, Dublin). Inishfree Upper was largely abandoned in 1975 and Inishmeane in the mid-1960s. Currently, Inishfree hosts only one permanent dweller. Both islands are mainly occupied seasonally for holiday purposes. Some holiday cottages are owned by the original islanders or their descendents while others have been sold to newcomers. Help for island communities from the government was limited or absent

until the 1980s. Prior to this, decisions were made by government to evacuate some islands. However, things began to be turned around when island co-ops were started. Comharchumann Oilean Árann Mhór Teo (Arranmore Island Co-operative Limited) was registered in 1978. This cooperative focused its human and financial investments for the development of the island and the welfare of the community in conjunction with the public authorities. However, despite the setting up of these co-ops, a common feeling among the islanders was that a common voice was needed to lobby the national authorities. Therefore, in 1984, Comhdháil Oileáin na hÉireann (Irish Islands Federation) was created. Initially, the Irish Islands Federation's main goal was to raise issues of concern to the islanders to the relevant public authorities. This lobbying eventually paid off in that the public authorities acknowledged that the islands deserved special actions to preserve and enhance a unique cultural and linguistic heritage (Loncle, 2006).

The main objectives of Comhdháil are:

- Social, economic and cultural development aimed at fostering the full development of the individual in the island community;
- Representation for member island communities at local, national and European levels; &
- Providing a forum for island representatives.

At the beginning, the Federation also presented a more specific objective: *'Our ultimate demand is that the Government establish one Authority with total responsibility for islands and recognise Comhdháil na nOileáin as a consultative body to that Authority'* (Royle, 1986).

Eventually the lobbying of the Federation finally led to success. In 1987, a governmental committee was created to deal with the islands. Following that, the islands were integrated within the Department of Arts, Heritage, Gaeltacht and the Islands. Since 2002, a special division within the Department of Community, Rural and Gaeltacht Affairs, has looked after the affairs of the islands. The uniqueness of islands was officially recognised in a governmental report (Government of Ireland, 1996) that established a strategy for their development:

'To support island communities in their economic, social and cultural development, to preserve and enhance their unique cultural and linguistic heritage and to enable the islanders to secure access to adequate levels of public service so as to facilitate full and active participation in the overall economic and social life of the nation'.

LOCATION

Inishfree Upper (Inis Fraoigh translated as Heather Island) is situated five kilometres west of Dungloe in the Parish of Templecrone. This island is sandwiched between Rutland Island to the north and Termon to the south. Its maximum altitude is c.14 metres (45 feet). The land area of the island surveyed during this study covered c.140 hectares. A pilot, small islands ferry service to the island from Burtonport commenced in the summer of 2009. The island forms part of Rutland Island and Sound candidate Special Area of Conservation (002283) (cSAC) under the EU Habitats Directive, as far as the Mean High Water Mark (MHWM) only. This cSAC has been designated to protect several habitats of European Conservation Importance notably fixed dunes, lagoons, marram dunes, embryonic shifting dunes, dune slacks, drift lines, reefs and large shallow inlets and bays. Species protected under Annex 1 of the EU Birds Directive 79/409/EEC notably the Corncrake *Crex crex* and Chough *Pyrhhorcorax pyrrhorcorax* has also been reported from the island but, in the case of the former species, not in recent years.

The low-lying island of Inishmeane is situated one kilometre off the west Donegal coast within Gweedore Bay, in the Parish of Tullaghobegley. This island is sandwiched between Inishsirrerr to the north and Gola Island to the southwest. Its maximum altitude is c.33 metres (100 feet). The land area of the island covers c.52 hectares. The island is accessible by boat from Bunbeg. The island forms part of a Special Protection Area for Birds (004131) under the EU Birds Directive 79/409/EEC. The site, together with neighbouring Inishsirrerr, is also classified as an Important Bird Area (IBA) by BirdLife International as a result of its important population of wintering Barnacle Goose *Branta leucopsis*, a species listed for protection under Annex 1 of the EU Birds Directive. In the winter of 1995 total numbers reached 300-400 (Birdlife International: www.birdlife.org/datazone/species/index.html). The Important Bird Areas project identifies the key sites for bird conservation on objective scientific criteria and makes a strong case for their strict protection to sustain their important bird populations.

Both islands are an occasional breeding site for up to five tern species: Common Tern *Sterna hirundo*, Arctic Tern *Sterna paradisaea*, Roseate Tern *Sterna dougallii*, Sandwich tern *Sterna sandvicensis* and Little Tern *Sterna albifrons*, all also listed for protection under the EU Birds Directive.

GEOLOGY

The underlying bedrock of the two islands is granite. The granite has a well-marked jointed structure which gives the rock a roughly horizontal bedded appearance. This can be seen on the southern and western shores of Inishmeane when viewed from the sea (**Photo 1**).



Photo 1: Granite Bedrock on Shores of Inishmeane

The bedrock of the western two-thirds of the island of Inishfree Upper is Late Caledonian igneous intrusive grano-diorite rock, and the eastern third felsite and microgranite. In addition, glacial erratics (**Photo 2**) deposited during the last ice age occur on Inishfree Upper (such as at grid reference B 71482 12286).



Photo 2: Glacial Erratic on Inishfree Upper

SETTLEMENT

Forsythe (2006) explored the archaeology sites of some of the west Donegal islands including Inishmeane in his Ph.D. thesis 'Improving insularity: an archaeology of the islands off the north coast of Ireland in the later historic period, 1700-1847'. The earliest depictions of settlement in the islands are contained on early charts. MacKenzie's 1759 view of the northwest coast shows Inishmeane with no houses. However, on the southern tip of Inishmeane, there is a place called Calluragh Point. This placename indicates a burial ground (Lacey et al., 1983). In addition, evidence of past settlement on Inishmeane is seen from the variety of stone structures on the island not only the houses (**Photos 3 & 4**) but also what may have been a granite kelp store made from dry-stone blocks with cement in places which would appear to have been used as a modern animal shelter.



Photo 3: View from the Sea of Settlement on Inishmeane



Photo 4: Typical Houses on Inishmeane

In addition, rectangular seaweed drying platforms above the beaches comprising large granite blocks also occur. An admiralty chart dating from 1854 and surveyed by Captain G.A. Bedford shows the settlement pattern on Inishmeane at that time (**Photo 5**) (Source: National Library of Ireland, Dublin).

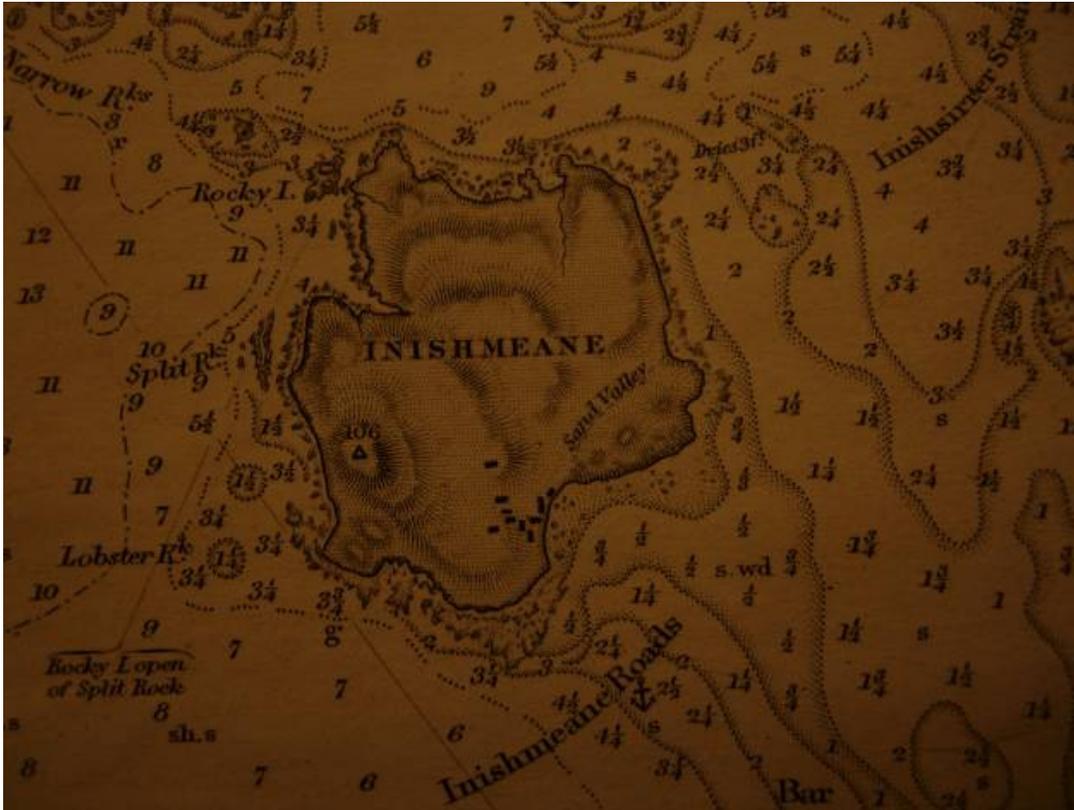


Photo 5: Admiralty Chart Dating from 1854 Showing Inishmeane

Ireland's Valuation Office conducted its first survey of property ownership in Ireland from 1848 to 1864. This survey became known as Griffith's Valuation after Richard Griffith who was the director of the office at that time. It states that Inishmeane was controlled by the landlord Lord George A. Hill with an area of 117 statute acres, 0 roods and 6 perches comprising 1 house, 19 offices and land (Annesley Malley, pers. comm.). The spread of settlement on this island can be seen by comparing the 6" colour (1834-1842) O.S. map of Inishmeane and the 25" black and white (1887-1913) O.S. map showing that, by the latter date, the number of houses on the island had substantially increased.

MacKenzie's 1759 view shows buildings on the north and east coast of Inishfree. The map evidence points to a strong continuity of settlement from the mid-eighteenth century to the present. There are no archaeological monuments recorded on the island and very few in the Rosses or Gweedore as a whole. However, a feature of historical importance to the islanders is the Mass Rock (**Photo 6**) on the eastern coast of the island where mass was held in secret during Penal Times.



Photo 6: Mass Rock on Inishfree Upper

The period from 1691 to 1761 was the age of the Penal Laws against Catholics in Ireland when a determined effort was made to consolidate the Protestant ascendancy.

In the eighteenth century, the islands of northwest Donegal were used mainly by the inhabitants of the mainland as summer grazing (booleying) grounds for cattle. It seems that as the populations in hilly areas of west Donegal increased in the late eighteenth and nineteenth centuries, the traditional booleying places often became permanent homes (Gerard Skehan, pers. comm.). In Inishfree, although most settlement is in the northeast quarter of this island, houses are not as clustered as on neighbouring Aranmore. Instead, they are scattered along the shoreline. This may be due not only to the advantages of being close to the shore for fishing and seaweed but the fact that settlement was restricted by the low, boggy ground over much of the island until drainage in the early nineteenth century was achieved by digging deep ditches over one-metre deep by two-metres wide. An admiralty chart dating from 1854 and surveyed by Captain G.A. Bedford shows the settlement pattern on Inishfree Upper at that time (**Photo 7**) (Source: National Library of Ireland, Dublin).

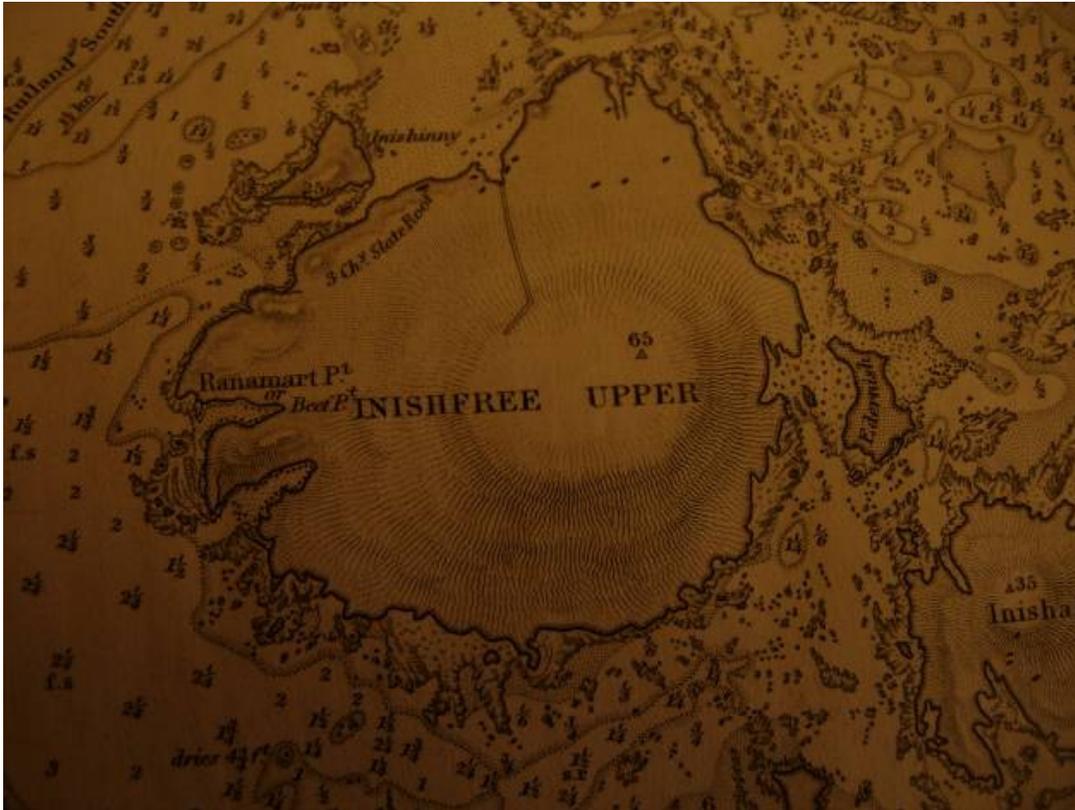


Photo 7: Admiralty Chart Dating from 1854 Showing Inishfree Upper

In addition, a 6" O.S. map in the Conyngham Estate Papers housed in the National Library, Dublin annotated with the year 1913 shows the island subdivided into numbered plots probably held by individual tenants (**Photo 8**).



Photo 8: 6" OS Map Showing Tenant Plots on Inishfree Upper in 1913

The old network of now revegetating tracks and field systems is still visible on Inishfree Upper and Inishmeane (**Photo 9**) delimited by old dry-stone walls now collapsed or hidden under vegetation and earthen banks.



Photo 9: Old Trackway on Inishmeane

New fields were laid out in the form of strip boundaries (walls) which fan out from a central point on the island. These were originally up to 563 metres long and have been further subdivided into smaller parcels. By 1851, although the fan pattern had been laid out, only a small part of the southern coast close to settlement had been successfully reclaimed. It is likely that the nearby tenants undertook this task.

In 1876, the Conynghams owned lands in County Donegal amounting to 122,300 acres. The earliest records relating to the Conyngham estates date from Brigadier Henry Conyngham who flourished in the late seventeenth century. Inishfree, along with most of the Rosses, became the property of the Marquis of Conyngham in the late seventeenth century. It was then settled by the Alcorn and Grant families some time in the seventeenth or eighteenth centuries. Griffith's Valuation states that Inishfree Upper encompassed an area of 341 acres, 0 roods and 18 perches. Settlement comprised 30 houses (**Photos 10 & 11**) with land, 1 office and land, 7 land only and a schoolhouse (**Photos 12 & 13**) with farm size varying from 1 acre to 65.5 acres (Annesley Malley, pers. comm.).



Photo 10: Typical Vernacular Houses on Inishfree Upper



Photo 11: Vernacular Longhouse on Inishfree Upper



Photo 12: The Old Schoolhouse on Inishfree Upper



Photo 13: Interior of Abandoned Schoolhouse on Inishfree Upper

The only two-storey house on the island is claimed to have been built by the forebears of President Ulysses Simpson Grant, 18th President of the United States (1860-1877). Judging from architectural and cartographic evidence, it dates to at least the early nineteenth century (Gerard Skehan, pers. comm.).

As already mentioned, the islands were depopulated during the twentieth century due to the harsh living conditions, emigration and lack of government support. Duffy (2004) gives a detailed account of the history of settlement on Inishfree in her book 'Inishfree: A Tribute to a Donegal Island and its People'.

After the original islanders left in the mid-1970s, a commune was set up on the island for a number of years. Currently, there is only one full-time resident on Inishfree Upper. Although still largely depopulated at least during the harsher winter months, houses on both islands are being restored as holiday homes by the original islanders and their descendents, or by newcomers. Overall there is renewed interest in the cultural and natural heritage of these islands. On Inishfree, arts have flourished with some arts exhibition and workshops organised, and an Inishfree Writers' Group created. The link between islanders remains strong with regular reunions for the islanders and their descendents organised on Inishfree Upper. There have been recent developments on both islands – for example, the installation of an electrical and freshwater supply to Inishfree Upper, and resurfacing of tracks and improved landing facilities on Inishmeane.

However without careful planning within an overall framework of sustainable economic development, land-use changes, whether initiated by islanders or by newcomers not in tune with traditional practices, will potentially have an adverse effect on the unique heritage of the islands.

AGRICULTURE AND FISHING

The earliest detailed description of social conditions in west Donegal is an account of life in the Rosses written in 1753 by an anonymous writer and published by JC Walker in his historical memoirs of the Irish Bards in 1786 showing that the livelihood of the peasants was derived from farming and that fishing was established in the area.

Agriculture has always been harsh on these islands on account of the rocky terrain. Much of the islands are comprised of rock exposed at the surface with limited areas suitable for cultivation, on account of the thin, poor-quality topsoil. Areas suitable for cultivation are very sparse and, even then, the soil has required continual enrichment to maintain its fertility (typically using seaweed, shell sand and animal dung).

The climate of the west Donegal islands is maritime, with mild temperatures and moderate to high precipitation. West Donegal and its fringing islands have a cloudy, cool and excessively moist climate. Data for the Rosses is very incomplete. There was a weather station at Bunbeg but this only operated between 1956 and 1959. Glenties is the nearest weather station 30 miles south of Bunbeg – records dating back to 1923. Average annual rainfall total is 1,525 mm with a minimum in spring and early summer. Rain days vary between 225 and 250 in a year. However, strong winds and heavy seas in autumn, winter and spring restrict any sea-related activity - notably marine transport and fishing.

Historically, a diverse range of crops were grown on the islands (and in the Rosses as a whole) including potatoes, hay, corn and barley, with flax also grown elsewhere in the Rosses on the Conyngham Estate. Potato ridges or ‘lazy beds’ are clearly visible in places on both islands. Inishfree Upper has traditionally been grazed with sheep and cattle. Some of this livestock was, and still is, brought over from the mainland and neighbouring islands (such as Aranmore). Hens, geese, donkeys and pigs would also have been kept on the islands.

On the 6” colour (1834-1842) O.S. map of Inishmeane, a corn kiln is sited due south of the cluster of houses and school on the southeastern corner of the island. This corn kiln, however, was not marked on the 25” black and white (1887-1913) O.S. map. A diverse range of vegetables would have been grown near to the houses. On Inishfree Upper, vegetables are still grown around the house of the only permanent resident. Recently two beehives have been installed on the island using the threatened native Dark European Bee *Apis mellifera mellifera* (Hans Schleweck, pers.

comm.). This will play an important role in the study, conservation, restoration and improvement of this species with the potential of establishing a new cottage industry on the island. In addition, Comhdháil Oileáin na hÉireann has launched a horticulture programme implemented with success on some islands. An organic communal allotment scheme could be considered on Inishfree Upper but, at the present time, would not be justified on Inishmeane. Produce could be for personal consumption when the island is more populated during the summer months or sold on the mainland through farmers markets as branded Inishfree Upper products.

Islanders would have lived on a diet dominated by milk, potatoes and fish with tea, bread and butter. Turf was cut on both islands in summer and stacked to dry out for winter use. This practice has largely ceased on both islands allowing the bog to recover to some extent. Hay was traditionally cut later on in summer in west Donegal. Corn was usually ripe for cutting in September with harvesting of turnips and potatoes the last tasks of autumn. During the winter, the corn was threshed. Drains were also cleared and ditches and fences mended in winter – weather permitting.

In the eighteenth and early nineteenth centuries, the islands were used mainly by inhabitants of the mainland as seasonal grazing grounds for cattle but, as large permanent island populations grew up, the islanders increasingly developed a dependence on fishing. In the nineteenth century, the Sprat *Sprattus sprattus* were one of the chief foods of the coastal communities during the late summer months. The flesh of fish was salted for the winter. Inishmeane formerly relied a lot on fishing (Aalen & Brody, 1969). Fishing as a whole faces a number of difficulties in modern times (and west Donegal is no exception), namely an ageing fleet, infrastructural weaknesses, poor access to markets, regulatory constraints and issues associated with pricing and the sustainability of stocks. Overfishing, or unsustainable fishing practices such as bottom trawling, causes a lot of damage to marine life. Overall fishing is more seasonal. The main species fished were traditionally the Herring *Clupea harengus*, Salmon *Salmo salar* and later the Lobster *Homarus gammarus* (Nautilus Consultants, 2007). All fishing activity in Gweedore Bay is currently small-scale, inshore potting activity, targeting Lobster with a bycatch of the Brown or Edible Crab *Cancer pagurus* (Bord Iascaigh Mhara, pers. comm.).

The people in the Rosses pursued seals and porpoises for their flesh and used the sealskins for their shoes and for their currachs, although the latter were usually covered with horse or cowhide. The coastline also provided edible seaweeds, shellfish, seabirds and their eggs which, are now, no longer consumed.

DESIGNATED AREAS

Forty-seven cSACs and 24 SPAs have been designated in County Donegal owing to the threatened habitats and rare species of high conservation value that they support. Inishmeane has been incorporated into the Inishsirrerr and Inishmeane SPA (004131). It is also part of the Gweedore Bay and Islands cSAC under the EU Habitats Directive (site code 001141). This latter site is an extensive coastal zone situated between Bloody Foreland in the north and Burtonport in the south and near the towns of Derrybeg, Bunbeg and Annagry. It includes a large stretch of coastline and coastal habitats along with many islands including Inishsirrerr, Inishmeane, Gola, Umfin, Inishfree Lower, Cruit and Owey, and areas of marine water between the islands and the coast. The site is of high ecological value for the occurrence of a wide range of coastal habitats including areas of well-developed machair and sand dunes. Associated with the dune systems are dune slacks with their own unique plant communities. These occur in both small, seasonally-flooded depressions interspersed between areas of high fixed dune and more extensive flat areas. It contains thirteen habitats that are listed; four with priority status on Annex I of the EU Habitats Directive and, as such, is of considerable conservation significance. Several of the bird species that use the site are listed on Annex I of the EU Birds Directive, such as Barnacle Goose, Chough, Great Northern Diver *Gavia immer*, Storm Petrel *Hydrobates pelagicus* and the Tern species, and, as such, are of particular significance.

The site is notable for the presence of a number of rare plants species including the aquatic Slender Naiad *Najas flexilis* and the liverwort Petalwort *Petalophyllum ralfsii*, both of which are listed on Annex II of the EU Habitats Directive. Other scarce mosses recorded from the site include *Distichium inclinatum* and *Rhodobryum roseum*. Also found on the site are Small-white Orchid *Pseudorchis albida*, a protected species (Flora Protection Order, 1987) and the threatened Red Data Book species, Hoary Whitlowgrass *Draba incana* and the nationally scarce small fern, Moonwort *Botrychium lunaria*.

Only the marine part of Inishfree Upper has been incorporated into the Rutland Island and Sound cSAC (site code: 002283). Rutland Island and Sound cSAC contains important examples of eight habitats listed on Annex 1 of the EU Habitats Directive namely fixed dunes, lagoons, marram dunes, embryonic shifting dunes, dune slacks, drift lines, reefs and shallow inlets and bays. It also includes beds of the valuable Eelgrass. The site supports a number of rare marine species including the hydroid *Laomedea angulata*.

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as cSACs and SPAs. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing,
- The ecological factors that are necessary for its long-term maintenance exist are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable. The favourable conservation status of a species is achieved when:
 - Population data on the species concerned indicate that it is maintaining itself, and
 - The natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and
 - There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

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Conservation management plans are currently being produced for all these sites to ensure that the maintenance of the favourable conservation status of these sites is addressed. However, to date, these are not at an advanced stage for the aforementioned sites. Any conservation recommendations for the islands need to be in line with those in any future conservation management plans. Sites are usually zoned in these plans to ensure that the highest conservation areas are protected. Natural Zones are areas of high conservation value, which require no or little management intervention. Areas of Active Management are areas of high conservation value where high management input is needed to maintain, rehabilitate and restore them to a more desirable state. Intensively Used Areas/Infrastructure Zones (such as buildings and artificial surfaces) form an integral part of a nature conservation site. Impact Zones are areas outside the site where activities may have an impact on the site. Operations within designated areas that may require consent from National Parks & Wildlife Service (NPWS) include:

- Land drainage including blocking, altering or deepening watercourses or wetlands,
- Burning of rooted vegetation,
- Causing erosion by any means (such as driving vehicles and riding horses),
- Commercial or private recreational activities liable to cause significant disturbance to birds,

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- Construction or alteration of fences, tracks, paths, roads, embankments, car parks or access routes,
- Deliberate scaring of birds,
- Dumping, burning, disposal or storing of any materials including wastes,
- Grazing of livestock above a recommended density and period (as defined in NPWS Farm Plans or prescriptions under REPS [Rural Environment Protection Scheme] or other Government approved agricultural and/or environment schemes),
- Introduction (or re-introduction) into the wild of plants or animals species not currently found in the area,
- Vegetation clearance or habitat destruction except for routine maintenance,
- Planting of trees,
- Reclamation, in-filling, ploughing or otherwise disturbing the substrate, removal of soil, mud, sand, gravel, rock or minerals,
- Removing or altering walls or ruined buildings that may be roost sites for bats,
- Broad-scale application of any pesticide or herbicide.

ISLAND FARMING AND WILDLIFE

The natural heritage present on these islands cannot be divorced from its cultural history. There is documentary and anecdotal evidence of a long island tradition of working the land on these islands in ways that have ensured the survival of a wide range of semi-natural habitats and their associated flora and fauna, including many rare and uncommon species. Both islands, on account of their relative isolation and depopulated status, supported a diverse range of marine and terrestrial habitats of high conservation value.

Owing to depopulation, however, traditional land management practices have declined. As a result, the favourable conservation status of some of these habitats (such as the semi-natural grasslands) is under threat. An example of adverse changes is undergrazing of the semi-natural grasslands on both islands resulting in a rank grassland sward. Recent changes to the Common Agricultural Policy, which break the link between subsidy and production, mean that the future of livestock grazing is at risk in large areas of the country because farmers no longer have to keep unprofitable enterprises running in order to receive subsidy. In this regard, Inishmeane was sheep and cattle-grazed not less than 15 years ago (Charlie O'Donnell, pers. comm.).

Commonage Framework Plans have been produced to establish appropriate grazing regimes in order to address the serious issue of overgrazing of western pastures. Farmers must conform to the Commonage Framework Plan with regard to outwintering and stock levels. A Commonage Framework Plan for Inishmeane (dated February 2003) concluded that no destocking was necessary in that the pastures on these islands are undergrazed. Livestock grazing plays a key role in maintaining species-rich habitats by controlling more aggressive species which would otherwise dominate these areas and by preventing scrub encroachment (English Nature, 2005) that would lead to the shading out of the unique grassland flora. Fauna such as breeding waders may also suffer in that if a sward becomes too rank, breeding success is curtailed.

CHAPTER 3: PLANTS AND VEGETATION

HABITATS ON INISHFREE UPPER

Stone Walls and Other Stonework (BL1)

Although these are often not stockproof as they have not been maintained due to depopulation, they are characteristic of a particular area, both in the way they have been established and in the patterns they form in the landscape. They must be sensitively managed and removal not permitted. They also provide a valuable habitat for plants, animals and birds. Where soil has accumulated, they are often colonized with heath and grassland species with shade tolerant ferns (such as Hard-fern *Blechnum spicant* and Broad Buckler-fern *Dryopteris dilatata*) within crevices between the stones.

Rocky Sea Cliffs (CS1) and Shingle and Gravel Banks (CB1)

The following species were recorded on more accessible coastal cliffs and rocks: Wild Thyme *Thymus polytrichus* (**Photo 14**), Thrift *Armeria maritima*, Ribwort Plantain *Plantago lanceolata*, Buck's-horn Plantain *P. coronopus*, Red Fescue *Festuca rubra*, Common Scurvygrass *Cochlearia officinalis*, the lichens *Ramalina siliquosa*, *Verrucaria maura* and *Caloplaca marina* and the moss *Schistidium maritimum*, the latter only found on coastal rocks beyond the spray zone.



Photo 14: Wild Thyme *Thymus polytrichus*

Shingle and Gravel Banks were colonised with patches of *Festuca rubra* and occasional *Plantago lanecolata*, *P. coronopus*, Curled Dock *Rumex crispus*, Sand Sedge *Carex arenaria*, Sea Sandwort *Honckenia peploides*, White Clover *Trifolium repens*, *Armeria maritima*, Sea Mayweed *Tripleurospermum maritimum*, *Cochlearia officinalis*, and the lichen *Ramalina siliquosa*. There were also small discrete areas of unvegetated shingle around the coast (such as at grid reference B 70842 11993).

Reed and Large Sedge Swamps (FSI)

Common Reed *Phragmites australis* occurs in small patches on the island notably at grid reference B71311 12303 intermixed with wet grassland and dense bracken and at grid reference B 71654 12350. It also occurs in small stands on the rocky shore (such as at grid reference B 70968 11740).

Scrub (WSI)

There is little in the way of tree cover on Inishfree Upper except for a line of aspen (**Photo 15**)



Photo 15: Aspen *Populus tremula*

along the edge of an inland cliff (grid reference B 71428 12298) grading into stands of Eared Willow *Salix aurita*. Willow scrub occurs at B 71799 11782 intermixed with Bramble *Rubus fruticosus* agg. but scrub cover was generally sparse on the island as a whole often grading into other habitats such as wet grassland. There are also small areas of Gorse *Ulex europaeus* scrub on lens of dry mineral soil within the bog/heath complex (such as at grid reference B 71969 11984). In addition, on the western side of the island there was an extensive area of willow planted around one of the inhabited buildings. The planting of additional areas of willow and

scrub species in general would provide much needed additional nesting habitat and shelter for resident and migrant bird species.

Woody species making up the scrub around some of the many old ruined buildings were Wild Privet *Ligustrum vulgare*, Larch *Larix* sp., Hazel *Corylus avellana*, Escallonia *Escallonia* sp., Blackthorn *Prunus spinosa*, Hawthorn *Crataegus monogyna*, and Elder *Sambucus nigra*; the latter hosting the fungus *Auricularia auricula-judae*. Other herbs around the ruined houses included non-native garden species such as Montbretia *Crocasmia x crocosmiflora*, and New Zealand Flax *Phormium tenax*. Ivy often occurs on the ruined buildings.

There was evidence for a more extensive tree cover on Inishfree Upper in the past. Firstly, the presence of numerous stumps of Scots Pine *Pinus sylvestris* under deep peat and secondly, the presence of typical woodland herbs (such as Wood-sorrel *Oxalis acetosella* and Primrose *Primula vulgaris*) in rock crevices which protects them from livestock grazing.

Cutover Bog (PB4)

This habitat type (**Photo 16**) often forms a complex mosaic with wet heath and wet grassland.



Photo 16: Cutover Blanket Bog

Old peat banks and the occasional peat hagg (indicating the original level of the peat) colonised with Heather *Calluna vulgaris* and Bell Heather *Erica cinerea* occur throughout this habitat. The peat surface is largely well vegetated indicating that this is old cutover bog. However it lacks the diversity of vegetation structure and characteristic undisturbed pool/hummock complexes of intact blanket bog as well as characteristic bog mosses indicative of intact bog (e.g. *Sphagnum magellanicum* and *Sphagnum imbricatum*).

Remnant bog species included patchy cover of Cross-leaved Heath *Erica tetralix*, building and carpet stage *Calluna vulgaris*, Bog Pimpernel *Anagallis tenella*, Black Bog-rush *Schoenus nigricans*, Many-stalked Spike-rush *Eleocharis multicaulis*, Round-leaved Sundew *Drosera rotundifolia*, Star Sedge *Carex echinata*, Tormentil *Potentilla erecta*, Purple Moor-grass *Molinia caerulea*, Bog Asphodel *Narthecium ossifragum*, Devil's-bit Scabious *Succisa pratensis*, Deergrass *Trichophorum cespitosum*, Common Cottongrass *Eriophorum angustifolium* and

Carnation Sedge *Carex panicea*, the liverwort *Odontoschisma sphagni*, and mosses including *Hylocomnium splendens*, *Dicranum scoparium*, *Racomitrum lanuginosum*, *Polytrichum commune*, *Campylopus atrovirens*, and *C. introflexus*. There were also large treacherous wet carpets and low hummocks of the bog mosses *Sphagnum palustre*, *Sphagnum papillosum* and *Sphagnum capillifolium* (**Photo 17**) in places.



Photo 17: *Sphagnum capillifolium* hummock

The lichen *Cladonia portentosa* was also locally abundant with *C. uncialis* less common. Marsh Pennywort *Hydrocotyle vulgaris* and *Anagallis tenella*, *Carex echinata*, *Schoenus nigricans* and Bog-myrtle *Myrica gale* occurred in more flushed sloping areas in conjunction with *Molinia caerulea*. The aeration of the peat due to drainage is indicated by the presence of Soft-rush *Juncus effusus* stands in places. A *Sphagnum squarrosum*-dominated intermixed with carpets of *Anagallis tenella*, Jointed Rush *Juncus articulatus*, *Juncus effusus*, and Yorkshire-fog *Holcus lanatus*. A flush occurs at Grid ref. B 71267 11588.

The cutover bog contained old bog pools in places. The largest found on the island was at Grid ref. B 71668 12020 measuring c. 20m x 20m and colonised with extensive stands of *Eriophorum*

angustifolium together with carpets of the bog moss *Sphagnum cuspidatum*. Other bog pools contained abundant Bog Pondweed *Potamogeton polygonifolius*. The Sphagnum cover (the main species being *Sphagnum cuspidatum*, *S. capillifolium* and *S. papillosum*) on the old cutover bog was quite extensive in places where high watertables are being maintained (e.g. where water collects at the base of gentle slopes or at the foot of peat banks). In wetter areas (e.g. along drains), Royal Fern *Osmunda regalis* is very common (**Photo 18**).



Photo 18: Royal Fern *Osmunda regalis*

This fern is very frequent in suitable habitat in western Ireland but much rarer in the eastern half of the country.

An interesting feature on the old cutover bog was the presence of stumps of bog pine (**Photo 19**) (e.g. at Grid ref. B 71449 11939 and B 71463 11938) indicating that the island was once covered in forest before the climate became wetter and allowed blanket bog to form and dominate. Including the root spread, these stumps were up to 1m across.



Photo 19: Bog Pine on Inishfree Upper

Exposed Siliceous Rock (ERI)

This occurs throughout the island both on the coast and inland. These rocky outcrops (**Photo 20**)



Photo 20: Exposed Siliceous Rock

support a diverse range of higher plants, ferns, bryophytes and crustose and foliose lichens namely Biting Stonecrop *Sedum acre*, Sheep's Sorrel *Rumex acetosella*, Red Fescue *Festuca rubra*, Heath Bedstraw *Galium saxatile*, *Thymus praecox*, Cat's-ear *Hypochoeris radicata*, Mouse-ear-hawkweed *Pilosella officinarum* (**Photo 21**), Bell Heather *Erica cinerea*, Polypody *Polypodium vulgare*, *Blechnum spicant*, *Dryopteris dilatata*, *Ctenidium molluscum*, *Dicranum scoparium*, *Hylocomnium splendens*, *Thamnobryum alopecurum*, *Frullania tamarisci*, *Cladonia ciliata*, *Peltigera lactucifolia*, and in more coastal areas *Ramalina siliquosa*.



Photo 21: Mouse-ear-hawkweed *Pilosella officinarum*

Drainage Ditches (FW4)

These occur sporadically throughout the island. They support such species as *Potamogeton polygonifolius*, Water-starwort *Callitriche* agg., Common Duckweed *Lemna minor*, Plicate Sweet-grass *Glyceria notata*, Water Mint *Mentha aquatica*, Bristle Club-rush *Isolepis setacea*, Marsh Horsetail *Equisetum palustre*, Bulbous Rush *Juncus bulbosus*, False Fox-sedge *Carex otrubae*, Brookweed *Samolus valerandi*, Purple-loosestrife *Lythrum salicaria*, Common Marsh-bedstraw *Galium palustre*, Meadowsweet *Filipendula ulmaria*, Yellow Iris *Iris pseudacorus*, Fool's-water-cress *Apium nodiflorum*, Water-cress *Rorippa nasturtium-aquaticum*, Creeping Buttercup *Ranunculus repens* and Lesser Spearwort *Ranunculus flammula*. The most species-rich drain was what is known locally as the March Ditch.

Improved Agricultural Grassland (Improved) (GA1)

This grassland type consisting of a species-poor Perennial Rye-grass *Lolium perenne*-Crested Dog's-tail *Cynosuros cristatus* sward of relatively low conservation value occurs around some of the old ruined buildings.

Wet Grassland (GA4)

Wet grassland (**Photo 22**) covers large areas of the eastern part of the island as a stand-alone habitat. It also occurs in smaller stands as a complex mosaic with dry siliceous heath, wet heath, dense bracken and bramble stands, old revegetated cutover bog and exposed siliceous rock. It commonly occurred on the wet ground between rocky outcrops (**Photo 23**).



Photo 22: Species-rich Wet Grassland



Photo 23: Wet Grassland in Hollow Between Rocky Outcrops

This often-rank grassland type varied in species richness and sward height depending on grazing history, degree of improvement and soil wetness. The ranker stands with colonising bramble have probably not been grazed in some time. The wet grassland generally occurred on peaty substrates.

The species composition of this grassland type comprised dense stands of the rushes *Juncus effusus*, Sharp-flowered Rush *Juncus acutiflorus*, and *J. articulatus*, together with a diverse range of other grasses and herbs namely Sweet Vernal-grass *Anthoxanthum odoratum*, *Holcus lanatus*, Bush Vetch *Vicia sepium*, Cock's-foot *Dactylis glomerata*, Velvet Bent *Agrostis canina*, Angelica *Angelica sylvestris*, *Trifolium repens*, Red Clover *Trifolium pratense*, Yellow-rattle *Rhinanthus minor*, Marsh Ragwort *Senecio aquaticus*, Common Spotted-orchid *Dactylorhiza fuchsii*, Self-heal *Prunella vulgaris*, Silverweed *Potentilla anserina*, *Hydrocotyle vulgaris*, *Anagallis tenella*, Cuckooflower *Cardamine pratensis*, Glaucous Sedge *Carex flacca*, Oval Sedge *Carex ovalis*, *Ranunculus repens*, Meadow Buttercup *Ranunculus acris*, Marsh Thistle *Cirsium palustre*, *Galium palustre*, Meadow Vetchling *Lathyrus pratensis*, Marsh Willowherb *Epilobium palustre*, *Carex echinata*, Amphibious Bistort *Persicaria amphibia*, Tufted Vetch

Vicia cracca, *Plantago lanceolata*, *Filipendula ulmaria*, *Potentilla erecta*, Common Sorrel *Rumex acetosa*, *Ranunculus flammula*, *Cynosuros cristatus*, *Lythrum salicaria*, Common Knapweed *Centaurea nigra* and the mosses *Scleropodium purum*, *Calliergonella cuspidata*, *Thuidium tamariscinum*, *Sphagnum palustre*, and *Rhytidiadelphus squarrosus*.

These grasslands support wading birds such as Snipe *Gallinago gallinago*. Snipe were flushed at a number of locations throughout the island. The grasslands also supported a high population of such butterflies as Meadow Brown *Maniola jurtina* and Ringlet *Aphantopus hyperantus*.

Dry Siliceous Heath (HH1)

This often sheep-grazed habitat occurred on shallow peat overlying high rocky ground (**Photo 24**) stretching right down to the coast in places and in these locations could be called coastal heath.



Photo 24: Dry Heath

However all dry heath has been mapped in a general heath category either as a stand-alone habitat in its own right or in intimate, often complex, mosaics with other habitats including what

might be called wet heath (**Figure 1**). This heath has a species composition of wind-clipped carpets of *Calluna vulgaris* often intermixed with extensive carpets of the liverwort *Frullania tamarisci* and the lichen *Cladonia ciliata*. Other species included *Erica cinerea*, *Hypochoeris radicata*, Green-ribbed Sedge *Carex binervis*, *Trifolium repens*, *Potentilla erecta*, *Pilosella officinarum*, Mountain Everlasting *Antennaria dioica*, Sheep's-bit *Jasione montana*, Lousewort *Pedicularis sylvatica*, Eyebright *Euphrasia* sp., Bitter-cress *Lathyrus linifolius*, Slender St John's-wort *Hypericum pulchrum*, Heath-grass *Danthonia decumbens*, Burnet Rose *Rosa pimpinellifolia*, Devil's-bit Scabious *Succisa pratensis*, Brown Bent *Agrostis vinealis*, Milkwort *Polygala* sp., *Anthoxanthum odoratum*, Common Bird's-foot-trefoil *Lotus corniculatus*, *Thymus polytrichus*, Mat-grass *Nardus stricta*, and the bryophytes *Dicranum scoparium*, *Rhytidiadelphus loreus*, *Rhytidiadelphus triquetrus*, *Hylocomium splendens*, *Frullania tamarisci*, *Pleurozium schreberi*, and *Hypnum jutlandicum* and the lichen *Peltigera lactucifolia*. The dry heath was eroded down to bare rock and gravel in several places probably due to a combination of natural climatic factors and overgrazing by sheep. *Nardus stricta* was locally abundant indicating overgrazing. The dry heath often forms a complex mosaic with other habitats namely exposed siliceous rock, cutover bog, wet heath, Bramble stands and dense Bracken *Pteridium aquilinum*; the latter often at the sheltered bases of the rocky outcrops. The granite rocks themselves supported mats of English Stonecrop *Sedum anglicum* (**Photo 25**) and cushions of *Racomitrium lanuginosum*. The heath was in very good condition in places although blasted short by a combination of strong coastal winds and probably sheep grazing.



Photo 25: English Stonecrop *Sedum anglicum*

Wet Heath (HH3)

Wet Heath occurs on shallower peat to bog proper often in mosaic with cutover bog, dense bracken and bramble stands, wet grassland, dry siliceous heath and exposed siliceous rock. A common scenario was the wet heath and wet grassland being confined to the wet hollows between the expanses of exposed siliceous rock. However all wet heath has been mapped in a general heath category either as a stand-alone habitat in its own right or in intimate often complex mosaics with other habitats including what might be called dry heath that occurs either inland or around the coast (**Figure 1**). In some parts of the site, wet heath may have been derived from the degradation of blanket bog by drainage associated with past turbary activities. The wet heath has a species composition of *Calluna vulgaris*, Creeping Willow *Salix repens*, *Erica tetralix*, *Molinia caerulea*, *Succisa pratensis*, *Pedicularis sylvatica*, *Potentilla erecta*, and wefts of the mosses *Thuidium tamariscinum*, *Breutelia chrysocoma*, *Pleurozium schreberi*, *Sphagnum papillosum*, *Aulacomium palustre*, *Hylocomium splendens*, *Dicranum scoparium*, *Scleropodium purum* and *Rhytidiadelphus squarrosus* and the liverwort *Mylia taylorii*. Raw peat surfaces were colonised with *Carex panicea* and *Eriophorum angustifolium*. In some places, the heath is grassy in character with *Cynosuros cristatus*, *Plantago lanceolata*, *Centaurea nigra*, *Agrostis canina* and *Trifolium repens* entering the vegetation. In the more intensively grazed areas, (and also on the dry *Calluna* heath), waxcap fungi (*Hygrocybe* spp.) were abundant including *Hygrocybe pratensis*, *H. virgineus*, *H. conica* and *H. punicea*. This group of attractive brightly coloured fungi are important indicators of unimproved grasslands. In contrast to Inishmeane, these fungi were noticeably more abundant. The sheep and cattle on Inishfree Upper help to maintain the short sward height favoured by these fungi. Grazers have the full run of the island, with many of the fences in poor repair allowing easy access. Currently circa 50 sheep graze the island from November to March and circa 20 head of cattle and 10-15 calves from June to the end of October under the Rural Environment Protection Scheme (Hans Schleweck, pers. comm.).

Dense Bracken (HD1)

Bracken occurred in dense stands (**Photo 26**), often with Bramble, as a stand-alone habitat both near the coast and inland at the sheltered base of rocky outcrops or covered the dry field banks.



Photo 26: Bracken *Pteridium aquilinum* in Mosaic with Dry Heath

It also occurred as a mosaic with wet grassland, neutral grassland and machair in stands of varying density depending on location. Under the shade cast by the less dense bracken stands, plants tolerant of shade such as Honeysuckle *Lonicera periclymenum* and *Oxalis acetosella* occurred. As scrub is not common on the island, the denser Bracken and Bramble stands play a vital role in providing valuable nesting cover for breeding birds. A breeding bird survey was carried out in spring 2009. The wet heath is often uniform in structure possessing a limited number of dominant species. There was, however, no sign of heather dieback from burning or due to Heather Beetle damage anywhere on the site apart from a small area (2m²) at Grid. ref. B 71557 11673.

Machair (CD6)

The word ‘machair’ is Irish, meaning an extensive, low-lying fertile plain. The word ‘machair’ features in Irish placenames, such as Maghera Strand in County Donegal. ‘Machair’ has now become a recognised scientific term for a specific coastal feature, defined by some as a type of dune pasture (often calcareous due to a high shell content) that historically has been subject to local cultivation, and has developed in wet and windy conditions. Machair is one of the rarest habitats in Europe, found only in the north and west of Britain and Ireland. Machair has arisen by the erosion of sand dunes by the prevailing wind. The plant species richness of machair can be very high giving a blaze of colour in summer (**Photos 27-28**) from the white flowers of *Euphrasia* sp., and Wild Carrot *Daucus carota*, the yellow flowers of Buttercups *Ranunculus* spp., and *Lotus corniculatus* to the red and purple flowers of *Trifolium pratense*, and *Prunella vulgaris*.



Photo 27: Machair on Gently Undulating Ground



Photo 28: Machair on Sandy Ridge

Often there are damper areas within machair colonized by Silverweed *Potentilla anserina*, Ragged-Robin *Lychnis flos-cuculi* and *Rhinanthus minor*. Orchids are particularly diverse in machair. During this project, a special study of the orchids of the islands was carried out as part of the OrchidIreland survey which aims to update our knowledge on the status and distribution of our native orchid species (**Photos 29-30**) on the Island of Ireland.



Photo 29: Fragrant Orchid *Gymnadenia conopsea*



Photo 30: Frog Orchid *Coeloglossum viride*

The project is funded by National Parks and Wildlife Service (NPWS) and the Northern Ireland Environment Agency (NIEA), with support from CEDaR, Ulster Museum and National Biodiversity Data Centre, Waterford.

Machair is concentrated in the northeastern corner of Inishfree Upper. Species in the grassland sward comprised *Prunella vulgaris*, Violet *Viola* sp., Daisy *Bellis perennis*, *Trifolium repens*, *Carex flacca*, *Plantago lanceolata*, Dandelion *Taraxacum officinale* agg., *Succisa pratensis*, *Cynosurus cristatus*, Yarrow *Achillea millefolium*, *Euphrasia* sp., Fairy Flax *Linum catharticum*, Harebell *Campanula rotundifolia*, *Festuca rubra*, *Pilosella officinarum*, *Trifolium pratense*, Lady's Bedstraw *Galium verum*, *Prunella vulgaris*, *Hypochoeris radicata*, Frog Orchid *Coeloglossum viride*, Fragrant Orchid *Gymnadenia conopsea*, Kidney Vetch *Anthyllis vulneraria* (**Photo 31**), Common Twayblade *Listera ovata*, *Thymus polytrichus*, *Daucus carota*, *Cochlearia officinalis*, *Holcus lanatus*, Adder's-tongue *Ophioglossum vulgatum* (**Photo 32**), Common Ragwort *Senecio jacobaea*, *Ranunculus repens*, *Rumex acetosa*, *Centaurea nigra*, *Plantago lanceolata*, and *Lotus corniculatus*.



Photo 31: Kidney Vetch *Anthyllis vulneraria*



Photo 32: Adder's-tongue *Ophioglossum vulgatum*

Mosses were locally frequent, notably *Rhytidiadelphus squarrosus*, *Dicranum scoparium*, *Hypnum lacunosum*, and *Tortula ruraliformis*. Rocky outcrops penetrated the machair sward in places.

Low-intensity land use as practiced on the machair is as important for plants and animals as it is to the local people. Cattle have long played an important part in the conservation of the machair habitat. They do not graze as closely as sheep leaving more tussocks in the sward. Tussocks are good habitats for invertebrates and thus provide both food and nest sites for birds. Waders have been known to use hoof prints as nest-cups, while some Ringed Plover *Charadrius hiaticula* try to conceal their nest beside a dry cow pat. The break-up of coarse plants (such as iris root systems) further opens up and improves the pasture, with any bare patches created being good for invertebrates and as seed beds for annual plants. Dung contains the seeds and grain necessary to regenerate the ground while also adding nutrients and humus. Too much bare ground eroded (or poached) by stock can, however, encourage invasive weeds such as Ragwort. Sheep will eat this when it is young whereas cattle find it poisonous. Heavy cattle grazing in summer prevents plants from flowering or setting seed and leading to less variety of species. It also removes cover for nesting and feeding birds and increases the risk of nests being trampled. Artificial fertilisers reduce the variety of plants and tend to favour the more aggressive, but not necessarily the best, species in the grassland and therefore they should not be applied. Too many sheep can break open the thin dry soils, or rub against sand banks, thus promoting erosion.

A coastal monitoring project was carried out between 2004 and 2006. This project was the first comprehensive national survey of Irish sand dune and machair sites. Machair, which is a priority Annex I habitat under the EU Habitats Directive, was estimated to occupy 2752.6ha. It was recorded from 59 sites in counties Galway, Mayo, Sligo and Donegal during the project. Since 1996, there has been an estimated loss of 66.4ha or 2.35% of the total habitat, primarily due to restructuring of land holdings and agricultural improvement, overgrazing and general recreation. The overall conservation assessment for the habitat was that the habitat was in unfavourable-bad condition due to many machair commonages being fenced resulting in greater concentration of livestock in confined areas, overgrazing, supplementary feeding and poaching of the land (Ryle et. al., 2009). This makes the machair habitat on Inishfree Upper, which is deemed to be in good condition, all the more important in conservation terms.

Marram Dunes (CD2)

Marram *Ammophila arenaria* dunes only occurred in small patches on parts of the northern and western coasts of the island and therefore was not mapped. Other species between the Marram stems included *Carex arenaria*, *Lotus corniculatus*, *Senecio jacobaea*, Groundsel *Senecio vulgaris*, *Trifolium pratense*, Sea Champion *Silene uniflora*, Common Mouse-ear *Cerastium fontanum*, *Sedum acre*, *Cochlearia officinalis*, *Plantago lanceolata*, *Trifolium repens*, *Honckenya peploides*, *Hypochoeris radicata*, *Daucus carota*, and *Taraxacum officinale* agg.

Dry Calcareous and Neutral Grassland (GS1)

This is a very common habitat in several scattered locations, notably around many of the ruined buildings. It also forms intimate mosaics with other habitats, notably wet grassland, exposed siliceous rock, dry siliceous heath and dense bracken stands in places. It generally consists of a very rank, relatively species-poor sward. The grasses comprised *Festuca rubra*, *Cynosuros cristatus*, *Anthoxanthum odoratum*, *Dactylis glomerata*, *Holcus lanatus* and occasionally *Lolium perenne*. Herbs in the sward included *Plantago lanceolata*, *Cerastium fontanum*, *Rumex acetosa*, *Trifolium pratense*, *Ranunculus repens*, *Prunella vulgaris*, *Ranunculus repens*, *Bellis perennis*, *Taraxacum officinale* agg., *Trifolium repens*, *Centaurea nigra* and *Potentilla anserina*. Mosses consisted of *Calliergonella cuspidata*, and *Rhytidiadelphus squarrosus*. The species diversity and composition of the sward varied reflecting the degree of past improvement, and grazing history.

Marsh (GM1)

A marsh of high conservation value occurs at Grid ref. B 71037 11847 grading into wet grassland in places. The species composition of the marsh comprised *Apium nodiflorum*, *Hydrocotyle vulgaris*, *Lychnis flos-cuculi*, *Lythrum salicaria*, *Ranunculus repens*, *Angelica sylvestris*, *Iris pseudacorus*, *Osmunda regalis*, *Cardamine pratensis*, Marsh Cinquefoil *Potentilla palustris*, *Holcus lanatus*, *Dactylorhiza* sp., and occasional stands of *Juncus effusus* and *Juncus acutiflorus*. Mosses included extensive wefts of *Plagiothecium undulatum*, *Scleropodium purum*, *Thuidium tamariscinum* and *Rhytidiadelphus squarrosus*.

Lower Saltmarsh (CM1) and Upper Saltmarsh (CM2)

Small areas of saltmarsh (**Photo 33**) occur in a number of places around the island in sheltered inlets.



Photo 33: Saltmarsh

Lower Saltmarsh (CM1) is subject to more prolonged submersion by sea water and is more strongly saline than Upper Saltmarsh (CM2). As a result, it is characterised by a predominance of halophytes, or salt-tolerant plants such as Sea Arrowgrass *Triglochin maritima*, Common Saltmarsh-grass *Puccinellia maritima*, and Glassworts *Salicornia* agg., together with *Armeria maritima*, Sea Aster *Aster tripolium*, and Sea Plantain *Plantago maritima*. Upper salt marsh is subject to less frequent and less prolonged inundation by the sea and, as a result, is not as saline in character as Lower Saltmarsh (CM1). Vegetation is typically dominated by rushes (particularly Sea Rush *Juncus maritimus* and Saltmarsh Rush *Juncus gerardii*) and Sea-milkwort *Glaux maritima*.

Dry/Humid Acid Grassland (GS3)

Dry/humid acid grassland occurs within some fields on the western side of the island. This area of grassland has developed on a former area of 'lazy beds' with grassland species such as *Anthoxanthum odoratum*, *Prunella vulgaris*, *Trifolium pratense*, *Potentilla anserina*, *Cerastium fontanum*, and *Holcus lanatus* in the hollows and *Calluna vulgaris* and other heath species such as Heath Spotted-orchid *Dactylorhiza maculata*, *Carex panicea*, and *Potentilla erecta* more dominant on the drier ridges.

Littoral Rock (LR), and Littoral Sediment (LS)

Littoral Rock (**Photo 34**) occurs all around the island comprising large flat expanses of rock and extensive areas of rock pools in places containing intertidal brown, green and red algal species and fauna tolerant of exposed or more sheltered conditions (**Photo 35**).



Photo 34: Exposed Littoral Rock



Photo 35: Harbour Crab *Liocarcinus depurator*

Marine species have been incorporated into the lists of fauna and flora recorded (**Appendix 2-3**). Sand shores occur mainly on the northern coast of the island. There are also discrete, largely unvegetated, muddy shores on the north-eastern coast.

SUMMARY OF CONSERVATION VALUE OF INISHFREE UPPER

Inishfree Upper is, by and large, in a high degree of naturalness in terms of the habitats and species present. The low human population will have helped to maintain the natural history interest of the site by reducing disturbance of the wildlife and curbing intensive agricultural activities. No recent turbary was seen on the island and the old cutover bog has revegetated well as indicated by the wetness of the peat and the high bog moss cover over many areas. Dumping, however, is a problem in some areas with dumped cars on the machair at Grid ref. B 71646 12668 and a shipwreck (**Photo 36**) on the western coast at Grid. ref. B 70783 11876. Flotsam and jetsam (**Photo 37**) from passing ships were locally frequent all around the rocky shores of the island and an annual clean-up by a community group is recommended.



Photo 36: Shipwreck on Inishfree Upper



Photo 37: Litter on Shores of Inishfree Upper

Occasional illegal shooting of the legally protected Common Seal *Phoca vitulina* is also a problem. Overgrazing cannot be considered to be contributing to the erosion of the peat at the present time. However undergrazing of the wet grassland areas is a problem. If this continues, then these grasslands will eventually scrub over, with the loss of the diverse grassland flora due to overshadowing effects. In addition, wet grassland that becomes too rank is not suitable as breeding wader habitat.

HABITATS ON INISHMEANE

Rocky Sea Cliffs (CS1) and Shingle and Gravel Banks (CB1)

Moderately steep vegetated sea cliffs were most extensive on the western side of the island. The following species were recorded on more accessible rocks: *Thymus polytrichus*, *Armeria maritima*, *Plantago lanceolata*, *Festuca rubra*, *Silene uniflora*, *Plantago maritima*, *Plantago coronopus*, *Rumex crispus*, *Cochlearia officinalis*, the lichens *Ramalina siliquosa*, *Verrucaria maura* and *Caloplaca marina* and the mosses *Schistidium maritimum* (a coastal moss tolerant of salt spray) and *Homalothecium sericeum*. Shingle beach occurs on the southeastern corner of the island (**Photo 38**).



Photo 38: Shingle Beach

There was also a bank of boulders stretching from Grid ref. B 78577 28174 north to B 78606 28218), which was colonised with a *Festuca rubra*-dominated sward and occasional *Plantago lanceolata*, *Rumex acetosa*, *Armeria maritima*, *Tripleurospermum maritimum* (**Photo 39**),

Rumex crispus, *Silene uniflora*, *Cochlearia officinalis*, *Potentilla anserina* and the lichen *Ramalina siliquosa*.



Photo 39: Sea Mayweed *Tripleurospermum maritimum*

Marram Dunes (CD2)

Marram dunes are partially stabilised hills or ridges of sand that occur along the seaward edge of the main sand dune system (Fossitt, 2000). They have been mapped along with Fixed Dune (CD3) as a general sand dune habitat category on the Inishmeane habitat map (**Figure 2**).

Marram dunes (**Photo 40**) occur on the south-eastern side of the island largely comprising dense stands of Marram grass.



Photo 40: Marram Dunes

This species is sometimes intermixed with a rank sward of *Festuca rubra* further from the shore, probably representing a transitional zone between marram and fixed dunes. Other species between the marram stems included *Carex arenaria*, *Lotus corniculatus*, *Senecio jacobaea*, *Trifolium pratense*, *Silene uniflora*, *Cochlearia officinalis*, *Plantago lanceolata*, *Trifolium repens*, *Honckenya peploides*, *Hypochoeris radicata*, *Senecio vulgaris*, *Daucus carota*, *Taraxacum officinale* agg., and Colt's-foot *Tussilago farfara*.

Fixed Dunes (CD3)

Fixed dunes are stabilised ridges or hills of sand with a more or less complete cover of vegetation (Fossitt, 2000). They have been mapped along with Marram Dune (CD2) as a general sand dune habitat category on the Inishmeane habitat map (**Figure 2**). Fixed dunes (**Photo 41**) reach their zenith on the south-eastern part of the island forming classic dune ridge and hollow topography.



Photo 41: Fixed Dunes

Species comprised *Carex arenaria*, *Carex flacca*, *Daucus carota*, rank and dense *Festuca rubra*, *Senecio jacobaea*, *Senecio vulgaris*, *Potentilla anserina*, *Ranunculus repens*, *Rumex acetosa*, *Centaurea nigra*, *Plantago lanceolata*, *Lotus corniculatus*, *Galium verum*, *Achillea millefolium*, *Tussilago farfara*, *Ranunculus acris*, *Trifolium pratense*, and occasionally *Armeria maritima* and *Linum catharticum*. Mosses were locally frequent notably *Rhytidiadelphus squarrosus*, *Homalothecium sericeum* and *Tortula ruraliformis*.

Reed and Large Sedge Swamps (FS1)

Common reed *Phragmites australis* forms a large bed at Grid ref. B 78750 28812. It is intermixed with a rank *Festuca rubra* and Creeping Bent *Agrostis stolonifera* sward in places with occasional *Dactylis glomerata* and abundant *Potentilla anserina*. *Phragmites australis* also occurs in small patches elsewhere (e.g. at Grid ref. B 78806 28963).

There is a roughly rectangular-shaped area of treacherous Bulrush *Typha latifolia* swamp (**Photo 42**) bordered by long grass-covered banks at B 78443 28705 intermixed with *Juncus acutiflorus*, *Ranunculus flammula*, *Cardamine pratensis*, *Holcus lanatus*, *Lemna minor*, *Festuca rubra*,

Potentilla anserina, *Potamogeton polygonifolius*, Common Spike-rush *Eleocharis palustris*, *Pericaria amphibia*, and with extensive carpets of the moss *Calliergonella cuspidata* in more open areas.



Photo 42: Bulrush *Typha latifolia* Swamp

There was another smaller area of Bulrush swamp at B 78493 28730.

There is a brackish Grey Club-rush *Schoenoplectus tabernaemontani* swamp (Grid ref. B 78747 28964) at the northern end of the island, hemmed in to the north by dry heath on shallow peat overlying rocky ground and dune ridges. The Grey Club-rush swamp is intermixed with *Hydrocoyle vulgaris*, *Lemna minor*, *Ranunculus flammula*, *Cardamine pratensis* and the moss *Calliergonella cuspidata*. Two young plants of the potentially invasive Rhododendron *Rhododendron ponticum* had colonised the swamp but invasive plant species were largely absent from the island. This swamp grades into a large area of *Marsh (GMI)*. This brackish marsh (**Photo 43**) comprises winding channels dominated by a *Carex* sp., alternating with a *Festuca rubra*-*Agrostis stolonifera*-dominated sward. Other species in the marsh included *Dactylorhiza* sp., *Epilobium palustre*, *Hydrocotyle vulgaris*, *Ranunculus repens*, *Cardamine pratensis*,

Potentilla anserina, *Holcus lanatus*, *Angelica sylvestris*, *Trifolium pratense*, *Apium nodiflorum*, Arrowgrass *Triglochin* sp., *Juncus articulatus*, the moss *Calliergonella cuspidata* and the liverwort *Lophocolea bidentata*.



Photo 43: Grey Club-rush *Schoenoplectus tabernaemontani* Swamp

Dry Calcareous and Neutral Grassland (GS1)

This was a very common habitat (**Photo 44**), mainly in the centre of the island within old fields bound by old dry-stone walls (some in disrepair) and grass-covered banks of varying width (1-3m), but also covering the numerous tracks traversing the island.



Photo 44: Rank Neutral Grassland Covers Large Areas of Inishmeane

It generally consisted of a very rank, species-poor *Festuca rubra*-dominated sward that appears in at least some locations to have recolonised areas of cultivation, as evident by abundant weeds of disturbed ground persisting in the sward (e.g. Creeping Thistle *Cirsium arvense*, Hogweed *Heracleum sphondylium* and also Common Nettle *Urtica dioica*) and the presence of ‘lazy beds’ (e.g. at Grid Ref. B 78665 28766) used for the cultivation of potatoes – the latter representing an important part of the cultural landscape of the island. Other grasses comprised *Dactylis glomerata*, *Holcus lanatus* and occasionally *Lolium perenne*, *Cynosuros cristatus*, False Oat-grass *Arrhenatherum elatius* and Tall Fescue *Festuca arundinacea*. The species diversity and composition in the sward varied from one part of the island to another, probably depending on degrees of improvement, grazing history and soil wetness. These grasslands were however generally species-poor, although with proper grazing management they would become suitable as potential breeding wader areas.

Other herbs in the sward comprised *Centaurea nigra*, *Cerastium fontanum*, *Plantago lanceolata*, *Achillea millefolium*, *Trifolium pratense*, *Prunella vulgaris*, *Rumex acetosa*, *Trifolium pratense*, *Trifolium repens*, *Carex flacca*, *Heracleum sphondylium*, *Plantago lanceolata* and in damper

areas *Agrostis stolonifera*, *Ranunculus repens*, *Juncus acutiflorus*, *Potentilla anserina*, *Persicaria amphibia*, and *Angelica sylvestris*. In the shorter sward areas (e.g. along the tracks), the waxcap fungi *Hygrocybe pratensis* and *Hygrocybe coccinea* were found. This group of attractive brightly coloured fungi are important indicators of unimproved grasslands and rely on short swards grazed by, for example, sheep. In contrast to Inisfree Upper, these fungi were noticeably less abundant, probably due to the fact that there are 50 sheep on Inisfree Upper at present helping to maintain the optimum sward height for these fungi. The reinstatement of grazing management should help them to thrive. The rank nature of these grasslands is not surprising given the fact that they have not been grazed for 15 years. The last grazers were sheep that were on the island for a continuous period of 10 years all year round. Cattle were last on the island over 15 years ago (Charlie O'Donnell, pers. comm.). The original inhabitants would have kept donkeys for transporting goods. Small narrow drains have been dug through the grassland in places (e.g. at Grid ref. B 78627 28554). These neutral grasslands graded into dry heath in places at higher elevations at the southern tip of the island. Towards the coast, these grasslands are less improved and rank, with species often found on coastal grasslands entering the sward, notably *Armeria maritima*, *Thymus polytrichus* and *Plantago maritima*. Despite the fact that these grasslands are often disturbed and species-poor, they support the wading bird Snipe. Snipe were flushed at Grid refs. B 78570 28629 and B 78465 28531.

Amenity Grassland (Improved) (GA2)

This grassland type only occurs in front of an occupied cottage (Grid ref. B 78503 28475) comprising a species-poor *Lolium perenne*-*Festuca rubra* sward of relatively low conservation value.

Dry Siliceous Heath (HH1)

This habitat occurs on shallow peat overlying the highest ground on the northern, western and southern parts of the island (**Photo 45**).



Photo 45: Dry Heath

It has a species composition of wind-clipped carpets of *Calluna vulgaris* often intermixed with extensive carpets of the liverwort *Frullania tamarisci* and the lichen *Cladonia ciliata*. Other species included *Erica cinerea*, *Potentilla erecta*, *Blechnum spicant*, *Succisa pratensis*, *Lotus corniculatus*, *Prunella vulgaris*, *Dactylorhiza* sp., *Nardus stricta*, Crowberry *Empetrum nigrum* (**Photo 46**) and the mosses *Dicranum scoparium*, *Breutelia chrysocoma*, *Hylocomnium splendens*, *Aulacomium palustre* and *Hypnum jutlandicum*.



Photo 46: Crowberry *Empetrum nigrum*

Other species more typical of coastal areas occur within the heath closest to the shore notably *Plantago maritima*, *P. coronopus*, *Thymus polytrichus*, and *Armeria maritima*. In coastal areas, the heath can be called coastal heath. However all heath has been mapped as dry siliceous heath (**Figure 1**). The dry heath has eroded down to bare rock and gravel in several places on the highest ground (**Photo 47**) probably due to a combination of natural climatic factors and overgrazing by sheep in the past.



Photo 47: Eroded Coastal Dry Heath

In some areas, overgrazing has allowed a *Nardus stricta* sward to dominate. On the southern tip of the island, dry heath forms a complex mosaic with neutral grassland.

Dense Bracken (HD1)

Bracken stands occurred in dense stands at the sheltered base of rocky outcrops as a stand-alone habitat, or sparsely in mosaic with rank neutral grassland or fixed dunes. There is another narrow strip of dense bracken above a boulder beach on the western side of the island at B 78580 28217 intermixed with a rank *Festuca-rubra*-dominated sward.

Littoral Rock (LR), and Littoral Sediment (LS)

Littoral Rock occurs all around the island comprising large flat wave-cut platforms with extensive areas of rock pools in places containing intertidal brown, green and red algal species (**Photos 48-49**) and fauna tolerant (**Photos 50-51**) of exposed or more sheltered conditions.



Photo 48: Lower Shore Exposed at Low Tide Showing Brown Algae



Photo 49: Green Algae on Intertidal Rocks Exposed at Low Tide



Photo 50: Snake-locks Anemone *Anemonia viridis*



Photo 51: Diverse Marine Life (e.g. Worms and Sponges) Colonises Intertidal Rocks

Sand shores occur as discrete units on the more sheltered eastern side of the island. Marine species have been incorporated into the lists of fauna and flora recorded (**Appendix 2-3**).

Cutover Bog (PB4)

This habitat type often formed part of a complex mosaic of heath, grassland and flushes. Flushed areas occur in narrow strips hugging the bases of the old peat banks supporting a diverse range of higher plants and bryophytes, namely *Epilobium palustre*, *Callitriche* agg., *Ranunculus flammula*, *Lemna minor*, *Osmunda regalis*, *Juncus bulbosus*, Broad-leaved Pondweed *Potamogeton natans*, *Potamogeton polygonifolius*, *Agrostis stolonifera*, *Potentilla anserina*, *Juncus articulatus*, *Lythrum salicaria*, *Apium nodiflorum*, *Hydrocotyle vulgaris*, Forget-me-not *Myosotis* sp., *Eriophorum angustifolium*, *Persicaria amphibia*, *Juncus effusus*, Floating Club-rush *Eleogiton fluitans*, *Rorippa nasturtium-quaticum*, *Cardamine pratensis* and the bryophytes *Calliergonella cuspidata*, *Calliergon giganteum*, *Sphagnum palustre*, *S. cuspidatum*, *Aulacomium palustre*, and *Fissidens* sp.

Remnant bog species included *Schoenus nigricans* (**Photo 52**), *Narthecium ossifragum*, *Eriophorum angustifolium* and *Carex panicea*. Shallow water has accumulated on the bare eroded peat in places and these areas have colonised with *Ranunculus flammula* and *Anagallis tenella*. Heath species comprised widely distributed carpet stage *Calluna vulgaris*, *Nardus stricta*, *Empetrum nigrum*, *Dactylorhiza* sp., *Succisa pratensis*, *Agrostis vinealis*, and the mosses *Dicranum scoparium*, *Aulacomium palustre*, *Sphagnum capillifolium*, *Sphagnum inundatum*, *Hypnum jutlandicum* and *Breutelia chrysocoma*.



Photo 52: Black Bog-rush *Schoenus nigricans*

The grassland consisted of rank *Festuca rubra*-dominated grassland with *Dactylorhiza* sp., *Centaurea nigra*, *Angelica sylvestris*, *Holcus lanatus*, *Prunella vulgaris*, *Plantago lanceolata* and *Potentilla anserina* in places.

SUMMARY OF CONSERVATION VALUE OF INISHMEANE

Inishmeane, like Inishfree Upper, is by and large in a high degree of naturalness in terms of the quality of the habitats and species present. The low human population (the population of Inishmeane in 1911 was 82 (Central Statistics Office, Dublin), after which there was a steady decline until it was largely depopulated in the mid-1960s) will have helped to maintain the natural history interest of the site by reducing disturbance of the wildlife and curbing intensive agricultural activities. Flotsam and jetsam from passing ships was, however, locally frequent around the rocky shores of the island but this could be easily removed by a local community group. The peatland habitats are actively eroding down to bare rock and gravel substrates due to a combination of natural wind-induced erosion and past overgrazing. However as the island has not been grazed for 15 years, as evident by the rank nature of most of the island grasslands, overgrazing cannot be considered to be directly contributing to erosion at the present time.

Undergrazing of the wet grassland areas is, however, a problem. If this continues, then these grasslands will eventually scrub over with the loss of the grassland flora due to overshadowing effects. In addition, wet grassland that becomes too rank is not suitable as breeding wader habitat. The island has been largely abandoned since the mid-1960s and this will have helped to maintain the natural history interest of the site by curbing turbary and other intensive agricultural activities. A very small area (3m²) of recent turbary for fuel was noticed, however, in one location (Grid ref. B 78570 28946). In spite of these minor threats, much of the peripheral areas of the island are considered to be in a high degree of naturalness.

It is considered that, with careful management, further improvements to the conservation value of the island can be met. For example, the rank grasslands in the centre of the island can be managed for conservation, notably to attract threatened breeding birds such as the Corncrake, protected under Annex 1 of the EC Birds Directive. A BirdWatch Ireland Island Feasibility Study was carried out in 2001 (Barron, 2001). This study found that, due to the relative inaccessibility of such islands as Inishmeane, they have to a large extent been protected from development pressure and intensive agricultural activities. Inishmeane and Gola Island in County Donegal were deemed to offer good opportunities for encouraging Corncrake to the island. BirdWatch Ireland already carry out a programme of Mink *Mustela vison* control in order to protect the nestlings of the Corncrake and other shore birds (e.g. Ringed Plover).

CHAPTER 4: ANIMAL LIFE

MAMMALS

Otter *Lutra lutra* are known to frequent the inlet near the island pier on Inishfree Upper and were also observed offshore. It is highly likely that they also use the coastal waters of Inishmeane, even if they are not permanent residents. The Fox *Vulpes vulpes* is present on Inishfree Upper only. The Common Seal occurs around both islands. Both Otter and Common Seal are protected under Annex II of the EU Habitats Directive and also the Wildlife Act, 1976 and the Wildlife (Amendment) Act, 2000. Mink (**Photo 53**) are trapped in tube traps on both islands as part of a predator control project supported by BirdWatch Ireland to protect ground-nesting birds such as the threatened Corncrake.



Photo 53: Mink *Mustela vison*

The Irish Whale & Dolphin Group (IWDG) has been monitoring cetacean records (whales and dolphins) since 1991. Records from IWDG prove that a number of cetacean species frequent the waters around and between the west Donegal islands (e.g. Risso's Dolphin *Grampus griseus*, Bottlenose Dolphin *Tursiops truncatus*, Killer Whale *Orcinus orca*, and Minke Whale *Balaenoptera acutorostrata*).

FISH

Although commercial fishing is in decline, a diverse range of fish is caught by sea anglers around the islands. But it is the Basking Shark *Cetorhinus maximus* that deserves a special mention. Until recently, little was known about the abundance, behaviour and migratory patterns of this fish. However, due to recent research work funded by the Heritage Council and carried out by Dr Simon Berrow and NPWS, they have been increasingly recorded off the County Donegal coast including Inishmeane in recent years.

Fifty Basking Sharks were recorded off the County Donegal coast in one week in June 2009. Satellite tagging enables scientists to monitor their future migratory patterns to provide the data required to aid the conservation of these gentle filter-feeding giants of the sea. It is now known that the Basking Shark can migrate enormous distances. There is a record of one shark travelling 1,878km (1,167 miles) in 77 days across the Celtic Sea and up the western seaboard of Ireland. They are also now known to travel across the Atlantic; a Basking Shark tagged in the Isle of Man in 2007 crossed over to Newfoundland, a distance of 9,589km [5,958 miles] in 82 days!

The Basking Shark was hunted off the south and west coasts until 20 years ago. Its Irish name is Liop an Dá – unwieldy beast with two fins – or more generally Liabhán Mór, signifying a great leviathan. It was also known as Liabhán Chor Gréine – the great fish of the sun, due to its habit of swimming just below the surface.

BIRDS

The birds of County Donegal are better recorded than most other wildlife groups largely due to the legion of amateur and professional birdwatchers in the Country. The diversity of habitats in an area will largely determine the variety of bird species found so the more limited range of habitat available on Inishmeane greatly reduces the numbers of bird species relative to Inishfree Upper with its wider range of semi-natural habitats. The strength of Inishfree for birds is the extensive wet heath/cut-over bog/wet grassland mosaic which occupies most of the island. Taken with the scrubby ditches and field boundaries, it provides nesting opportunities for most of the bird species on the island. On the other hand, the dry heath and low cliff-bound coast around the west and north of Inishmeane doesn't have a parallel on Inishfree, nor does the reedbed which occupies part of the old cut-away bog in the low-lying, north-east of the island.

The heath doesn't have any definite breeding bird species that are different from what is found on Inishfree but it does support Barnacle Geese in winter.

The Islands' Special Role in Bird Conservation

County Donegal's offshore islands have a very special role in bird conservation. In recent years, they have become the last remaining stronghold in Ireland of the Corncrake – a species listed for protection under Annex 1 of the EU Birds Directive. The importance of island habitat in an overall survival plan for the Corncrake – one of only two species in Ireland that appears on the IUCN Red List of Threatened Species – is underlined by the fact that approximately one-third of Ireland's Corncrake population, or 50% of the County Donegal total, was concentrated on the north Donegal islands of Tory and Inishbofin in recent years.

However neither of the two islands studied currently has breeding Corncrakes. Inishmeane had them until recently with a peak population of 14 recorded in 2005 calling from the grasslands, cutover bog, marram dunes, and reedbeds (Sandy Alcorn, pers. comm.) but the lack of grazing or cutting has allowed the grassland to grow too rank and dense for the birds and they have died out.

Most islanders assume that the predations of Mink, which have returned despite having been eliminated a few years ago, account for the loss of the Corncrake but even without the Mink, the habitats on the island are not suitable for breeding Corncrake. Corncrakes are highly sensitive to changes in agricultural practices. They thrive in long grass but the lack of farming on Inishmeane has allowed grass to become too thick for their needs. The attraction of the Corncrake back to the islands as a breeding species will require changes in grazing management of the grasslands. The right management usually means the traditional form of farming, which would have persisted for many generations, but owing to depopulation has now ceased. An alternative is to subject at least some of the grasslands to an annual cut in summer.

A Corncrake was seen in 2009 on Inishfree Upper but did not breed. A BirdWatch Ireland Island Feasibility Study was carried out in 2001. This study found that due to the relative inaccessibility of such islands as Inishmeane, they have to a large extent been protected from development pressure and intensive agricultural activities. Inishmeane and Gola Island in County Donegal were deemed to offer good opportunities for encouraging Corncrake to the islands. The Corncrake requires tall vegetation to shelter in early in the season when it first arrives in April or May from Africa. It also requires hay meadows to breed in. The hay

meadows must be cut from the centre outwards to give the young birds a chance to escape to the edges of the field without having to leave the cover of tall grass but, even more important, they must be cut very late in the season. BirdWatch Ireland promotes non-intensive farming practices for the conservation of breeding habitat for Corncrake and an annual census of population numbers and distribution is undertaken.

Terns have largely abandoned nesting colonies on mainland Donegal due to disturbance. They survive on the islands, but not on Inishfree or Inishmeane. The trouble is that most human activity on the islands takes place during the birds' breeding season and is concentrated on the sandy shores that the Terns, and the Ringed Plovers, need. But if Terns show an interest in a patch of shore, that patch could be put temporarily out of bounds by fencing it off for the few weeks they need to rear their chicks. In any case, it would be more likely to be one of the smaller shingly patches around the west coast of Inishfree than the main beach at Fartown. Even here, disturbance could also account for their absence and although there are no confirmed records, it is likely that the rarest species, Little Tern (**Photo 54**), did breed on Inishmeane until recently. It was encouraging to see Little Tern, along with Arctic and Common Tern, feeding and roosting around the shores of Inishfree Upper with Sandwich Tern also observed. Disturbance is usually unwitting and can be reduced if people are made aware of its importance.



Photo 54: Little Tern *Sterna albifrons*

Chough is given full protection under Annex 1 of the EU Birds Directive and Annex II of the Bern Directive, and is present on both islands. This attractive red-beaked crow is a specialist of

the sparse dry heath and machair vegetation of the extreme western coasts of Ireland, nesting in caves, and occasionally in ruined houses (**Photo 55**).



Photo 55: Chough *Pyrrhocorax pyrrhocorax*

On both islands, this seems to be where one or two pairs do indeed nest. Choughs depend on a range of habitats including grazed dune systems, grazed coastal heath and coastal grassland, and strandline seaweed beds.

Chough feed in short vegetation, rotting seaweed and in dung, probing for fly and beetle larvae and other invertebrates. Cattle dung is also an important source of invertebrate food, except where the use of cattle worming agents like Ivermectin kill off the invertebrates that normally recycle dung back into the soil.

In winter, a flock of Barnacle Geese moves among the largely uninhabited islands of west Donegal between Inishkeeragh and Inishirrer (Merne and Walsh 2002 & 2003 and Walsh and Crowe 2008). Inishfree is unsuitable but the flock uses Inishmeane which is nationally important

for this species. The total number in this grouping is declining (605 in 1999, 555 in 2003, 392 in 2008). While the total County Donegal population is stable (2424 in 1999, 2057 in 2003, 2334 in 2008), it is declining as a percentage of the Irish Population (30% in 1999, 23% in 2003, 19% in 2008). In fact, the Irish population has gone up by more than 35% between 2003 and 2008. This seems to be because the increasing number of birds coming to Ireland are re-locating themselves to ever more remote, or secure, locations.

These beautiful birds nest on the cliffs of north-east Greenland and winter exclusively around the coasts of north-west Ireland and western Scotland. Research on the Inishkea Islands of County Mayo proved that their presence improved the condition of cattle. The cattle probably help the geese by lowering the vegetation to the level they need to access their favoured ground-hugging food plants. The geese return the favour by using their fine beaks to graze nutritious shoots, which cattle can't reach, and then passing most of these through their inefficient digestive systems as droppings to be hoovered up by the cattle (Cabot, 1999). This is a classic example of how the needs of wildlife and humans are often linked and work best in partnership rather than in competition.

The sandy shores of both islands are used by small numbers of wading birds, especially on migration and in winter. Sanderling *Calidris alba*, en route from breeding in the high Arctic to wintering anywhere between Donegal and the coasts of South Africa, were seen on both islands. Ringed Plover and Oystercatcher *Haematopus ostralegus* bred in small numbers on both islands and would be present all year. Other waders seen included the Curlew *Numenius arquata*, Redshank *Tringa totanus* and Dunlin *Calidris alpina*. Snipe were flushed from wet grassland in several locations on the islands. All of these could, in theory, also breed, but it is now unlikely as all are declining rapidly as breeding birds in Ireland and are now mainly winter visitors and passage migrants.

The encouragement of breeding wader populations on the islands will require the proper management of these wet grasslands through the correct timing and frequency of grazing; cattle grazing creating the tussocky wet or damp grassland preferred by breeding waders.

Strong north-west winds between July and October bring one of the most exciting bird spectacles to prominent headlands around County Donegal. From all corners of the Atlantic, a wide range of pelagic seabirds drift inshore – Shearwaters, Petrels, Skuas and others. It is only on these relatively rare occasions that these wonderful birds can be seen from land. On the September

visit to Inishmeane, reasonable conditions briefly occurred and from the north-west corner of the island, Sooty Shearwaters *Puffinus griseus* from the Falkland Islands along with Great Skuas *Stercorarius skua* from Iceland and the north of Scotland were seen passing between the western tips of Inishirrer and Umphin, at a distance of about 2 km. But, unfortunately, this remarkable migration which attracts birdwatchers to the better headlands in Mayo, Clare and west Cork would only be properly experienced from Inishfree or Inishmeane in the most extreme conditions when the birds just might take a sheltered route inside the chain of outer islands. Under more typical conditions, Aranmore lighthouse has been used with some success to experience this migration.

Other commoner seabirds that were seen migrating on 19th September 2009 included Gannets *Sula bassana*, Manx Shearwaters *Puffinus puffinus*, Fulmars *Fulmaris glacialis*, Razorbills *Alca torda* and Guillemots *Uria aalge*. All of these, along with Cormorants *Phalacrocorax carbo*, Shags *Phalacrocorax aristotelis*, Eider Duck *Somateria mollissima* and Black Guillemot *Cepphus grille* can be seen in the waters or on rocks around the islands at different times of the year. However, of these, only Black Guillemot is likely to breed around the rocky shore of our two islands and especially Inishmeane.

Neither island has a particularly long list of resident or breeding species. Lack of trees and woodland is a limiting factor. The birds are mostly the common species of scrubby heath, like Linnets *Carduelis cannabina*, Stonechats *Saxicola torquata* and Meadow Pipits *Anthus pratensis* with a Snow Bunting *Plectrophenax nivalis* seen on Inishfree Upper in November 2008. The most specialised landbirds found were the Sedge Warbler *Acrocephalus schoenobaenus* and the Reed Bunting *Emberiza schoeniclus* (**Photo 56**), both present in the reedbeds of Inishmeane.



Photo 56: Reed Bunting *Emberiza schoeniclus*

The full list of birds recorded on the islands is presented in **Appendix 2**.

MOTHS AND BUTTERFLIES

Butterflies and moths (**Photo 57-58**) are so closely related that they are best dealt with together.



Photo 57: Garden Tiger *Arctia caja*



Photo 58: Six-Spot Burnet *Zygaena filipendulae*

There are many families of each and the differences between the butterfly and moth families are no greater than the differences between the various moth families. In general, most moths fly at night and their presence largely goes undetected, despite being vastly more numerous and varied than butterflies. Ireland has only 41 butterfly species, but over 500 species of the larger (macro-) moths and over 1000 species of the smaller (micro-) moths. Micros are much harder to detect so the small numbers found during the survey do not reflect their real presence. The full list of butterflies and moths recorded on the islands is presented in **Appendix 2**.

Butterflies

Ten species were recorded on Inishfree and five on Inishmeane. The combined total was twelve. Most important was one of the Inishmeane species, the Marsh Fritillary *Euphydryas aurinia* (**Photo 59**).



Photo 59: Marsh Fritillary *Euphydryas aurinia*

In September 2009, this was recorded in the form of the distinctive tents which are made by the caterpillars, rather like very dense spiders' webs (the adults flying in June are usually much harder to detect). This butterfly is important as it is the only insect in Ireland which is given protection under Annex II of the EU Habitats Directive. It is declining severely throughout Europe and Ireland is one of its last strongholds. The food-plant of the caterpillars is *Succisa pratensis*, which is very common, but it will only be used by the Marsh Fritillary where many other conditions are also met. Marsh Fritillary could also be present on Inishfree Upper but was not seen during the present survey. Donegal has more known sites for the species than any other county but its very particular requirements make it vulnerable to general changes in land management. For example, it needs the ground to be disturbed as if by cattle or horses. But either too much grazing or too little can easily destroy a colony.

Inishfree has a close relative, the equally beautiful Dark-green Fritillary *Mesoacidalia aglaia*, which is confined in County Donegal to coastal grassland. Grayling *Hipparchia semele* also found on Inishfree is a coastal specialist in County Donegal.

Moths

The easiest way to record moths is to set traps which use an ultra-violet light to lure them into a closed box where they will spend the rest of the night until released, after being identified, in the morning. Three traps were used on both islands during the 2009 visits on two occasions each: Inishmeane (29th June and 18th September) and Inishfree (13th July and 21st August). Smaller numbers of moths were also recorded during the day; some as caterpillars (**Photo 60**).



Photo 60: Emperor Moth *Saturnia pavonia* Caterpillar

Sixty-seven species of macro-moths were recorded on Inishfree Upper and 13 micro-moths. The totals for Inishmeane were 40 macro-moths and 12 micro-moths. As the visits were spread over the season, the overlap in species between the two islands was minimised and the grand total for both islands was 84 species of macro-moths and 24 micro-moths. However, due to adverse weather conditions, moth catches are unlikely to reflect the full complement of species on the islands and further recording work in the future is required.

Most of the macro-moth species on Inishmeane can be assumed to also occur on Inishfree Upper, the larger island, but there will be a few species on each island which will not be found on the

other. It is noted that only one micro-moth species was found on both islands – the Brown China-mark *Elophila nymphaeata*. This is not an indication of the rarity of micros, as might at first be suspected. It is more likely to be that the micros are so varied and hard to detect that the selection from each island is more or less random. In fact, all 23 species probably occur on both islands.

Most species of macro-moths are common and widespread. This is almost always the case anywhere and the only species found at most locations will be a selection of these. But our two islands have a number of species which are local or specialized in their choice of habitat or food species. Barred Rivulet *Perizoma bifaciata* is a scarce southern species in Ireland. The two found on Inishfree Upper are the first records for County Donegal. Inishmeane is only the second site in County Donegal for Pretty Pinion *Perizoma blandiata*, an open country species which is now extinct in Northern Ireland and survives mainly on the Connacht coast and in the Burren of County Clare. Scotch Annulet *Gnophos obfusate* is another west coast specialist but, preferring rocky coasts, sharing the habitat with the slightly more frequent Northern Rustic *Standfussiana lucernea*. The Scotch Annulet was found on both islands but the Northern Rustic only on Inishmeane. Also on Inishmeane is the Marbled Coronet *Hadena confusa*, a sand dune species mainly found in the north-west of Ireland. Other coastal specialists are Archer's Dart *Agrotis vestigialis*, Galium Carpet *Epirrhoe galiata*, Lime-speck Pug *Eupithecia centaureata*, Small Elephant Hawk-moth *Deilephila porcellus*, Pod Lover *Hadena perplexa capsophila* and Thyme Pug *Eupithecia distinctaria* (**Photo 61**).



Photo 61: Thyme Pug *Eupithecia distinctaria*

More widespread species which are thinly distributed, and only in the western counties, are the Marsh Oblique-barred *Hypenodes humidalis* and Satyr Pug *Eupithecia satyrata*.

The micro-moths also produced some surprises. *Coleophora mayrella*, *Epinotia subocellana*, *Oegoconia* sp., *Pseudopostega crepusculella* and *Scoparia subfusca* are all first records for County Donegal. There are at least two *Oegoconia* species which cannot be distinguished from each other without dissection but, whichever one it is, these are extremely rare moths in Ireland. *Pseudopostega crepusculella* is also extremely rare. It is a tiny species only about 6mm long and was found dayflying in the dunes on Inishmeane. The others mentioned above, although not previously recorded in County Donegal, are likely to be common.

A few migrant species were recorded. These were the Painted Lady *Cynthia cardui* and Red Admiral *Vanessa atalanta* butterflies, the macro-moth Dark Sword-grass *Agrotis ipsilon* and the micro-moths Rush Veneer *Nomophila noctuella* and Diamond-backed Moth *Plutella xylostella*. This last one is a tiny species which it is hard to imagine would have flown here from the continent, yet no less than 18 were caught on Inishmeane. Small numbers of Painted Lady arrive

here most years but this year (2009) saw a real invasion with thousands landing on coastal headlands before moving on cross-country.

The dry heath habitat on Inishmeane, the dry/wet heath and wet grassland mosaic on Inishfree Upper, the machair grassland on Inishfree Upper, and the rocky shores of both are the most important habitats for butterflies and moths. That, of course, accounts for the greater part of the area of both islands but it is a measure of how natural they both are. These habitats are all rich in wildflower species.

As with many other wildlife groups, the level of grazing is crucial to the maintenance of habitats upon which butterflies and moths depend. Too much grazing, or at the wrong time, and many of the food plants of these insects will be eliminated. Too little, or none at all, and a few vigorous grass or shrub species will reduce overall food plant diversity. The extremely windy conditions on Inishmeane help to keep the heath in a healthy condition despite the lack of grazing but the grasslands on the sheltered side of the island are losing diversity. The Marsh Fritillary probably survives although it appears to be very scarce. The cattle on Inishfree Upper can potentially play a vital role in habitat management although it would be desirable if they were not present during the summer months of April to August to allow the plants to flower and set seed.

CHAPTER 5: RECOMMENDATIONS

INTRODUCTION

If these habitats are to remain in or attain favourable condition, then various legislative and financial incentives (e.g. enhanced payments under the REPS scheme or NPWS Farm Plan Scheme for designated areas or commonages) for favourable conservation land management activities (e.g. the reinstatement of traditional grazing practices, or control of predators) need to be made available to the islanders within an overall framework of sustainable economic development.

The islands fulfill many roles in addition to being a place to live: a cultural role in preserving natural, linguistic, architectural (vernacular buildings) and archaeological heritage, an environmental education role in teaching inhabitants and tourists alike about environmental sustainability (in fact, islands are particularly good at this as they are so obviously self-contained units with clear boundaries), a tourism and recreational function that although poorly developed at present might increase in the future, and finally a productive role in providing fishing grounds and grazing rights. These roles or functions can potentially conflict with each other if not carefully planned.

A multitude of projects, carefully prepared, would have no real benefit without the local knowledge of the islanders, acquired over many generations. It will involve more than a simple consultation or invitation to make comments about projects already defined or even imposed. Inhabitants, through existing bodies involved in island development should be involved in the initiating of new projects from the early stages, adopting a bottom-up approach to community involvement. They should be involved at all stages of the project: the technical and financial aspects, the market research, additional training to successfully implement the projects, the scheduling of tasks, and not only the practical implementation.

The recommendations outlined below are merely suggestions on what could be initiated on the islands with the involvement of all stakeholders. Many of the recommendations will be applicable to all Donegal Islands and not just the two islands chosen for the pilot study. Further periods of extensive consultation involving workshops, seminars and meetings will be required involving all stakeholders: Islanders, Comhdháil Oileáin na hÉireann, Comhar na nOileán Teo, Donegal County Council, Údarás na Gaeltachta and other governmental bodies and NGOs.

Consultations should ask the inhabitants to think individually about how they would like the islands to evolve (or stay).

Owing to the decline of traditional fishing and farming practices, alternative environmentally sustainable income-generating practices would be prudent. These could focus on the unique natural assets and scenic beauty of the islands including birdwatching, photography, walking and sea mammal watching. Some of these activities are already offered by local boatmen but these tend to be sporadic and piecemeal. In addition to these direct income-generating activities, indirect income would be generated in support services to these direct activities namely in the provision of B&B and hotel accommodation on or off island and ferry services to the islands; a three-month pilot ferry scheme supported by Comhar na nOileán Teo to Inishfree Upper and to the neighbouring island of Rutland started in 2009. There is also scope for exploring the possibility of initiating the production of organic vegetables for selling in farmer's markets on the mainland as well as expanding bee-keeping as low-impact cottage industries.

Financing can come from central government or from the European Community through structural funds. Financing is distributed at county level through Údarás na Gaeltachta, the County Council or directly from the Department of Community, Rural and Gaeltacht Affairs. Other funding sources for projects can come from the Western Development Commission, Northwest Tourism, the National Fund for Ireland, Rural Development Programme (LEADER) 2007-2013 through Comhar na nOileán Teo, the newly formed LEADER/Partnership Company for the inhabited offshore islands of Ireland, and The EU Programme for Peace and Reconciliation in Northern Ireland and the Border Region of Ireland (2007-2013) - 'the PEACE III Programme' through Pobal.

It is hoped that this report will be a first step in raising awareness of the natural heritage of these islands amongst the islanders and visitor alike. Other awareness-generating activities will be required; for example, workshops on plant and animal identification and monitoring. Training in practical conservation land management will also be required.

A bilingual biodiversity pack, leaflet and/or video detailing the important habitats and species on the islands would also be prudent to be distributed to locals and visitors alike. It is vital that this includes a Countyside Code of Practice tailored to the unique natural heritage of the islands. Some habitats will require little intervention apart from periodic monitoring. For example, the small patches of saltmarsh, rocky shore, exposed rock and swamp on Inishfree Upper can be left to their own devices. The cutover bog can also be left to recover further on its own. There are a

number of sources of funding available for habitat management; for example, various options under the Rural Environment Protection Scheme. Payments to island farmers under the REPS scheme are higher in recognition of the fact that farming on the islands is more costly. Some islanders on Inishfree Upper already participate in REPS. The Forest Service Native Woodland Scheme provides funding of €4952/ha (€6349/ha where oak-dominated) for woodland establishment. The applicant may also be eligible for premiums under the general Forest Service Afforestation Grant and Premium Schemes.

Environmental organisations such as BirdWatch Ireland already carry out conservation management activities on the islands and this technical expertise can be drawn on further to initiate additional conservation land management activities. The technical expertise of other environmental NGOs (e.g. Irish Wildlife Trust, Irish Peatland Conservation Council) and NPWS can also be called on. The ability to retain sustainable livestock grazing, using suitable types and numbers of livestock at the appropriate time of year, is essential to the maintenance of many important wildlife habitats on the islands.

RESOURCE MANAGEMENT SUGGESTIONS

HABITAT MANAGEMENT

Scrub/Tree Cover

- In the light of the paucity of scrub and tree cover on the islands that provide shelter and breeding sites for birds, undertake a programme of tree, scrub and hedgerow planting in strategic locations. Only native species of local provenances adapted to local soil and climatic conditions should be used. Suitable species would include Hawthorn, Blackthorn, Ash *Fraxinus excelsior*, Oak *Quercus* sp., Holly *Ilex aquifolium*, Gorse, Birch *Betula* spp. and Rowan *Sorbus aucuparia*. Suitable locations for new native hedgerows would be around the boundaries of the ruined buildings where dry-stone walls do not occur.

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Blanket Bog

- Graze with sheep between 1st March and 31st October at a maximum stocking density of 0.075 LU per hectare (equivalent to one sheep per two hectares) using fencing as necessary.
- Cattle should not be permitted on intact areas of blanket bog or the wettest areas of cutover bog by using fencing because of trampling damage (and cattle safety concerns). It is especially important that livestock are excluded from 1st November until 28th/29th February. Permit some traditional rough grazing by cattle on cutover bog.
- Do not use bog or wet areas as a location for supplementary feeding for livestock.
- Avoid cutting turf on intact (uncut) areas of bog as this will affect the drainage of the bog.
- Do not burn in an uncontrolled manner and avoid burning during the bird-nesting season (1st March to 31st August).
- Avoid reclaiming, reseeding, cultivating or planting conifers on the bog.

- Avoid the use of fertilizer, lime or herbicides on the bog.
- Do not use the bog to dump waste.

Wet Grassland

- Follow stocking rate restrictions in terms of timing of grazing and stocking levels grazing generally between 1st June and 31st December and excluding stock from 1st January until 31st May using fencing as necessary.
- Prevent overgrazing and poaching which may involve better stock management on the land concerned, by using fencing or a reduction in the overall stock numbers held on a particular holding.
- Avoid damaging the grasslands by cultivation, ploughing, reseeding and drainage of the sward.
- Control rushes where their cover exceeds 50% of the total area through controlled grazing to improve the habitat for breeding waders.
- Ensure no machinery is permitted on the grasslands from 1st April until 30th June to protect ground-nesting birds.
- Supplementary feeding sites should not be permitted on areas of species-rich grassland.
- Avoid the use of fertilizer, herbicides or pesticides.
- Control bracken that is encroaching on the grasslands as necessary by cattle grazing and trampling in early summer.

Machair

- Exclude stock from the machair between May and July to allow the flora to flower and set seed.

- Artificial fertilizers, farmland manure and lime reduce the variety of plants and tend to favour the more aggressive, but not necessarily the best, species in the machair grassland and therefore they should not be applied.

Heath

- Many areas of heath on the island have been eroded to bare rock due to an interaction between past overgrazing and the windy Atlantic climate. Experimental areas could be fenced off in the worse affected areas in an attempt to restore the heath. Avoid grazing eroded or overgrazed sites by fencing them off from livestock until they have recovered.
- Avoid supplementary feeding on heaths.
- In early summer, use grazing cattle to trample bracken that may be encroaching on the heath.
- Limit sheep stocking rates to 0.6 sheep per hectare on dry heath and 0.2 sheep per hectare on the wetter areas of heath by fencing.
- Do not plant trees on heath as this will result in overshadowing of the heath flora.
- Avoid draining, reseeding, ploughing, cultivation and fertilizing.

Swamp

- Plant new areas of reedbeds where suitable soil and hydrological conditions permit to provide additional habitat for reedbed species (such as Reed Bunting and Sedge Warbler) and migrant birds. Existing areas of damp, improved, species-poor grassland should be targeted for such features rather than areas of habitat of high conservation value.

Field Boundaries

- Draw up a field boundary management plan for all field boundaries on the islands identifying priority boundaries for regeneration or restoration.

- Dry-stone walls could be built to their original height and width, using stone characteristic of the area informed by local building traditions. The restored dry-stone wall should follow the original field boundary line. Only local stones should be used for restoration work. Sheep shelters and kelp drying racks of historical value could also be restored.

Sand Dunes

- Monitor erosion of the sand dunes on the island and, where serious erosion is occurring, take practical steps (such as building of sand trap fencing and planting of Marram grass) to prevent loss of the habitat.
- Cutting of Marram should be prohibited to prevent erosion to the dunes that form a protective function to adjacent land.
- Vehicular access through the dunes should be strictly controlled.
- Information notices pointing out the value of sand dunes as an amenity and wildlife resource and stressing the vulnerability of sand dunes to human pressure and interference could be erected in a suitable location.

Shingle/Rocky Shore

- The removal of foreshore material (such as shingle) should be very strictly controlled in that it helps protect the coast from erosion and provides nesting substrate for shore birds.

Buildings

- Seek the advice of NPWS when renovating old buildings in that these may harbour bats that are very sensitive to disturbance.
- Avoid using timber preservative chemicals to which bats are sensitive in the renovation of old buildings. NPWS can provide a list of approved preservatives.

BIRDS

- Instigate a programme of grazing and mowing management of the wet grassland and machair on the islands to provide the optimum breeding habitat for breeding waders (such as Snipe), Corncrake and Chough in conjunction with BirdWatch Ireland and NPWS. The timing of grazing and stocking rates should not be at the expense of other important habitats on the island. Grazing levels should follow any published management plans for the Special Protection Area (SPA).
- Nesting sites of shore birds (such as Ringed Plover and Terns) to be fenced off each season and protected from predators and trampling damage by dogs and people. Where visitor pressure is high, notices could be erected to deflect people before disturbance occurs.
- Put bird (and bat) boxes on the sheltered walls of the ruined buildings with the permission of the householders.
- Consider creating wader scrapes at strategic locations on the islands in conjunction with BirdWatch Ireland and with the permission of the landowners.
- Continue to support the monitoring of populations of key bird species by BirdWatch Ireland.
- Continue to promote conservation agreements for key species by BirdWatch Ireland amongst landowners.

EDUCATION AND AWARENESS

- Support an annual programme of identification workshops, training, seminars and exhibitions to the public including local schools focusing on all aspects of island heritage (such as built heritage, arts and crafts, Irish language, placenames, genealogy and natural history) involving environmental NGOs, Donegal County Council and island development bodies. This programme could tie in with National Heritage Week, National Biodiversity Week, International Biodiversity Day and World Wetlands Day.

- Place the key findings of this report including digitized habitat map and any future research findings on the Donegal County Council website.
- Facilitate the participation of the public in a Spring Watch and Autumn Watch project where biodiversity sightings on the island can be submitted to a dedicated website.
- Ensure that island stakeholders are notified of the presence of notable species and habitats on their land and the opportunities they have to help in their conservation.
- Biodiversity awareness and training programmes could be developed and guidance documents relating to conservation management techniques could be distributed annually to council staff involved in giving advice to island landowners and land managers, or who assess planning applications on the basis of impact on the biodiversity of the islands.
- Consider commissioning a biodiversity logo for Donegal Islands as a whole, for use on all promotional and awareness creation materials. This could depict a key species of importance (such as Chough, Corncrake or Tern) that breeds or has bred on the islands.
- Place interpretative boards in suitable locations on the island and on the mainland depicting the natural, landscape, historical, built and archaeological heritage of County Donegal's islands for the benefit of local communities and tourists alike.
- Fund the production of a DVD depicting the natural, landscape, historical, architectural and archaeological heritage of all Donegal islands.
- Create a general information leaflet focusing on the heritage of the islands with an accompanying map showing places of interest.
- Explore the possibility of creating a way-marked heritage trail similar to those on Aranmore involving all stakeholders on the islands – paying due cognisance to the need to prevent damage to existing habitats when designing the route.

- Consider establishing a wildlife observatory on one or both of the islands in a suitable location, in conjunction with environmental NGOs, to educate visitors on the heritage of the islands and to monitor wildlife populations for the benefit of future management plans.
- Facilitate community involvement with the management of the island's resources through opportunities to participate in habitat and species monitoring and practical conservation activities (such as tree, hedgerow and scrub planting, repair of dry-stone walls, and an annual litter clean-up) in conjunction with all stakeholders (such as island development bodies, Donegal County Council, and environmental NGOs).

WASTE MANAGEMENT

- Waste management policies to be implemented on the islands based on the principles of minimisation of waste, maximum recycling, the controlled disposal of waste, an end to dumping, burning and burying and the minimisation of waste left by visitors, according to the individual circumstances of each island.
- There could be an on-going education programme on the islands on the importance and benefits of proper waste disposal and the dangers of improper waste disposal (such as the impact on wildlife and on the image of island life projected to tourists).
- At points of entry to islands, notices could be erected asking visitors not to leave waste behind (except in waste bins) and encouraging them to take their waste home with them.
- An annual clean-up of the island with emphasis on the coastal zone could be carried out annually as part of An Taisce's National Spring Clean.

ECOTOURISM

- Tourism could be developed, in conjunction with Fáilte Ireland Northwest, County Enterprise Boards and other relevant stakeholders in a sustainable manner to ensure that no damage is done to the resources that the tourist comes to see and that local communities reap the economic benefits of such an initiative. Such initiatives should conform with the principles espoused in the existing Greenbox initiative (www.greenbox.ie) covering counties Fermanagh, Leitrim, west Cavan, north Sligo, south Donegal and north-west Monaghan, with the natural and cultural environment of the islands being promoted, and support being provided for the development of products and services which allow for sustainable use of natural marine and land resources (such as ‘island-hopping’ trail).

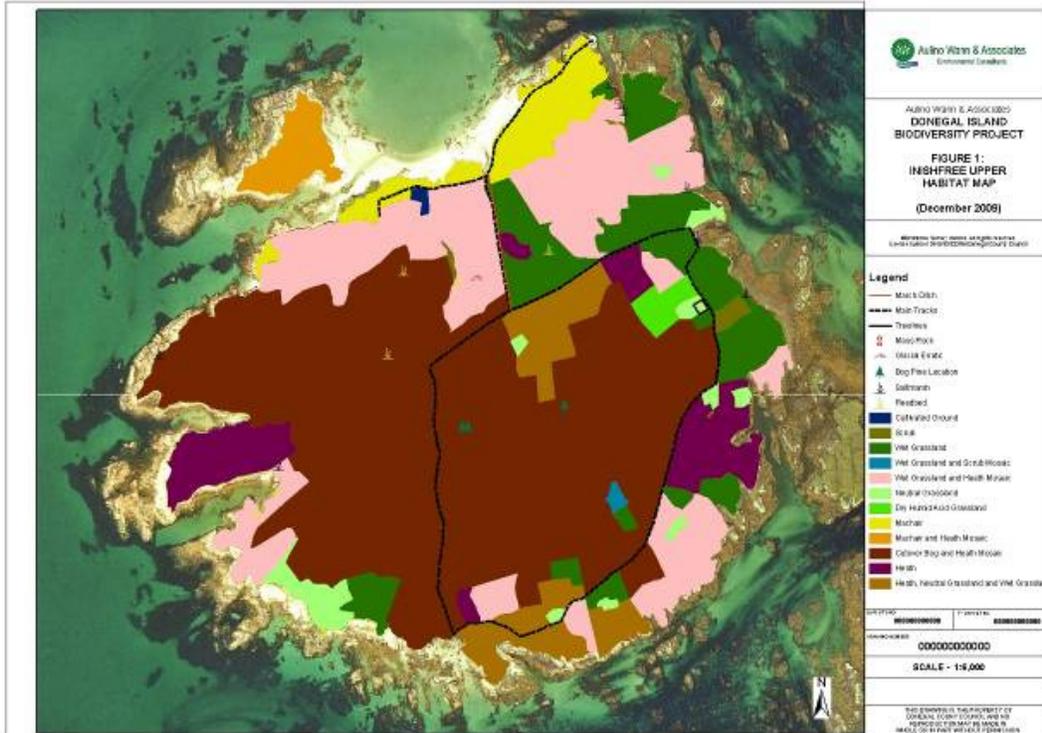
FURTHER RESEARCH

- Initiate a comprehensive historical landscape assessment of the island utilizing a combination of fieldwork and desk-based analysis of maps, estate records, newspaper articles and other sources in repositories such as the National Library of Ireland and the National and County Archives. This should include a study of the traditional and modern farming practices on the island. The results of this study should be disseminated throughout the farming sector and to the general public. The findings will be the basis for teasing out more detailed habitat management prescriptions on the island.
- Commission a marine survey of the sub-tidal marine habitats and associated species around the islands and their adjacent islets.

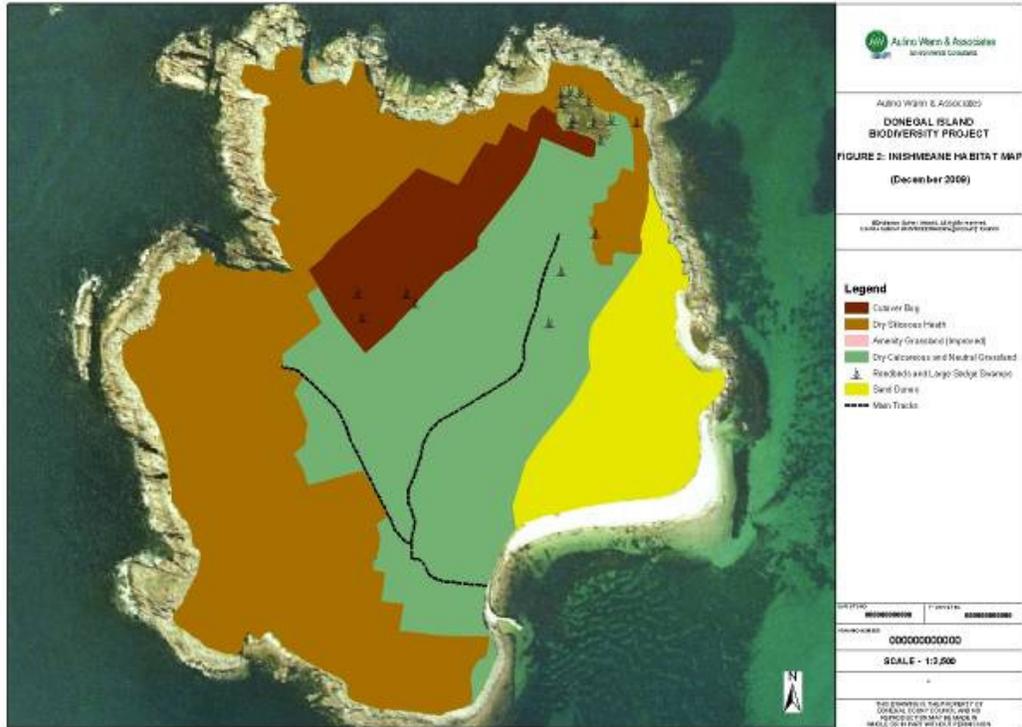
POLICY AND LEGISLATION

- Compile a collaborative detailed biodiversity action plan for each island involving all island stakeholders and promote through the local media.
- Ensure that appropriate consultation and regulatory mechanisms exist, and that agreement is reached with landowners for any changes proposed to improve the status of ecologically-sensitive sites on the island.
- Implement and enforce current statutory regulations, codes of practice and guidelines of relevance to biodiversity conservation on the island in co-operation with statutory agencies and the Gardaí.
- Incorporate any biodiversity considerations into any future local area plan for the islands.
- The availability of affordable, quality homes for permanent residents on the islands is essential to ensure the long-term viability and sustainability of island communities. However the restoration of old buildings can disturb breeding bird and bat colonies. The restoration of old buildings, therefore, should be subject to an ecological impact assessment. A pro-active approach to housing needs should be made. As a first step, this should involve an audit to establish the number, type and condition of housing stock on the islands. Restoration work and new buildings should respect the traditional styles and techniques of each island. Grant aid should be provided for the restoration of old houses exhibiting vernacular styles.
- In the case of small islands, Integrated Coastal Zone Management is likely to involve the whole territory of the island. Islanders should be consulted when local authorities are drawing up Integrated Coastal Zone Management plans.

APPENDIX 1A: HABITAT MAP OF INISHFREE UPPER



APPENDIX 1B: HABITAT MAP OF INISHMEANE



APPENDIX 2
FAUNA RECORDED ON
INISHFREE UPPER AND INISHMEANE

MAMMALS

Common Name	Scientific Name	Inishfree Upper	Inishmeane
Fox	<i>Vulpes vulpes</i>	X	
Mink	<i>Mustela vison</i>	X	X
Rabbit	<i>Oryctolagus cuniculus</i>		X
House Mouse	<i>Mus musculus</i>		X
Brown Rat	<i>Rattus norvegicus</i>	X	X
Otter	<i>Lutra lutra</i>	X	
Common Seal	<i>Phoca vitulina</i>	X	X

BIRDS¹

Common Name	Scientific Name	Inishfree Upper	Inishmeane
Arctic Tern	<i>Sterna paradisaea</i>	X	X
Blackbird	<i>Turdus merula</i>	X	
Black Guillemot	<i>Cephus grille</i>	X	X
Brent Goose	<i>Branta bernicla</i>	X	
Chough	<i>Pyrhocorax pyrrhocorax</i>	X	X
Common Gull	<i>Larus canus</i>	X	X
Common Sandpiper	<i>Actitis hypoleucos</i>	X	
Common Tern	<i>Sterna hirundo</i>		X
Cormorant	<i>Phalacrocorax carbo</i>	X	X
Cuckoo	<i>Cuculus canorus</i>	X	
Curlew	<i>Numenius arquata</i>	X	X
Dunlin	<i>Calidris alpina</i>	X	X
Duncock	<i>Prunella modularis</i>		X
Eider Duck	<i>Somateria mollissima</i>	X	
Fulmar	<i>Fulmaris glacialis</i>	X	
Gannet	<i>Sula bassana</i>	X	X
Goldfinch	<i>Carduelis carduelis</i>	X	
Great Skua	<i>Skua skua</i>	X	
Greater Black-backed Gull	<i>Larus marinus</i>	X	X
Guillemot	<i>Uria aalge</i>	X	
Heron	<i>Ardea cinerea</i>	X	X
Herring Gull	<i>Larus argentatus</i>	X	X

Hooded Crow	<i>Corvus corone</i>	X	X
Kittywake	<i>Rissa tridactyla</i>	X	X
Lesser Black-backed Gull	<i>Larus fuscus</i>		X
Linnet	<i>Carduelis cannabina</i>	X	X
Little Tern	<i>Sterna albifrons</i>		X
Manx Shearwater	<i>Puffinus puffinus</i>	X	
Meadow Pipit	<i>Anthus pratensis</i>	X	X
Oystercatcher	<i>Haematopus</i> <i>ostralegus</i>	X	X
Peregrine	<i>Falco peregrinus</i>		X
Pied Wagtail	<i>Motacilla alba</i>	X	X
Raven	<i>Corvus corax</i>	X	X
Razorbill	<i>Alca torda</i>		X
Redshank	<i>Tringa totanus</i>		X
Red-throated Diver	<i>Gavia stellata</i>	X	
Reed Bunting	<i>Emberiza schoeniclus</i>	X	
Ringed Plover	<i>Charadrius hiaticula</i>	X	X
Robin	<i>Erithacus rubecula</i>	X	X
Rock Pipit	<i>Anthus petrosus</i>	X	
Sand Martin	<i>Riparia riparia</i>		X
Sanderling	<i>Calidris alba</i>	X	X
Sandwich Tern	<i>Sterna sandvicensis</i>		X
Sedge Warbler	<i>Acrocephalus</i> <i>schoenobaenus</i>	X	
Shag	<i>Phalacrocorax</i> <i>aristotelis</i>	X	X
Skylark	<i>Alauda arvensis</i>	X	X
Snipe	<i>Gallinago gallinago</i>	X	X
Snow Bunting	<i>Plectrophenax nivalis</i>	X	
Song Thrush	<i>Turdus philomelos</i>		X
Sooty Shearwater	<i>Puffinus griseus</i>	X	
Starling	<i>Sturnus vulgaris</i>		X
Stonechat	<i>Saxicola torquata</i>	X	X
Swallow	<i>Hirundo rustica</i>	X	X
Turnstone	<i>Arenaria interpres</i>		X
Wheatear	<i>Oenanthe oenanthe</i>	X	
Willow Warbler	<i>Phylloscopus trochilus</i>		X
Wren	<i>Troglodytes</i> <i>troglodytes</i>	X	X

1Bold type indicates actual or probable breeding species

FISH

Common Name	Scientific Name	Inishfree Upper	Inishmeane
Goldsinny Wrasse	<i>Ctenolabrus rupestris</i>	X	
Two-spotted Goby	<i>Gobiusculus flavescens</i>	X	
Sand Goby	<i>Pomatoschistus minutus</i>	X	
Painted Goby	<i>Pomatoschistus pictus</i>	X	
Basking Shark	<i>Cetorhinus maximus</i>		X

INVERTEBRATES

Scientific Name	Inishfree Upper	Inishmeane
PHYLUM PORIFERA (SPONGES)		
<i>Halisarca dujardini</i>	X	
<i>Grantia compressa</i>	X	
PHYLUM CNIDARIA (JELLYFISH, SEA ANEMONES)		
<i>Dynamena pumila</i>	X	
<i>Actinia equine</i>	X	
<i>Anemonia viridis</i>	X	
<i>Urticina felina</i>	X	
<i>Anthopleura ballii</i>	X	
<i>Cereus pedunculatus</i>	X	
<i>Cyanea lamarckii</i>	X	
PHYLUM NEMERTEA (RIBBON-WORMS)		
<i>Lineus longissimus</i>	X	
PHYLUM ANNELIDA (SEGMENTED WORMS)		
<i>Chaetopterus variopedatus</i>	X	
<i>Arenicola marina</i>	X	
<i>Lanice conchilega</i>	X	
<i>Pomatoceros triqueter</i>	X	
<i>Spirorbis</i> sp.	X	
PHYLUM CRUSTACEA (CRABS, BARNACLES, WOODLICE)		
<i>Liocarcinus depurator</i>	X	
<i>Oniscus asellus</i>	X	
<i>Philoscia muscorum</i>		X
<i>Semibalanus balanoides</i>	X	
<i>Palaemon serratus</i>	X	
<i>Galathea squamifera</i>	X	
<i>Pisidia longicornis</i>	X	
<i>Macropodia rostrata</i>	X	
<i>Cancer pagurus</i>	X	
<i>Carcinus maenas</i>	X	
PHYLUM MOLLUSCA (SLUGS AND SNAILS)		
<i>Cepaea hortensis</i>	X	
<i>Cepea nemoralis</i>	X	

<i>Helix aspera</i>	X
<i>Arion ater</i>	X
<i>Lepidochitona cinerea</i>	X
<i>Tricolia pullus</i>	X
<i>Gibbula magus</i>	X
<i>Gibbula cineraria</i>	X
<i>Calliostoma zizyphinum</i>	X
<i>Patella vulgata</i>	X
<i>Helcion pellucidum</i>	X
<i>Bittium reticulatum</i>	X
<i>Lacuna pallidula</i>	X
<i>Lacuna parva</i>	X
<i>Lacuna vincta</i>	X
<i>Littorina littorea</i>	X
<i>Littorina maria</i>	X
<i>Littorina obtusata</i>	X
<i>Littorina saxatilis</i>	X
<i>Eatonina fulgida</i>	X
<i>Barleeia unifasciata</i>	X
<i>Rissoa interrupta</i>	X
<i>Rissoa lilacina</i>	X
<i>Rissoa parva</i>	X
<i>Cingula cingillus</i>	X
<i>Onoba semicostata</i>	X
<i>Lamellaria lateens</i>	X
<i>Nucella lapillus</i>	X
<i>Hinia reticulata</i>	X
<i>Hinia incrassata</i>	X
<i>Rissoella diaphana</i>	X
<i>Omalogyra atomus</i>	X
<i>Odostomia turrata</i>	X
<i>Retusa truncatula</i>	X
<i>Elysia viridis</i>	X
<i>Hermaea bifida</i>	X
<i>Musculus costulatus</i>	X
<i>Musculus discors</i>	X
<i>Heteranomia squamula</i>	X
<i>Heteranomia squamula</i>	X
<i>Lucinoma borealis</i>	X
<i>Cerastoderma edule</i>	X
<i>Spisula solida</i>	X
<i>Ensis arcuatus</i>	X

<i>Ensis siliqua</i>	X	
<i>Angulus tenuis</i>	X	
<i>Chamelea gallina</i>	X	
<i>Venerupis senegalensis</i>	X	
<i>Dosinia exoleta</i>	X	
<i>Hiatella arctica</i>	X	
<i>Oxychilus cellarius</i>	X	
<i>Trochulus hispidus</i>	X	
<i>Helicella itala</i>	X	
<i>Cochlicella acuta</i>	X	
<i>Potamopyrgus antipodarum</i>		X
<i>Stagnicola fusca</i>		X
<i>Galba truncatula</i>		X
<i>Aplexa hypnorum</i>		X
<i>Pisidium personatum</i>		X
<i>Pisidium obtusale</i>		X
PHYLUM BRYOZOA		
(SEA MATS)		
<i>Membranipora membranacea</i>	X	
<i>Electra pilosa</i>	X	
PHYLUM ECHINODERMATA		
(STARFISH, BRITTLESTARS)		
<i>Antedon bifida</i>	X	
<i>Astropecten irregularis</i>	X	
<i>Asterina gibbosa</i>	X	
<i>Asterias rubens</i>	X	
<i>Ophiothrix fragilis</i>	X	
<i>Psammechinus miliaris</i>	X	
<i>Spatangus purpureus</i>	X	
PHYLUM TUNICATA		
(SEA SQUIRTS)		
<i>Clavelina lepadiformis</i>	X	
<i>Ascidia mentula</i>	X	
<i>Botryllus schlosseri</i>	X	
PHYLUM ARTHROPODA		
ORDER ARANEAE (SPIDERS)		
<i>Xysticus cristatus</i>	X	
ORDER COLEOPTERA (BEETLES)		
<i>Agabus montanus</i>		X
<i>Amara communis</i>	X	

<i>Aphodius rufipes</i>		X
<i>Cantharis pallida</i>		X
<i>Carabus granulatus</i>		X
<i>Chrysolina banksi</i>		X
<i>Coccinella undecimpunctata</i>	X	
<i>Coccinella septempunctata</i>	X	
<i>Neocrepidodera transversa</i>	X	
<i>Rhagoxycha fulva</i>	X	
<i>Serica brunnea</i>		X
ORDER DIPTERA (FLIES)		
<i>Scatophaga stercoraria</i>	X	
<i>Tachina grossa</i>		X
ORDER HEMIPTERA (TRUE BUGS)		
<i>Nabis rugosus</i>	X	
ORDER HYMENOPTERA (ANTS, BEES, WASPS, ICHNEUMONS)		
<i>Myrmica rubra</i>		X
ORDER ODONATA (DRAGONFLIES AND DAMSELFLIES)		
<i>Sympetrum striolatum</i>	X	
ORDER ORTHOPTERA (GRASSHOPPERS)		
<i>Omocestus viridulus</i>	X	

ORDER LEPIDOPTERA**(BUTTERFLIES AND
MOTHS)****BUTTERFLIES**

Common Name	Scientific Name	Inishfree Upper	Inishmeane
Common Blue	<i>Polymmatas icarus</i>	X	X
Dark-green Fritillary	<i>Mesoacidalia aglaia</i>	X	
Grayling	<i>Hipparchia semele</i>	X	
Green-veined White	<i>Pieris napi</i>	X	
Marsh Fritillary	<i>Euphydryas aurinia</i>		X
Meadow Brown	<i>Maniola jurtina</i>	X	
Painted Lady	<i>Cynthia cardui</i>	X	X
Peacock	<i>Inachis io</i>	X	
Ringlet	<i>Aphantopus hyperantus</i>	X	
Small Heath	<i>Coenonympha pamphilus</i>	X	
Small Tortoiseshell	<i>Aglais urticae</i>	X	X
Small White	<i>Pieris rapae</i>	X	
Red Admiral	<i>Vanessa atalanta</i>		X

MACRO-MOTHS

Antler Moth	<i>Cerapteryx graminis</i>	X	
Archer's Dart	<i>Agrotis vestigialis</i>	X	
Barred Rivulet	<i>Perizoma bifaciata</i>	X	
Barred Straw	<i>Eulithis pyraliata</i>	X	
Beautiful Golden Y	<i>Autographa pulchrina</i>	X	
Bright-line Brown-eye	<i>Lacanobia oleracea</i>	X	X
Broom Moth	<i>Melanchra pisi</i>		X
Buff Ermine	<i>Spilosoma luteum</i>	X	X
Buff-tip	<i>Phalera bucephala</i>	X	
Burnished Brass	<i>Diachrysia</i>	X	X

	<i>chrysitis</i>		
Chevron	<i>Eulithis testata</i>	X	
Cinnabar	<i>Tyria jacobaeae</i>		X
Clouded-bordered Brindle	<i>Apamea crenata</i>	X	X
	<i>Epirrhoe</i>	X	X
Common Carpet	<i>alternate</i>		
Common Rustic agg.	<i>Mesapamea</i>	X	
	<i>secalis</i> agg.		
Common Wainscot	<i>Mythimna pallens</i>	X	
Crescent	<i>Celaena</i>	X	
	<i>leucostigma</i>		
Dark Arches	<i>Apamea</i>	X	X
	<i>monoglypha</i>		
Dark Sword-grass	<i>Agrotis ipsilon</i>		X
Dotted Clay	<i>Xestia baja</i>	X	
Double Dart	<i>Graphiphora</i>	X	
	<i>augur</i>		
Double Square-spot	<i>Xestia triangulum</i>	X	
Double-striped Pug	<i>Gymnoscelis</i>	X	
	<i>ruffifasciata</i>		
Drinker	<i>Euthrix potatoria</i>		X
Dusky Brocade	<i>Apamea remissa</i>	X	X
	<i>Amphipoea</i>	X	
Ear Moth agg.	<i>oculea</i> agg.		
Emperor Moth	<i>Saturnia pavonia</i>		X
Flame Shoulder	<i>Ochropleura</i>	X	X
	<i>plecta</i>		
Flounced Rustic	<i>Luperina testacea</i>	X	
	<i>Macrothylacia</i>	X	X
Fox Moth	<i>rubi</i>		
Galium Carpet	<i>Epirrhoe galiata</i>	X	X
Garden Carpet	<i>Xanthorhoe</i>		X
	<i>fluctuata</i>		
Garden Tiger	<i>Arctia caja</i>	X	
Gold Spangle	<i>Autographa</i>	X	
	<i>bractea</i>		
Grass Emerald	<i>Pseudoterpna</i>	X	
	<i>pruinata</i>		
Grass Rivulet	<i>Perizoma</i>	X	X
	<i>albulata</i>		
Heart and Dart	<i>Agrotis</i>	X	
	<i>exclamationis</i>		

Heath Rustic	<i>Xestia agathina</i>		X
Ingrailed Clay	<i>Diarsia mendica</i>	X	
July Highflyer	<i>Hydriomena</i> <i>furcata</i>	X	
Large Yellow Underwing	<i>Noctua pronuba</i>	X	X
Lesser Yellow Underwing	<i>Noctua comes</i>	X	
Lime-speck Pug	<i>Eupithecia</i> <i>centaureata</i>	X	X
Ling Pug	<i>Eupithecia</i> <i>goossensiata</i>	X	
Lunar Underwing	<i>Omphaloscelis</i> <i>lunosa</i>		X
Map-winged Swift	<i>Hepialus</i> <i>fusconebulosa</i>		X
Marbled Coronet	<i>Hadena confusa</i>		X
Marsh Oblique-barred	<i>Hypenodes</i> <i>humidalis</i>	X	
Middle-barred Minor	<i>Oligia</i> <i>fasciuncula</i>		X
Muslin Footman	<i>Nudaria mundane</i>	X	X
Narrow-winged Pug	<i>Eupithecia nanata</i>	X	X
Northern Eggar	<i>Lasiocampa</i> <i>quercus</i>		X
Northern Rustic	<i>Standfussiana</i> <i>lucernea</i>		X
Northern Spinach	<i>Eulithis populate</i>	X	
Pink-barred Sallow	<i>Xanthia togata</i>	X	
Plain Golden Y	<i>Autographa jota</i>	X	
Pod Lover	<i>Hadena perplexa</i> <i>capsophila</i>		X
Poplar Hawk-moth	<i>Laothoe populi</i>	X	X
Pretty Pinion	<i>Perizoma</i> <i>blandiata</i>		X
Red Twin-spot Carpet	<i>Xanthorhoe</i> <i>spadicearia</i>	X	
Riband Wave	<i>Idaea aversata</i>	X	
Rosy Rustic	<i>Hydraecia</i> <i>micacea</i>	X	X
Ruby Tiger	<i>Phragmatobia</i> <i>fuliginosa</i>	X	
Rustic	<i>Hoplodrina</i> <i>blanda</i>	X	

	<i>Eupithecia</i>	X	
Satyr Pug	<i>satyrata</i>		
	<i>Crocallis</i>	X	
Scalloped Oak	<i>elinguaria</i>		
	<i>Gnophos</i>	X	X
Scotch Annulet	<i>obfuscata</i>		
	<i>Scotopteryx</i>	X	
Shaded Broad-bar	<i>chenopodiata</i>		
	<i>Autographa</i>	X	X
Silver Y	<i>gamma</i>		
Single-dotted Wave	<i>Idaea dimidiata</i>	X	
	<i>Zygaena</i>	X	X
Six-spot Burnet	<i>filipendulae</i>		
	<i>Deilephila</i>		X
Small Elephant Hawk-moth	<i>porcellus</i>		
Small Square-spot	<i>Diarsia rubi</i>	X	
	<i>Chortodes</i>	X	
Small Wainscot	<i>pygmina</i>		
Smoky Wainscot	<i>Mythimna impure</i>	X	
	<i>Abrostola</i>	X	X
Spectacle	<i>tripartite</i>		
	<i>Xestia</i>	X	
Square-spot Rustic	<i>xanthographa</i>		
Straw Dot	<i>Rivula sericealis</i>	X	
	<i>Eupithecia</i>		X
Thyme Pug	<i>distinctaria</i>		
Treble-bar	<i>Aplocera plagiata</i>	X	
	<i>Lycophotia</i>	X	X
True Lover's Knot	<i>porphyrea</i>		
	<i>Spilosoma</i>	X	X
White Ermine	<i>lubricipeda</i>		
White-line Dart	<i>Euxoa tritici</i>	X	
	<i>Camptogramma</i>	X	
Yellow Shell	<i>bilineata</i>		
<u>MICRO-MOTHS</u>			
	<i>Aethes piercei</i>		X
	<i>Acleris asperana</i>	X	
	<i>Agriphila</i>	X	
	<i>straminella</i>		
Common Grass-veneer	<i>Agriphila tristella</i>	X	
	<i>Ancylis badiana</i>	X	

Timothy Tortix	<i>Aphelia paleana</i>	X	
Bee Moth	<i>Aphomia sociella</i>	X	
	<i>Crambus perlella</i>	X	
	<i>Chrysoteuchia</i>		X
	<i>culmella</i>		
	<i>Cochylimorpha</i>		X
	<i>straminea</i>		
	<i>Coleophora</i>		X
	<i>mayrella</i>		
	<i>Elophila</i>	X	X
Brown China-mark	<i>nymphaeata</i>		
	<i>Epinotia</i>	X	
	<i>subocellana</i>		
	<i>Eucosma cana</i>		X
	<i>Eudonia</i>	X	
	<i>mercurella</i>		
	<i>Micropterix</i>		X
	<i>calthella</i>		
Rush Veneer	<i>Nomophila</i>		X
	<i>noctuella</i>		
	<i>Oegoconia sp.</i>	X	
Diamond-back Moth	<i>Plutella xylostella</i>		X
	<i>Pseudopostega</i>		X
	<i>crepusculella</i>		
	<i>Scoparia</i>		X
	<i>pyralella</i>		
	<i>Scoparia subfusca</i>		X
	<i>Eurrhypara</i>	X	
Small Magpie	<i>hortulata</i>		
	<i>Udea lutealis</i>	X	

APPENDIX 3
FLORA RECORDED ON
INISHFREE UPPER AND INISHMEANE

FLOWERING PLANTS			
Common Name	Scientific Name	Inishfree Upper	Inishmeane
Sycamore	<i>Acer pseudoplatanus</i>	X	
Yarrow	<i>Achillea millefolium</i>	X	X
Velvet Bent	<i>Agrostis canina</i>	X	X
Common Bent	<i>Agrostis capillaris</i>	X	X
Creeping Bent	<i>Agrostis stolonifera</i>	X	X
Early Hair-grass	<i>Aira praecox</i>	X	X
Grey Alder	<i>Alnus incana</i>	X	
Marram	<i>Ammophila arenaria</i>	X	X
Pyramidal Orchid	<i>Anacamptis pyramidalis</i>	X	X
Bog Pimpernel	<i>Anagallis tenella</i>	X	X
Angelica	<i>Angelica sylvestris</i>	X	X
Mountain Everlasting	<i>Antennaria dioica</i>	X	X
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	X	X
Kidney Vetch	<i>Anthyllis vulneraria</i>	X	
Fool's-water-cress	<i>Apium nodiflorum</i>	X	X
Lesser Burdock	<i>Arctium minus sens. lat.</i>	X	X
Thyme-leaved Sandwort	<i>Arenaria serpyllifolia</i>	X	
Thrift	<i>Armeria maritima</i>	X	X
False- Oat-grass	<i>Arrhenatherum elatius</i> var. <i>bulbosum</i>	X	X
Sea Spleenwort	<i>Asplenium marinum</i>	X	
Sea Aster	<i>Aster tripolium</i>	X	
Lady-fern	<i>Athyrium filix-femina</i>	X	X
Spear-leaved Orache	<i>Atriplex prostrata</i>	X	X
Daisy	<i>Bellis perennis</i>	X	X
Hard-fern	<i>Blechnum spicant</i>	X	X
Soft-brome	<i>Bromus hordaceus</i>	X	
Sea Rocket	<i>Cakile maritima</i>		X
Water Star-wort	<i>Callitriche</i> agg.	X	X
Heather	<i>Calluna vulgaris</i>	X	X
Marsh Marigold	<i>Caltha palustris</i>	X	X
Harebell	<i>Campanula rotundifolia</i>	X	
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	X	
Cuckooflower	<i>Cardamine pratensis</i>	X	X

Sand Sedge	<i>Carex arenaria</i>	X	X
Green-ribbed Sedge	<i>Carex binervis</i>	X	
Star Sedge	<i>Carex echinata</i>	X	X
Long-bracted Sedge	<i>Carex extensa</i>	X	
Glaucous Sedge	<i>Carex flacca</i>	X	X
Oval Sedge	<i>Carex ovalis</i>	X	
Common Sedge	<i>Carex nigra</i>	X	X
False Fox-sedge	<i>Carex otrubae</i>	X	
Carnation Sedge	<i>Carex panicea</i>	X	X
Flea Sedge	<i>Carex pulicaris</i>	X	
Remote Sedge	<i>Carex remota</i>	X	
Bottle Sedge	<i>Carex rostrata</i>	X	
Sweet Chestnut	<i>Castanea sativa</i>	X	
Sea Fern-grass	<i>Catapodium marinum</i>	X	X
Common Knapweed	<i>Centaurea nigra</i>	X	X
Common Centaury	<i>Centaurium erythraea</i>	X	X
Red Valerian	<i>Centranthus ruber</i>		X
Sea Mouse-ear	<i>Cerastium diffusum</i>	X	X
Common Mouse-ear	<i>Cerastium fontanum</i>	X	X
Fat-hen	<i>Chenopodium album</i> agg.	X	
Creeping Thistle	<i>Cirsium arvense</i>	X	X
Meadow Thistle	<i>Cirsium dissectum</i>	X	X
Marsh Thistle	<i>Cirsium palustre</i>	X	X
Spear Thistle	<i>Cirsium vulgare</i>	X	X
Common Scurvygrass	<i>Cochlearia officinalis</i> agg.	X	X
Frog Orchid	<i>Coeloglossum viride</i>	X	
Pignut	<i>Conopodium majus</i>	X	
Hawthorn	<i>Crataegus monogyna</i>	X	
Smooth Hawk's-beard	<i>Crepis capillaris</i>	X	X
Montbretia	<i>Crocosmia x crocosmiiflora</i>	X	X
Crested Dog's-tail	<i>Cynosurus cristatus</i>	X	X
Cock's-foot	<i>Dactylis glomerata</i>	X	X
Common Spotted-orchid	<i>Dactylorhiza fuchsii</i>	X	X
	<i>Dactylorhiza incarnata</i> subsp. <i>coccinea</i>		X
	<i>Dactylorhiza incarnata</i>	X	
	<i>Dactylorhiza incarnata</i> subsp. <i>incarnata</i>		X
Western Marsh-orchid	<i>Dactylorhiza majalis</i>		X

	<i>Dactylorhiza majalis</i> subsp. <i>brevifolia</i>	X	X
Heath Spotted-orchid	<i>Dactylorhiza maculata</i>	X	X
Heath-grass	<i>Danthonia decumbens</i>	X	X
Wild Carrot	<i>Daucus carota</i>	X	X
Wavy Hair-grass	<i>Deschampsia flexuosa</i>	X	
Round-leaved Sundew	<i>Drosera rotundifolia</i>	X	X
Scaly Male-fern	<i>Dryopteris affinis</i>	X	X
Broad Buckler-fern	<i>Dryopteris dilatata</i>		X
Male-fern	<i>Dryopteris filix-mas</i>	X	X
Many-stalked Spike-rush	<i>Eleocharis multicaulis</i>	X	
Common Spike-rush	<i>Eleocharis palustris</i>	X	X
Sand Couch	<i>Elytrigia juncea</i>		X
Crowberry	<i>Empetrum nigrum</i>	X	X
Short-fruited Willowherb	<i>Epilobium obscurum</i>	X	
Marsh Willowherb	<i>Epilobium palustre</i>	X	X
Hoary Willowherb	<i>Epilobium parviflorum</i>	X	
Field Horsetail	<i>Equisetum arvense</i>	X	
Water Horsetail	<i>Equisetum fluviatile</i>	X	
Marsh Horsetail	<i>Equisetum palustre</i>	X	
Bell Heather	<i>Erica cinerea</i>	X	X
Cross-leaved Heath	<i>Erica tetralix</i>	X	X
Common Cottongrass	<i>Eriophorum angustifolium</i>	X	X
Common Stork's-bill	<i>Erodium cicutarium</i> agg.	X	
Escallonia	<i>Escallonia macrantha</i>	X	
Eyebrights	<i>Euphrasia officinalis</i> agg.	X	X
Tall Fescue	<i>Festuca arundinacea</i>		X
Red Fescue	<i>Festuca rubra</i>	X	X
Meadowsweet	<i>Filipendula ulmaria</i>	X	
Ash	<i>Fraxinus excelsior</i>	X	
Cleavers	<i>Galium aparine</i>	X	X
Marsh Bedstraw	<i>Galium palustre</i>	X	X
Lady's Bedstraw	<i>Galium verum</i>	X	X
Field Gentian	<i>Gentianella campestris</i>	X	X
Dove's-foot Crane's-bill	<i>Geranium molle</i>	X	
Herb-Robert	<i>Geranium robertianum</i>	X	
Sea-milkwort	<i>Glaux maritima</i>	X	X
Plicate Sweet-grass	<i>Glyceria notata</i>	X	
Fragrant Orchid	<i>Gymnadenia conopsea</i>	X	

	<i>Gymnadenia conopsea</i> subsp. <i>conopsea</i>	X	
	<i>Gymnadenia conopsea</i> subsp. <i>densiflora</i>	X	
Hebe	<i>Hebe</i> sp.	X	
Ivy	<i>Hedera helix</i>	X	
Hogweed	<i>Heracleum sphondylium</i>	X	X
Mare's-tail	<i>Hippuris vulgaris</i>		X
Yorkshire-fog	<i>Holcus lanatus</i>	X	X
Sea Sandwort	<i>Honckenya peploides</i>	X	X
Bluebell	<i>Hyacinthoides nonscripta</i>	X	
Marsh Pennywort	<i>Hydrocotyle vulgaris</i>	X	X
Tutsan	<i>Hypericum androsaemum</i>	X	
Slender St John's-wort	<i>Hypericum pulchrum</i>	X	
Square-stalked St John's-wort	<i>Hypericum tetrapterum</i>	X	
Cat's-ear	<i>Hypochaeris radicata</i>	X	X
Yellow Iris	<i>Iris pseudacorus</i>	X	
Bristle Club-rush	<i>Isolepis setacea</i>	X	
Sheep's-bit	<i>Jasione montana</i>	X	X
Sharp-flowered Rush	<i>Juncus acutiflorus</i>	X	X
Jointed Rush	<i>Juncus articulatus</i>	X	X
Toad Rushes	<i>Juncus bufonius sens. lat.</i>	X	X
Bulbous Rush	<i>Juncus bulbosus</i>	X	X
Compact Rush	<i>Juncus conglomeratus</i>	X	
Soft Rush	<i>Juncus effusus</i>	X	X
Saltmarsh Rush	<i>Juncus gerardii</i>	X	X
Sea Rush	<i>Juncus maritimus</i>	X	X
Crested Hair-grass	<i>Koeleria macrantha</i>	X	X
Nipplewort	<i>Lapsana communis</i>	X	
Japanese Larch	<i>Larix kaempferi</i>	X	
Bitter-vetch	<i>Lathyrus linifolius</i>	X	
Meadow Vetchling	<i>Lathyrus pratensis</i>	X	
Common Duckweed	<i>Lemna minor</i>	X	X
Autumn Hawkbit	<i>Leontodon autumnalis</i>	X	
Lyme-grass	<i>Leymus arenarius</i>	X	X
Lax-flowered Sea-lavender	<i>Limonium humile</i>	X	
Fairy Flax	<i>Linum catharticum</i>	X	X
Common Twayblade	<i>Listera ovata</i>	X	
Perennial Rye-grass	<i>Lolium perenne</i>	X	X
Honeysuckle	<i>Lonicera periclymenum</i>	X	
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	X	X

Greater Bird's-foot-trefoil	<i>Lotus pedunculatus</i>	X	X
Field Wood-rush	<i>Luzula campestris</i>	X	
Heath Wood-rush	<i>Luzula multiflora</i> subsp. <i>hibernica</i>	X	X
Ragged-Robin	<i>Lychnis flos-cuculi</i>	X	
Purple-loosestrife	<i>Lythrum salicaria</i>	X	X
Apples	<i>Malus sylvestris</i> sens. lat.	X	
Pineappleweed	<i>Matricaria discoidea</i>	X	
Water Mint	<i>Mentha aquatica</i>	X	X
Purple Moor-grass	<i>Molinia caerulea</i>	X	X
Tufted Forget-me-not	<i>Myosotis laxa</i>	X	X
Bog-myrtle	<i>Myrica gale</i>	X	
Mat-grass	<i>Nardus stricta</i>		X
Bog Asphodel	<i>Narthecium ossifragum</i>	X	X
Red Bartsia	<i>Odontites vernus</i>	X	X
Hemlock Water-dropwort	<i>Oenanthe crocata</i>	X	
Adder's-tongue	<i>Ophioglossum vulgatum</i>	X	
Early-purple Orchid	<i>Orchis mascula</i>		X
Royal Fern	<i>Osmunda regalis</i>	X	X
Wood-sorrel	<i>Oxalis acetosella</i>	X	
Lousewort	<i>Pedicularis sylvatica</i>	X	
Amphibious Bistort	<i>Persicaria amphibia</i>	X	X
Sand Cat's-tail	<i>Phleum arenarium</i>	X	
Common Reed	<i>Phragmites australis</i>	X	X
Fox-and-cubs	<i>Pilosella aurantiaca</i>	X	
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	X	
Common Butterwort	<i>Pinguicula vulgaris</i>	X	
Lodgepole Pine	<i>Pinus contorta</i>	X	
Buck's-horn Plantain	<i>Plantago coronopus</i>	X	X
Ribwort Plantain	<i>Plantago lanceolata</i>	X	X
Greater Plantain	<i>Plantago major</i>	X	X
Sea Plantain	<i>Plantago maritima</i>	X	X
Lesser Butterfly-orchid	<i>Platanthera bifolia</i>	X	X
Annual Meadow-grass	<i>Poa annua</i>	X	
Rough Meadow-grass	<i>Poa trivialis</i>	X	X
Heath Milkwort	<i>Polygala serpyllifolia</i>		X
Common Milkwort	<i>Polygala vulgaris</i>	X	
Polypodies	<i>Polypodium vulgare</i> sens. lat.	X	
Aspen	<i>Populus tremula</i>	X	
Broad-leaved Pondweed	<i>Potamogeton natans</i>		X
Bog Pondweed	<i>Potamogeton polygonifolius</i>	X	X
Silverweed	<i>Potentilla anserina</i>	X	X
Tormentil	<i>Potentilla erecta</i>	X	X

Bramble	<i>Potentilla fruticosa</i>	X	
Primrose	<i>Primula vulgaris</i>	X	X
Selfheal	<i>Prunella vulgaris</i>	X	X
Wild Plum	<i>Prunus domestica</i>	X	
Blackthorn	<i>Prunus spinosa</i>	X	
Bracken	<i>Pteridium aquilinum</i>	X	X
Common Saltmarsh-grass	<i>Puccinellia maritima</i>	X	
Meadow Buttercup	<i>Ranunculus acris</i>	X	X
Bulbous Buttercup	<i>Ranunculus bulbosus</i>	X	
Lesser Celandine	<i>Ranunculus ficaria</i>	X	
Lesser Spearwort	<i>Ranunculus flammula</i>		X
Creeping Buttercup	<i>Ranunculus repens</i>	X	X
Yellow-rattle	<i>Rhinanthus minor</i>	X	X
Rhododendron	<i>Rhododendron ponticum</i>		X
Great Yellow-cress	<i>Rorippa amphibia</i>	X	
Water-cress	<i>Rorippa nasturtium-aquaticum</i>	X	X
Dog-rose	<i>Rosa canina</i>	X	
Burnet-rose	<i>Rosa pimpinellifolia</i>	X	X
Bramble	<i>Rubus fruticosus</i> agg.	X	X
Raspberry	<i>Rubus idaeus</i>	X	
Common Sorrel	<i>Rumex acetosa</i>	X	X
Sheep's Sorrel	<i>Rumex acetosella</i>	X	X
Curled Dock	<i>Rumex crispus</i>	X	X
Rumex crispus ssp. littoreus	<i>Rumex crispus</i> ssp. <i>littoreus</i>	X	
Broad-leaved Dock	<i>Rumex obtusifolius</i>	X	X
Knotted Pearlwort	<i>Sagina nodosa</i>	X	
Procumbent Pearlwort	<i>Sagina procumbens</i>	X	X
Glassworts	<i>Salicornia</i> agg.	X	
Eared Willow	<i>Salix aurita</i>	X	
Rusty Willow	<i>Salix cinerea</i> subsp. <i>oleifolia</i>	X	
Creeping Willow	<i>Salix repens</i>	X	
Osier	<i>Salix viminalis</i>	X	
	<i>Salix x calodendron</i>	X	
	<i>Salix x multinervis</i>	X	
Elder	<i>Sambucus nigra</i>	X	
Brookweed	<i>Samolus valerandi</i>	X	X
Rue-leaved Saxifrage	<i>Saxifraga tridactylites</i>	X	
Londonpride	<i>Saxifraga x urbium</i>	X	
Grey Club-rush	<i>Scirpus tabernaemontani</i>		X
Black Bog-rush	<i>Schoenus nigricans</i>	X	X
Biting Stonecrop	<i>Sedum acre</i>	X	X
English Stonecrop	<i>Sedum anglicum</i>	X	

Marsh Ragwort	<i>Senecio aquaticus</i>	X	
Common Ragwort	<i>Senecio jacobaea</i>	X	X
Groundsel	<i>Senecio vulgaris</i>	X	X
Blue Moor-grass	<i>Sesleria caerulea</i>	X	
Sea Campion	<i>Silene uniflora</i>	X	X
Potato	<i>Solanum tuberosum</i>	X	
Goldenrod	<i>Solidago virgaurea</i>	X	X
Perennial Sow-thistle	<i>Sonchus arvensis</i>	X	
Prickly Sow-thistle	<i>Sonchus asper</i>	X	X
Smooth Sow-thistle	<i>Sonchus oleraceus</i>	X	
Greater Sea-spurrey	<i>Spergularia media</i>	X	
Marsh Woundwort	<i>Stachys palustris</i>	X	X
Bog Stitchwort	<i>Stellaria uliginosa</i>		X
Devil's-bit Scabious	<i>Succisa pratensis</i>	X	X
Russian Comfrey	<i>Symphytum x uplandicum</i>	X	
Tansy	<i>Tanacetum vulgare</i>	X	X
Dandelion	<i>Taraxacum officinale</i> agg.	X	X
Wood Sage	<i>Teucrium scorodonia</i>	X	
Wild Thyme	<i>Thymus polytrichus</i>	X	X
Lesser Trefoil	<i>Trifolium dubium</i>	X	
Zigzag Clover	<i>Trifolium medium</i>	X	
Red Clover	<i>Trifolium pratense</i>	X	X
White Clover	<i>Trifolium repens</i>	X	X
Sea Arrowgrass	<i>Triglochin maritimum</i>	X	X
Sea Mayweed	<i>Tripleurospermum maritimum</i>	X	X
Colt's-foot	<i>Tussilago farfara</i>	X	X
Bulrush	<i>Typha latifolia</i>		X
Gorse	<i>Ulex europaeus</i>		
Wych Elm	<i>Ulmus glabra</i>	X	
Common Nettle	<i>Urtica dioica</i>	X	X
Bilberry	<i>Vaccinium myrtillus</i>		X
Germander Speedwell	<i>Veronica chamaedrys</i>	X	
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	X	X
Tufted Vetch	<i>Vicia cracca</i>	X	
Bush Vetch	<i>Vicia sepium</i>	X	
Violet	<i>Viola</i> sp.	X	
Heath Dog-violet	<i>Viola canina</i>	X	X
Common Dog-violet	<i>Viola riviniana</i>	X	
Eelgrass	<i>Zostera marina</i>		X
BRYOPHYTES (MOSES AND LIVERWORTS)			
	<i>Aulacomnium palustre</i>		X

<i>Brachythecium rutabulum</i>		X
<i>Breutelia chrysocoma</i>		X
<i>Bryum pseudotriquetrum</i>		X
<i>Calliergon giganteum</i>		X
<i>Calliergonella cuspidata</i>	X	X
<i>Campylopus atrovirens</i>		X
<i>Dicranum scoparium</i>	X	X
<i>Fissidens</i> sp.		X
<i>Frullania tamariscii</i>	X	X
<i>Homalothecium lutescens</i>		X
<i>Homalothecium sericeum</i>	X	X
<i>Hylocomnium splendens</i>	X	X
<i>Hypnum jutlandicum</i>		X
<i>Hypnum lacunosum</i>	X	X
<i>Lophocolea bidentata</i>		X
<i>Mnium hornum</i>		X
<i>Odontoschisma sphagni</i>	X	
<i>Pellia epiphylla</i>		X
<i>Pleurozium schreberi</i>		X
<i>Polytrichum commune</i>	X	
<i>Racomitrium lanuginosum</i>	X	
<i>Rhizomnium punctatum</i>		X
<i>Rhytidiadelphus squarrosus</i>	X	X
<i>Schistidium marina</i>		X
<i>Sphagnum capillifolium</i>	X	X
<i>Sphagnum cuspidatum</i>		X
<i>Sphagnum inundatum</i>		X
<i>Sphagnum palustre</i>	X	X
<i>Sphagnum papillosum</i>	X	
<i>Sphagnum squarrosus</i>	X	X
<i>Sphagnum subnitens</i>		X
<i>Tortula ruraliformis</i>	X	X

RED ALGAE

<i>Catenella caespitosa</i>	X	
<i>Chondrus crispus</i>	X	
<i>Dilsea carnosa</i>	X	
<i>Polysiphonia lanosa</i>	X	

BROWN ALGAE

<i>Rhodothamniella floridula</i>	X	
<i>Ascophyllum nodosum</i>	X	
<i>Chorda filum</i>	X	
<i>Colpomenia peregrina</i>	X	

<i>Cystoseira tamariscifolia</i>	X
<i>Dictyopteris membranacea</i>	X
<i>Dictyota dichotoma</i>	X
<i>Fucus serratus</i>	X
<i>Fucus spiralis</i>	X
<i>Fucus vesiculosus</i>	X
<i>Halidrys siliquosa</i>	X
<i>Himanthalia elongata</i>	X
<i>Laminaria digitata</i>	X
<i>Laminaria hyperborea</i>	X
<i>Laminaria saccharina</i>	X
<i>Leathesia difformis</i>	X
<i>Pelvetia canaliculata</i>	X
<i>Sargassum muticum</i>	X

GREEN ALGAE

<i>Codium</i> sp.	X
<i>Enteromorpha</i> sp.	X
<i>Ulva lactuca</i>	X

FUNGI

<i>Auricularia auricula-judae</i>	X	
<i>Hygrocybe coccinea</i>		X
<i>Hygrocybe conica</i>	X	
<i>Hygrocybe pratensis</i>	X	X
<i>Hygrocybe punicea</i>	X	
<i>Hygrocybe virgineus</i>	X	

LICHENS

<i>Caloplaca marina</i>	X	
<i>Cladonia ciliata</i>	X	
<i>Cladonia portentosa</i>	X	X
<i>Cladonia uncialis</i>	X	
<i>Peltigera lactucifolia</i>		X
<i>Ramalina siliquosa</i>	X	X
<i>Verrucaria maura</i>	X	X
<i>Xanthoria</i> sp.		X

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www.birdwatchireland.ie

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www.bim.ie

Comhar na nOileán Teo.
www.oileain.ie/en/ComharnanOilean

Comhdháil Oileáin na hÉireann
www.oileain.ie

Donegal County Council
www.donegalcoco.ie

Donegal Moths
www.skylark.ie/donegalmoths

Fáilte Ireland
www.failteireland.ie

Greenbox
www.greenbox.ie

Irish Peatland Conservation Council
www.ipcc.ie

Irish Wildlife Trust
www.iwt.ie

National Parks and Wildlife Service
www.npws.ie

Northern Regional Fisheries Board
www.nrfb.ie

The Heritage Council
www.heritagecouncil.ie

Údarás na Gaeltachta
www.udaras.ie

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