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Ecology and Biodiversity Enhancement Plan for Blackrock, Co. Louth

BLACKROCK TIDY TOWNS

For Blackrock Tidy Towns

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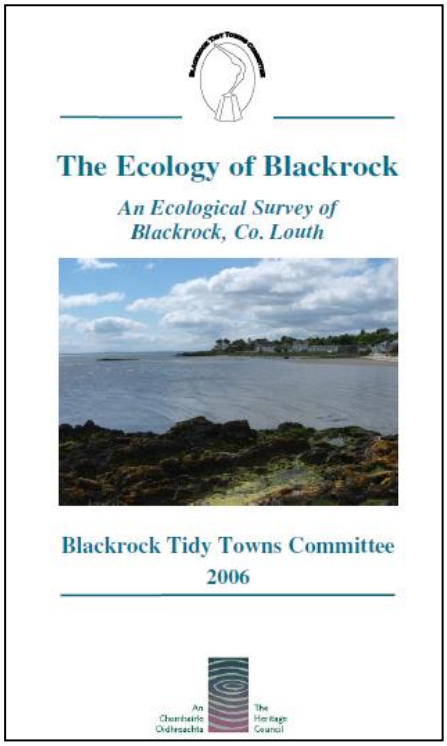
Part 1 Ecology Review

1. Introduction

BEC Consultants Ltd was commissioned by Blackrock Tidy Towns to produce a Biodiversity Enhancement Plan for Blackrock. This would have the following two objectives:

1. to revise and update the report prepared in 2006 by Roe and Merne (2006) which reviewed the ecology of the area; and
2. to provide a Biodiversity Enhancement Plan for Blackrock.

The Ecology of Blackrock (Roe and Merne 2006) is an exceptional resource, compiling the ecological data for the area that was available at the time of writing together with the findings of survey work conducted by the authors during 2006. Subsequently a Biodiversity Action Plan (Convery 2009) was conducted which built on the findings of *The Ecology of Blackrock*. This included recommendations for the appropriate management of Hamilton Marsh, one of the areas highlighted by Roe and Merne (2006) as being of ecological merit. It also recommended surveys of the birds and bats of the marsh be conducted. Both of these surveys were conducted in 2010 (Aughney 2010, Martin 2010). In addition, an assessment of Blackrock Beach (Aquafact 2009) was conducted to investigate the potential for restoring conditions suitable for sand accumulation at the beach. There is, therefore, a wealth of information available for the ecology of Blackrock village and it is timely that this be updated and the ecological information be compiled into a single document.



The revision of the Roe and Merne (2006) report is essentially conducted in Part 1, the desk-study section of this report, while the biodiversity enhancement plan is presented in Part 2. The biodiversity enhancement plan is intended to be as practical as possible, providing a framework for future management with recommendations made for particular areas. From an ecological perspective the All-Ireland Pollinator Plan (https://pollinators.ie/) has been a very positive development for the improved management of local areas for wildlife and many of the recommendations made stem from this.

To make this report as accessible as possible common names of species have been used wherever possible. For some groups there are no common names, so scientific names have been used. Also scientific names have been used if there is a potential for use of the common names to lead to confusion. Species mentioned in the text are also included in Appendix 1 and the common and scientific names are included here.

2. Study area

A survey area for the current study was devised based primarily on the Study Area Boundary adopted by Roe and Merne (2006). At the request of Blackrock Tidy Towns, Dundalk Golf Course was added. The field directly northeast of the golf course (directly north of the club house) was incorporated to create a coherent study area. At Knock Shee, in the west of the study area, the adopted study area boundary runs to the north of Knock Shee Avenue and incorporates the forested area between The Links housing development and the golf course. An eastern boundary was also added to the survey area to delimit the study area here. The deep channels evident on the aerial photograph were used to define this eastern boundary. The extent of the revised study area is shown on Figure 1.

3. Methodology

3.1. Desk study

A desk study was carried out to review the survey reports and to compile available up-to-date survey data for the study area.

The National Parks and Wildlife Service website www.npws.ie was viewed to identify the boundaries of nearby sites designated as being of conservation interest (National Parks, National Nature Reserves, Ramsar sites, Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas or proposed Natural Heritage Areas). Data were also collected on habitats listed on Annex I of the EU Habitats Directive, either within the area of study or adjacent to it.

The National Biodiversity Data Centre's (NBDC) species database https://maps.biodiversityireland.ie/Map was reviewed for species records from within the study area (using the 'Report by Polygon' facility, accessed 2/4/2019). A total of 110 different species have been recorded within the study area and entered on the NBDC website. These records are presented in Appendix 1. As one of the main tasks was to revise and update *The Ecology of Blackrock* report, this (Roe and Merne 2006) became one of the main sources of reference. Data from the Louth Wetland Surveys are available through the website www.wetlandsurveysireland.com and the survey reports (Foss *et al*. 2011, 2012) were reviewed. Additional sources include the Biodiversity Action Plan for Blackrock, including Hamilton Marsh (Convery 2009), and the bird (Martin 2010) and bat surveys (Aughney 2010) for these areas.

A review of available aerial photographic imagery and historical mapping was conducted using Google Earth and map.geohive.ie. Available mapping data were viewed in ArcGIS with the habitat map drawn up largely based on aerial photographs and with key areas identified for viewing in the field.

3.2. Field survey methodology

The survey area was visited on the 23rd and the 29th April. The initial site visit focused on the River Fane, the shoreline from the River Fane through to the centre of the village, Hamilton Marsh and Blackrock Park. The golf course was surveyed during the second visit together with the Loakers area, the northern section of the shoreline and additional visits to Blackrock Park, Hamilton Marsh.

4. Desk survey

4.1. Geology and Soils

The underlying geology of Blackrock was viewed using the viewer at www.dcenr.maps.arcgis.com. The underlying rock is composed of Silurian Greywacke. It is described as calcareous re-mica greywacke of the Clontail formation. This formation extends from Ravensdale in the north, to Castlebellingham in the south and as far west as Ballymackney. The underlying geology of the study area and the surrounding lands has limited variation. Much of the soil of Blackrock is classified as 'urban' with additional areas of 'tills derived from Lower Palaozoic sandstones and shales', though there are bands of 'marine gravel and sands' and 'alluvium'. The saltmarsh areas to the north and south of Blackrock are on Marine gravel and sands with 'estuarine silts and clays' fronting the areas of Marsh South.

4.2. Climate

Being on the east coast the climate of Blackrock is relatively dry and temperate. Annual rainfall (including sleet, snow and hail) measured at Glennane Co. Armagh was 1045.9 mm during 2005-2015 (www.timeanddate.com). The driest months are April to June, with 58-75 mm of precipitation per month, while the wettest period is October to January with 106-121 mm per month. The mean annual air temperature is 9ºC with December and January having the lowest average monthly mean temperature of 4ºC and July being the warmest with an average of 15ºC. As stated in Roe and Merne (2006) daily sunshine ranges from 1.5 hours in January to 6.5 hours in May and June with an annual mean of 4.0 hours. This equates to a total of 1,400 to 1,500 hours of sunshine per annum, which is exceeded in Ireland only by narrow coastal bands in Co. Wicklow and south-east Co. Wexford.

The climate and weather have a major influence on the ecology of Blackrock. The relatively long, mild and damp growing season results in an abundance of grasses, herbs and other plants, while the general lack of prolonged freezing weather on the coast make the area attractive to a large number of migratory birds which move in from more severe conditions in other parts of the Europe.

4.3. Hydrology

The catchment of the Fane River reaches inland in the south of the survey area but the study area is largely hydrologically distinct from this. Being on the coast and relatively low-lying the study area drains into a number of small drains and channels which discharge to the sea. Only

one of these smaller watercourses is indicated on the River Network Routes (WATER_RivNetRoutes.shp) available from the EPA and is named Haggardstown. This rises near Marl Bog Road roundabout and passes beneath the Dublin Road 160m north of the crossroads with Cocklehill Road. It runs behind the houses at St Fursey's Terrace and discharges into the Fane Estuary near where Ard Shee joins the Coast Road. A further small stream, which is partly culverted, appears to rise within the woodland southwest of the golf course. It flows around Rockville and alongside Sandy Lane, then takes a southerly course behind the Community Centre, running between the various housing developments, entering the estuary near Rock Court. In addition to these watercourses there are a small number of drains aiding run-off from the lands.

4.4. Designations

Dundalk Bay is a very large open, shallow sea bay with extensive saltmarshes and intertidal sand/mudflats. These habitats regularly support in excess of 20,000 wintering waterbirds and due to the habitats occurring and the number of birds the site is of international ecological importance. This is recognised in the designation of Dundalk Bay as both a Special Area of Conservation (SAC) and a Special Protection Area (SPA). The lands in and around the study area which are within these designations are shown in Figure 2. Additionally Dundalk Bay has been designated as a proposed Natural Heritage Area (pNHA) and also as a Ramsar Site.

SACs are designated to protect habitats and species which are listed on the EU Habitats Directive. The habitats that are listed as the Qualifying Interests for Dundalk Bay SAC are Estuaries, Tidal mudflats, Perennial vegetation of stony banks, *Salicornia* mud and two saltmarsh habitats: Atlantic salt meadows and Mediterranean salt meadows. Dundalk Bay SAC is not designated for the protection of any species listed on Annex II of the Habitats Directive.

Special Protection Areas (SPAs) are a network of sites designated for the protection of endangered wild birds. There are 23 birds listed as Qualifying Interests for Dundalk Bay SPA (NPWS 2011), all of which are over-wintering birds, together with 'wetlands and waterbirds'. These are listed below:

Great Crested Grebe (*Podiceps cristatus*)
Greylag Goose (*Anser anser*)
Light-bellied Brent Goose (*Branta bernicla hrota*)
Shelduck (*Tadorna tadorna*)
Teal (*Anas crecca*)
Mallard (*Anas platyrhynchos*)
Pintail (*Anas acuta*)
Common Scoter (*Melanitta nigra*)
Red-breasted Merganser (*Mergus serrator*)
Oystercatcher (*Haematopus ostralegus*)
Ringed Plover (*Charadrius hiaticula*)
Golden Plover (*Pluvialis apricaria*)

Grey Plover (*Pluvialis squatarola*)
Lapwing (*Vanellus vanellus*)
Knot (*Calidris canutus*)
Dunlin (*Calidris alpina*)
Black-tailed Godwit (*Limosa limosa*)
Bar-tailed Godwit (*Limosa lapponica*)
Curlew (*Numenius arquata*)
Redshank (*Tringa totanus*)
Black-headed Gull (*Chroicocephalus ridibundus*)
Common Gull (*Larus canus*)
Herring Gull (*Larus argentatus*)
Wetland and Waterbirds

In the vicinity of Blackrock the boundaries of the SAC and SPA at Dundalk Bay largely coincide but there are some differences. Along the northern edge of the Fane Estuary the SPA extends slightly further up the shore than the SAC. The difference is only in the region of 20m and this discrepancy continues along the shore of Blackrock with either one or the other designation extending slightly further inland. Additionally at The Loakers in the north of the study area the SAC extends to the west of Blackrock Road incorporating lands here. The SAC boundary does not appear to align with features visible on the aerial photographs, on the 2nd edition Ordnance Survey maps or visible on the ground. The other discrepancy is in the south of the study area where the SPA extends up the River Fane as far as the bridge over the Dublin Road while the SAC stops near the mouth of the river. The differences are not significant but it is worth being aware of the boundary locations.

There is a great deal of information available regarding SAC and SPA designations and on the ecology of Dundalk Bay on www.npws.ie. The reports available on these webpages include the Conservation Objectives for the SAC and SPA together with reports that are relevant to the habitats and species within the bay. The most accessible of these documents are the Site Synopses which summarise the features within the Dundalk Bay and their importance. Also volume 3 of the Saltmarsh Monitoring Project 2007-2008 (McCorry and Ryle 2009) includes a site report for Dundalk Bay with information specific to the saltmarshes to the north and south of Blackrock Village.

Natural Heritage Areas (NHAs) are the basic designation for wildlife areas in Ireland. Proposed Natural Heritage Areas, including Dundalk Bay pNHA, have not been statutorily designated but are significant for wildlife and habitats. Prior to statutory designation pNHAs are afforded limited protection through, for example being recognised by the local Planning Authority. However, in the case of Dundalk Bay pNHA the designation has been, in practice, superseded by designation as a Special Area of Conservation. The boundary of the pNHA coincides with the SAC boundary within the study area.

Dundalk Bay was established as a Ramsar site in 1996. These important wetland sites were designated following the Convention on Wetlands, signed in Ramsar in 1971. This is an

intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Ireland has 45 sites designated as “wetlands of international importance” and these range from bays and estuaries to lakes and bogs.

4.5. Habitats

Habitats form the natural home or environment of an animal, plant or other organism. They are also important units for site descriptions and conservation management. The main classification of habitats used in Ireland is *A Guide to Habitats in Ireland*, published by the Heritage Council (Fossitt 2000). In this report, habitats from the Fossitt classification are used, together with the habitat code e.g. ‘Muddy sand shores (LS3)’. There are additional habitat codes and names in relation to habitat protected under the EU Habitats Directive and there are obligations on the State in relation to these. From the perspective of the current report it is sufficient to be aware that the habitats within Dundalk Bay are of significant conservation importance and should remain undisturbed.

As the study area for the Blackrock Ecology Report encompasses both terrestrial and coastal habitats there is a range of habitats within the area and species associated with these. For ease of description these are separated into ‘*Marine and Coastal*’ and *‘Terrestrial’*.

Marine and coastal habitats

Mapping for the majority of the marine and coastal habitats within the study area are available for download from www.npws.ie and this mapping was utilised and adapted for this project.

Muddy sand shores (LS3)

Much of the coastal area within the study area is best described under the habitat community Muddy sand shores (Fossitt habitat community LS3). This is a habitat community between the high and low water marks (intertidal). It includes a range of sediment types which are naturally sorted due to the movement of the water. Muddy, fine sand communities are found near the shoreline and where rivers such as the River Fane enter the Bay. Fine sand communities are lower down the shore and extend to the sub-tidal zone which is permanently covered by the tide. The different particle types have different macroinvertebrate species associated with them (organisms without backbones which are visible to the naked eye, including worms, snails, and shrimps) and these help to determine the different communities that occur. More details on these communities are available in NPWS (2011).

Extensive green algal mats of Sea Lettuce would occur within this habitat and these are grazed by Pale-bellied Brent Geese and Wigeon during the winter (Roe and Merne 2006).

Saltmarshes

Saltmarshes (Lower saltmarsh CM1 and Upper saltmarsh CM2) are, in relation to the tide line, slightly higher than mudflats. They are stands of vegetation occurring in marine water which are periodically submerged by the sea. Only a specific range of species can survive in areas which are regularly inundated by the sea. The plants vary considerably depending on the

amount of time they are submerged, the level of salt in the water and the intensity of any grazing. Saltmarshes are divided into upper and lower saltmarsh types depending on where they occur in relation to the tide. The lowest part of the niche where saltmarsh communities occur is just up from the uncolonised mudflats. Typical species of this saltmarsh type are Glasswort species, Lax-flowered Sea-lavender and Common Saltmarsh Grass. This habitat is subject to invasion by the spread of the non-native species Common Cordgrass. Further up the coastal gradient Atlantic salt meadows occur. These areas have Thrift and Sea Plantain, with the grass Red Fescue and Saltmarsh Rush also occurring.

Dundalk Bay contains the most extensive saltmarshes found in Ireland (McCorry and Ryle 2009). McCorry and Ryle (2009) subdivide the saltmarsh within the Bay into four main areas. The area named Dundalk Marsh extends into the north of the survey area near The Loakers. Castlebellingham Marsh extends into the south of the survey area around the Fane Estuary. Blackrock itself is notable for having no saltmarsh development due to the topography and the outcropping bedrock. Both saltmarshes are noted in McCorry and Ryle (2009) as having grown significantly since the extent was recorded for the 2nd edition 6 inch maps. Dundalk Marsh in particular is noted as having more than doubled in width and tripled in size since mapping.

Mixed strata shores (LR4)

This community has been used to map the shoreline from the saltmarsh areas in the north through to the southern end of The Priests Beach. It is characterised by a mixture of bedrock and sand.

Sand shores (LS2)

Small sections of sandy shores are recorded, including the section of beach south of the sundial.

Marine Mammals

There are two records of marine mammals in the NBDC database for the study area. These are for Common Dolphin and Common Porpoise. Both these records appear to be recent strandings (from 2015 and 2012 respectively). In addition there is the record of Grey Seal from 2006 given by Roe and Merne (2006).

Wintering waterbirds at Blackrock

Roe and Merne (2006) prepared an excellent summary of the wintering waterbirds at Blackrock which can scarcely be improved upon. It is therefore replicated here with some of the data updated [marked in square parentheses] where this is available.

> The variety of waterbirds recorded in the Blackrock area during the autumn, winter and spring months is remarkable, and is equalled in very few other Irish wetlands. Combining the species recorded in Blackrock's three census sections it can be seen that 50 waterbird species have been recorded [between 1994 and 2006]. This diversity reflected the importance of Dundalk Bay as a whole, and the range of

habitats found within the bay. The areas of estuary, saltmarsh, intertidal mudflats and sandflats around Blackrock are a microcosm of the bay.

However, quite a number of the species recorded in the study area are rare or irregular visitors, or are present in relatively insignificant numbers. It is not intended to give details of such species in this report, but simply to record their occurrence [see Roe and Merne 2006]. Those fifteen species which occur regularly, and in significant numbers are commented upon as follows. Information on numbers and distribution in Ireland is taken mainly from Crowe (2005), while that on origins and migrations is mainly from Wernham *et al.* (2002).

Cormorant: The nearest breeding colonies are on islands off the Cos. Dublin and Down coasts, and the Irish breeding population is about 4,800 pairs (Mitchell *et al.* 2004). In the Blackrock area, most birds are found far out on the sandbanks at low tide.

Greylag Goose: The Irish wintering Greylags come from their breeding grounds in Iceland and up to 5,634 have been recorded here in recent years. Up to 1,300 of these occur regularly in Co. Louth, mainly in the Stabannan/Braganstown area (although this area appears to be abandoned recently (M. Eakin. Pers. Comm.)), and many of these visit the saltmarshes at Lurgangreen to feed in the day or roost at night. The River Fane estuary is regularly used by flocks, sometimes of up to 500 birds.

Light-bellied Brent Goose: Almost all the Light-bellied Brent Geese that overwinter around the Irish coast come from breeding grounds in the tundra of north-eastern high Arctic Canada. Breeding success at these unhospitable latitudes varies greatly and affects the overall population. In recent years numbers have varied between 20,000 and 34,000 birds, but there is a long-term upward trend in population size. Dundalk Bay generally supports about 300 of these small geese, which feed on the saltmarshes and algal mats on the flats. At Blackrock, up to 260 (most of the Dundalk Bay flock) are recorded at the three sections of shore.

Mallard: Most of the Irish Mallard population is resident (with very little immigration or emigration), and numbers up to 27,000. Dundalk Bay is one of the top ten sites in Ireland, where these ducks congregate outside the breeding season. Sometimes up to 1,200 are present. In the Blackrock area the River Fane estuary and Marsh South are favoured (up to 535 birds), although at low tide hundreds may be seen resting or feeding at the water's edge far out from Blackrock.

Pintail: Although abundant across the northern hemisphere, this handsome duck occurs in Ireland in quite small numbers (1,200 to 1,900 individuals), coming here from both Iceland and the east. Dundalk Bay, with an average of 122 birds, is the fifth most important wintering site in Ireland. The most important site is Tacumshin Lake, Co. Wexford, which has an average of 293. In the Blackrock area the favoured site is the River Fane estuary, where up to 350 have been recorded.

Oystercatcher: This large, conspicuous and noisy black-and-white wader is both an Irish resident and a common migrant from Iceland, Faeroes, Scotland and Scandinavia. The wintering population is about 40,000, and Dundalk Bay, with an average of nearly 10,000, is the most important Irish site. The mudflats and sandflats off Blackrock are a very important feeding area for Oystercatchers at low tide, with between 2,000 and 5,000 birds found in each of the three sections of shore. At high tide thousands of birds roost on the edges of the saltmarshes at Marsh South and Lurgangreen North, and also on the rocky islets at Blackrock Corniche.

Golden Plover: While a few pairs nest on the moorlands of the Irish west and north-west, most of our Golden Plover are winter visitors from Iceland, arriving mainly in October and departing in April. Because the species often feeds in inland areas away from wetlands, it is difficult to estimate the total Irish population, but it could be as high as 200,000 birds. Dundalk Bay, with an average population of over 5,000, is nationally important for Golden Plovers. However, much higher numbers have been recorded in recent winters, including 8,550 at the River Fane estuary in November 2006.

Lapwing: This species, once a common Irish breeder in lowland damp pastures, has declined drastically due to arterial and field drainage and agricultural intensification. Declines have occurred in many other parts of the European breeding range as well. In severe winters, hundreds of thousands of Lapwing move west to the relatively temperate conditions on the Atlantic fringe of the Continent, but in recent times such winters have been quite rare. A consequence of these two factors is that fewer Lapwings now occur here in winter. Nevertheless, up to 245,000 have been recorded in Ireland in recent years, with about 5,000 in Dundalk Bay. The saltmarshes at Marsh South and Lurgangreen North are favoured areas, and 2,500 have been counted at the latter.

Knot: Most of our wintering Knot come from breeding grounds in the high Arctic of Canada and Greenland, and the numbers reaching Ireland are estimated at 25,000-38,000. The great majority spend the winter in bays and estuaries on the north-east coast, of which Dundalk Bay is the most important for this species. Average numbers in recent years have been almost 10,000. When not feeding in dense flocks on the sandflats of Dundalk Bay, the birds form into huge flocks which wheel and twist and turn in the air, looking, in the distance, like clouds of smoke. Off Blackrock the flocks feed at low tide mainly on the sandier flats, where their favourite food – the small bivalve Baltic Tellin – is abundant. Numbers here reach peaks of 13,500 birds.

Dunlin: This very small wader breeds in Ireland in small numbers, but in winter 85,000-125,000 come here from their northern breeding areas. Dundalk Bay is their second most important site, after the much larger Shannon and Fergus Estuary in the south-west. The average number in the latter is 13,174, while at Dundalk Bay it is 12,149. Flocks of Dunlin are often seen feeding with Knot, though Dunlins often forage on muddy areas where they consume small marine worms. Up to 7,850 birds have been recorded in the Blackrock area.

Black-tailed Godwit: Very similar to the Bar-tailed Godwit when on the ground, this species shows black and white on its wings and tail in flight. Most of the Black-tailed Godwits occurring in Ireland as passage migrants and winter visitors come from the Icelandic breeding population. Our wintering birds number between 9,600 and 10,900, and Dundalk Bay is the fourth most important site, with an average of 1,441 birds. While Ballymascanlan Bay and the Castletown River estuary is the favourite site, the species also occurs in the River Fane estuary in significant numbers. Up to 760 have been recorded there.

Bar-tailed Godwit: The Bar-tailed Godwits which occur in Ireland in winter and on spring and autumn passage migration come from breeding grounds in the Siberian tundra. Between 13,700 and 20,300 overwinter here, and Dundalk Bay – with an average of 2,274 – is the most important Irish site. Up to 2,795 have been counted feeding on the sandflats in the Blackrock area.

Curlew: This large brown wader with a long curved bill breeds in Ireland, though numbers have declined in recent decades due to loss of nesting habitat in damp grassland and peatlands. This population is augmented for the winter months by large numbers of migrants from northern Britain, Sweden and Finland. Recent censuses indicate a wintering population of 34,000-41,000 birds, but the total may be significantly higher as the species often feeds in fields away from the surveyed wetlands. Dundalk Bay, with an average of 1,446, is the seventh most important site in Ireland, somewhat below the top three sites which support 2,350-2,550 birds. Within Dundalk Bay the Blackrock area is greatly favoured, with 500-700 birds occurring in each of the three count sections.

Redshank: Redshanks are Irish breeding birds (declining), passage migrants and winter visitors, and Iceland is the main source of our wintering birds. Between 19,650 and 20,900 are found here. Strangford Lough, Co. Down, is the most important site for Redshanks, with an average of 3,975 birds, but Dundalk Bay, with 1,927 is Ireland's fifth most important site. Of these, 500-800 are recorded in each of the three Blackrock count sections.

Black-headed Gull: This species is a common Irish breeding bird, with over 6,000 pairs nesting mainly on inland lakes and marshes. This population is joined in winter by large numbers of migrants from Scandinavia and countries around the Baltic Sea. The best estimate of the wintering population is 44,000-50,000, but this is likely to be on the low side as the species is often not counted by field observers. On available information, Dundalk Bay is the most important site in Ireland, with an average of 6,500 birds. The Blackrock area supports about one-third of the total in the bay.

Summering waterbirds at Blackrock

As for the wintering waterbirds the section from Roe and Merne (2006) has been reproduced here. Again any additions to the data are indicated [with square parentheses].

The great majority of the waterbirds recorded in Dundalk Bay (including the Blackrock area) are winter visitors from breeding grounds in more northerly area, ranging from the high Arctic tundra in north-east Canada to central Siberia in the east. The numbers of these birds have been monitored in Dundalk Bay by means of monthly counts carried out in autumn, winter and spring since 1994. However, little was known about waterbird species occurring in Dundalk Bay during the summer months, other than occasional observations (usually non-quantitative) of significant flocks of some species (e.g. Mallard, Oystercatchers, gulls) during this period. The field survey work in summer 2006 addressed this lack of information, with a series of six counts carried out in the three coastal sections of the Blackrock study area (Lurgangreen North/Fane Estuary, Blackrock Corniche, Marsh South (S)) between late May and late August.

A total of 29 waterbird species was recorded in the Blackrock area during this summer period. Almost all were non-breeding individuals of species which do not breed in Ireland and/or which do not reach breeding age until they are two or more years old. It is quite normal for such birds to “hang-around” in coastal bays and estuaries during the summer months.

Of particular interest were the following observations:

Little Egret: This species, originally from Mediterranean areas, was first recorded in Ireland in 1940, and began to breed here in 1997. Since then increasing numbers have been spreading northwards along the coast from East Cork as far as the Boyne Estuary. Their presence at Blackrock in summer suggests that they may start breeding in the area soon. [Little Egret has expanded to almost every coastal county in Ireland (www.birdwatchireland.ie accessed 15/7/19) with seven individuals recorded in September 2013 (IWeBs data)].

Mallard: This is a common, mainly resident duck species in Ireland, but the concentration of up to 264 individuals (mainly drakes) on the Fane Estuary in summer is an unusually large number.

Ruddy Shelduck: This is a very rare vagrant to Ireland and the occurrence of one on the Fane Estuary in summer 2006 is a notable record. There is the possibility that the bird was an escapee from a waterfowl collection, but a prolonged southerly airstream may have aided its passage from the small population resident in Morocco.

Oystercatcher: This species breeds in small numbers around the Irish coast, and is a passage migrant and winter visitor in much larger numbers. Oystercatchers do not breed until they are two years old, so it is commonplace to find non-breeding summering flocks in some of our coastal bays and estuaries. However, the high numbers (over 3,250) found in the Blackrock area in summer 2006 are exceptional. Cockles are a favourite food for this species and the abundance of these shellfish in Dundalk Bay can sustain large numbers of Oystercatchers.

Knot: Irish wintering Knot breed in the high Arctic tundra regions of north-east Canada and Greenland, and it is very unusual for the species to remain on our shores

during the summer months. However, in 2006 up to 1,000 Knot are known to have summered on the Irish north-east coast (Dublin to Louth), and up to 450 were recorded on the sandflats off Blackrock.

Black-headed Gull: This species is a common resident in Ireland, breeding mainly on inland lakes. In winter very large numbers of migrants arrive here, mainly from the north-east and east (e.g. Finland, Sweden, Poland). Immature birds, non-breeders and failed breeders tend to flock in coastal areas in the summer, but the finding of as many as 2,500 in July and August at Blackrock in summer 2006 was notable.

Common Gull: This species is not as common in Ireland as the name suggests, with only about 1,000 pairs breeding here, mainly in the west and north-west. The presence of about 500-600 immature birds (mainly at the Fane Estuary) in late May and early June 2006 is unprecedented. It is not clear where these birds spent the remainder of the summer: later counts produced only small numbers of Common Gulls.

Some of the summer records - especially those in May and August - probably referred to migrants on late spring passage to breeding grounds further north, or to early autumn migrants moving south again. In the case of the Grey Herons, it is likely that most of the birds seen during the summer were from the small heronry (breeding colony) at Mountain View (at the northern edge of the study area). The large concentrations of Mallard, mainly at the Fane Estuary, were largely drakes in post-breeding moult, whose mates were looking after their broods of ducklings in freshwater wetlands inland.

Fish

Roe and Merne (2006) provided a list of 39 species of fish recorded from the Blackrock study area and adjacent parts of Dundalk Bay from records provided to them by Eastern Regional Fisheries Board and from their own observations. Data from the NBDC did not add to this list.

Intertidal invertebrates

Roe and Merne (2006) sampled the larger intertidal invertebrates from the mudflats and sandflats, identifying worms, molluscs and crustaceans. In the muddier substrates of the Fane estuary and Marsh South they recorded high densities of Ragworms and *Scrobicularia plana*, with Lugworms occurring on a drier raised sandy bank at the east side of the Fane estuary and Sand Gapers were quite numerous in the mud. Small clusters of the crustacean *Corophium volutator* were found in the sloping muddy banks of the river and stream channels and runnels.

The in-fauna of the sandier shore between the above sites was dominated by Common Cockles, Banded Carpet Shells, Baltic Tellin, Lugworms and Sand Masons. The rocky

outcrops and small rocky islets were found to have a depauperate rocky shore fauna with the most numerous species found here being Periwinkles, Dogwhelks, and Acorn Barnacles.

Complementing the information from Roe and Merne (2006) are findings from intertidal surveys conducted within Dundalk Bay in 2007 and 2008 which are presented in NPWS (2011). These data were collected to determine the physical and biological nature of the bay. In the muddy fine sands which run in a narrow band along the eastern margins of the bay were the polychaete *Pygospio elegans*, the amphipod *Corophium volutator* and the bivalve *Macoma balthica*, frequently occurring in high densities. Other species commonly present included the polychaetes *Eteone longa* and *Hediste diversicolor*, the oligochaete *Tubificoides benedii* and the bivalve *Scrobicularia plana*.

In the fine sand community which extends through the area not covered by the sea at low water the community is defined by a different suite of species. The intertidal element is distinguished by the bivalve mollusc *Angulus tenuis*; the polychaetes *Nephtys hombergii* and *Nephtys cirrosa* also commonly occur here. Subtidally, the distinguishing species of the shallow subtidal estuarine channel were *Capitella capitata* and *Nephtys hombergii*, whilst the latter, along with the bivalve *Fabulina fubula*, and the polychaetes, *Owenia fusiformis*, *Lanice conchilega* and *Sigalion mathildae*, occur in the more open marine waters.

Coastal plants: Marine algae

The brown seaweed Knotted Wrack was recorded from the study area in 1987 (NBDC). Additionally Roe and Merne (2006) recorded Bladder Wrack, Spiral Wrack and Channelled Wrack, as well as Gut Weed (*Enteromorpha intestinalis*) and *Enteromorpha compressa* and Sea Lettuce (*Ulva lactuca*). It is now commonly accepted that *Enteromorpha* should be included in the *Ulva* family (www.seaweed.ie [accessed 4/4/2019]). These green algae form extensive beds on the mudflats and sandflats during the summer months and are a major source of food for Pale-bellied Brent Geese and Wigeon. As the marine algae decompose they contribute to the smell associated with the mudflats. This is a natural occurrence, often associated with days of longer and more intense sunshine.

Lichens of the splash zone

Three common species of lichen were found on outcropping rocks along the shore at Blackrock (Roe and Merne 2006). These were Black Tar Lichen, Orange Lichen and Orange Leafy Lichen.

Flowering coastal plants

The flowering plants occurring along the shore are associated with the habitats where they occur and have been considered in the sections above. The coastal habitats where plants are found are Muddy sand shores, Saltmarshes and the rocky habitats of the Mixed strata shores.

Terrestrial habitats

Terrestrial habitats are indicated on the habitat map. Urban and suburban buildings and structures and associated gardens and open spaces have been mapped collectively under Built land, gardens and hedges. Parks and spaces within the urban/suburban setting that are indicated on the Louth County Development Plan (LCC 2015) as 'Open Space' have been mapped separately (the golf course is also indicated in the development plan as an 'open space') to highlight the extent of land which is being set aside as open space.

Built land, gardens and hedges

This is a diverse collection of habitats which includes the houses and buildings of Blackrock together with the gardens and open amenity spaces within the housing developments. The main habitat types within this collection are:

- Buildings and artificial surfaces (BL3),
- Flowers and borders (BC4),
- Amenity grassland (GA2),
- Hedges (WL1),
- Treelines (WL2),
- Scattered tress and parkland (WD5),
- Stonewalls and other stonework (BL1)

These areas form a mosaic of grassland, treelines, hedges, shrubs, fruit trees, flower beds, vegetable plots, walls, banks, small ponds, drains and ditches. The ecological value of buildings and artificial surfaces is largely limited to providing nesting sites for certain bird species such as Swifts, House Martins, Swallows, Jackdaws, Starlings and House Sparrows (Roe and Merne 2006). In addition they may provide summer refuge for bats such as Common Pipistrelle. As noted in Roe and Merne (2006), rooftops and chimneys can also provide prominent song-posts for Blackbirds, Starlings and Collared Doves.

According to the Louth County Development Plan (LCC 2015) the residential areas of Blackrock are set to expand further over the coming years at the expense of agricultural fields.

Mature trees

Additional structural diversity is added to the urban/suburban area by the mature trees (best classified as Scattered trees and parkland WD5) associated with some of the large mature gardens. Collectively these provide a significant and varied resource across the study area contributing considerably toward the biodiversity of the area. They provide nesting sites for birds and also possibly summer roosts for bats.

Agricultural grassland

There are a number of areas of improved agricultural grassland (GA1) remaining within the study area. Examples include fields to the north of Hamilton Drive, to the east and west of Clermont Manor and north of Seafield Road. It should be noted these areas are zoned for residential development in the Louth County Development Plan (LCC 2015).

Arable crops BC1

Fields of arable crops (BC1) occur in the north of the study area to the east of the golf course, to the south of Marine Crescent and to the west of Haggardstown Old Graveyard. It should be noted these areas are zoned for residential development in the Louth County Development Plan (LCC 2015).

Golf course

The Golf Course is primarily composed of amenity grassland GA2, but also includes treelines (WL2), conifer woodland (WD4) and artificial lakes and ponds (FL8). As these areas are managed as a unit it is easier to consider these collectively. The golf course comprises the largest and most diverse area of terrestrial habitat within the study area. It is also of particular significance for Blackrock as it forms a large open area on the Louth County Development Plan (LCC 2015) which is zoned to remain as open space, rather than residential development.

Hedgerows

The fields within the study area are mainly separated by hedgerows (LW1). Additionally some of the land parcels which have been developed for housing have retained the hedgerows and incorporate these into the fabric of the development, though in many places they have been removed. Hedgerows are largely well-developed and mature comprising species including Hawthorn, Gorse, Blackthorn and Elder. There are occasional standard trees of Ash and Sycamore within the hedges. Some of the hedges that remain provide habitat corridors through sections of the study area.

Stonewalls

A feature of Blackrock village is the Louth bank walls which are found in locations through the village including Rock Road and Seafield Road. These are dry-stone retaining walls with the stones laid vertically. As well as being a visually pleasing feature of the village they provide habitat for a number of plants and animals. The stones themselves provide a bare rock which is an uncommon niche habitat for lichen and mosses. The gaps between the stones provide sheltered areas for insects while larger cavities can provide nesting areas for birds like wrens and also small mammals. Soil which builds up between and behind the stones provides a nutrient poor, free-draining base for wildflowers and mining bees.

Streams

As noted in the hydrology section above, the River Fane is the main watercourse in the locality. It is an important angling river with Salmon and Sea Trout (www.fisheresireland.ie [accessed 1/4/2019]), though some of the lower reaches have been canalised. Other streams within the study area are noted in Roe and Merne (2006) as supporting aquatic fauna including Frogs, invertebrates and Three-spined Stickleback.

Wetlands

Roe and Merne (2006) recorded four small extant marshes as remaining within the study area in 2006. Following on from that survey, these and some additional locations in the vicinity were investigated as part of the Louth Wetland Survey (LWS) (Foss *et al*. 2012). Information on these four areas is presented here, following the progression of these areas since 2006.

The first area (Marsh A in Roe and Merne 2006), is south of the Fairways Hotel. Roe and Merne (2006) noted it as having been partially infilled but with significant intact marsh remaining. Foss et al. (2012) noted the area as heavily impacted by infill and drainage. Small remnants of wetland vegetation restricted to drainage ditches and a small degraded marsh area in southern part. In 2019 there was building works on-going and it was not possible to access. From review of aerial photos the area of semi-natural habitat appeared to have been reduced in recent years but it was zoned as open space.

Marsh B from Roe and Merne (2006) is Hamilton Marsh of which more detail is given later. The Louth Wetland Survey (Foss *et al.* 2012) recorded this site as follows: “Eastern part of site is freshwater marsh with *Typha latifolia, Equisetum fluviatile* and *Iris pseudacorus*. Site grades into wet grassland to the west. Site used as amenity - signage has been erected and a well maintained path borders northern side.”

Marsh C is on the southern side of the R172 at The Loakers. Roe and Merne (2006) describe the area in some detail: “Yellow Iris and Meadowsweet, with occasional patches of Meadow Vetchling, Marsh Thistle, Meadow Buttercup, Creeping Buttercup, Water Mint, Marsh Cinquefoil, Marsh Foxtail, Silverweed, Purple Loosestrife, Common Marsh Bedstraw, Creeping Bent, Red Fescue, Yorkshire Fog, various Sedges, Soft Rush, Hard Rush and *Polygonum* species. Common Reed is present at the pond at Mountain View, and there is a large stand of this across the road in the upper saltmarsh. A small stream runs from this marsh and has Sea Rush on its margins.” This area remains extant in 2019 and appears largely unchanged from the description given here. It is partially within Dundalk Bay SAC; it is indicated for development on the Louth County Development Plan (LCC 2015).

Marsh D from Roe and Merne (2006) was recorded as “much degraded by infilling” but “still ecologically diverse and supports interesting marshland plants and animals”. In 2012 the Louth wetland Survey described it as: “There is only a small isolated remnant wetland area remaining which comprises *Phragmites australis* reed swamp and *Typha latifolia* reed swamp. Elsewhere a mosaic of dry meadow and recolonising bare ground has established on areas of spoil.” This area appears extant in 2019 but is indicated for development on the Louth County Development Plan (LCC 2015).

An additional wetland area occurs at the back of The Links joining into the habitat in the southeast of the golf course and the lake which is here. Though partly culverted the area supports Yellow Iris, Soft Rush and Yorkshire Fog. A continuation of this wetland to the south of the Old Golf Links Road where a small area of wet grassland remains in addition to small areas of open water.

Terrestrial mammals

Roe and Merne (2006) presented a list of terrestrial mammals based on those indicated in Hayden and Harrington (2000). The same list is presented here and supplemented with additional records from NBDC.

Hedgehog: There are records of Hedgehog from Blackrock Park and the golf course (both 2017) on the NBDC website. The species is common and widespread in Ireland.

Pygmy Shrew: Reported as brought in by a domestic cat, and also heard squeaking in long grass (Roe and Merne 2006). There are recent records of this species from The Links, from Hamilton Marsh and through the survey area. Though common and widespread in Ireland there are very few records from County Louth and it is likely to be under-recorded.

Rabbit: The species is common and widespread in Ireland. There is one record of this species for the study area on NBDC from the golf course (2017) and it is likely this species is under-recorded.

Irish Hare: Roe and Merne (2006) reported there being several animals inhabiting the rough grasslands near the golf course. The one record of the species from the NBDC website is from the golf course (2017) and it was reported to the author that Hare are regularly seen on the course.

Grey Squirrel: This North American alien species was introduced to Ireland early in the 20th century and is spreading throughout the eastern and northern lowland parts of the country. Roe and Merne (2006) encountered it a number of times in wooded areas during the field survey period in 2006. The species has also been recorded from the golf course and the Old Golf Links Road in recent years (NBDC website).

Wood Mouse: Roe and Merne (2006) recorded Wood Mouse in August 2006. There are no records of the species for the locality on the NBDC website and it is likely to be under-recorded.

House Mouse: Reported by several local residents as common in the Blackrock area (Roe and Merne 2006). There are no records of the species for the locality on the NBDC website and it is likely to be under-recorded.

Brown Rat: There are no records of the species for the locality on the NBDC website and it is likely to be under-recorded.

Red Fox: Traces of Red Foxes (“scats”) were noted by Roe and Merne (2006), and they recorded local residents as reporting the species from time to time. Additionally recent, regular sightings of foxes were reported from the golf course. There are no records of the species within the survey area on the NBDC website but there is a record of roadkill just outside the survey area on the Dublin Road. It is likely to be under-recorded.

Irish Stoat: Two reports of the species were received from local residents (Roe and Merne 2006). There are no records of it from within the study area on the NBDC website.

American Mink: A local resident reported this introduced alien species from the Fane River. There are no records of it from within the study area on the NBDC website, with the closest record being from Knockbridge (9km west of Blackrock) in 1990.

Badger: There are no records of this species from within the study area on the NBDC website but there are recent records of roadkill from along the Dublin road to the west.

European Otter: There is a record from 2017 on the NBDC website of an Otter at Blackrock Beach. There is also a record of roadkill from near the Fane River Bridge (2012).

Bats: Common pipistrelle and Leisler's bat were recorded from Hamilton Marsh in 2010 by Tina Aughney (Aughney 2010). A survey by Faith Wilson reported on by Roe and Merne (2006) and recorded on the NBDC website recorded Daubenton's Bat, Soprano Pipistrelle, Brown Long-eared Bat as well as Common Pipistrelle. There is a further record from 2006 recorded by Faith Wilson for Lesser Noctule on the NBDC website.

Part 2 Biodiversity Enhancement

5. Actions

Following consideration of the desk study and viewing the sites on the ground a series of actions which can be undertaken to enhance the biodiversity of Blackrock are presented in the following section. These are intended as a guide of potential projects and targets which might be introduced. These are summarised in the table below together with a proposed timeline for when it might be feasible/desirable for these to be carried out. Though this may appear a long list at first glance, a number of the actions are currently being undertaken and it would be a continuation of on-going work. Additionally some of the suggestions may be considered aspirational or unsuited to the locality.

Action	Timing	Notes
Beach clean up	On-going Annual	
Coastwatch Recording	On-going Annual	Aim to have additional sections of coast surveyed
'Take 3 for the Sea'	Medium-term	Identify sponsorship or other sources of funding
Dundalk Bay surveillance	On-going	Reporting to NPWS
Continued maintenance and educational role of Blackrock Park	On-going	
Biodiversity talks/walks	Medium-term / Annual	Support from the Heritage Council and Louth Co. Council
Consider daylighting of Blackrock Park stream or enhancing ecological value of the watercourse	Long-term	Would require involvement of Louth Co. Council, Inland fisheries and engineers experienced in riverine enhancement
Adding hedgehog ramps to Blackrock Park stream	Short-term	
Biodiversity recording	Annual	Establish initial targets and revise these on an annual basis
Record and map non-native species	Medium-term	
Continue to implement All-Ireland Pollinator Plan actions	On-going	
Petition Louth Co. Council to establish pollinator-friendly landscaping zones for new developments	Short-term	
Establish a Dispersed Urban Orchard	Long-term	
Investigate the local Swift population and the potential for siting swift nest boxes in the locality.	Medium-term	
Establish Swallow and House Martin nest boxes	Medium-term	
Establish additional bat boxes in the locality	Medium-term	
Consider making enhancements for Hedgehogs	Medium-term	
Encourage implementation of pollinator- and wildlife-friendly management at Dundalk Golf Club	Medium-term	
Remove bramble and ash from Hamilton Marsh	Short-term	
Remove dogwood from Hamilton Marsh	Short-term	
Manage bramble and gorse at Fane View	5-year frequency	

Consider removal of Winter Heliotrope at Fane View	Medium-term	
Address dumping of garden waste	Medium-term	
Construct an otter ledge on the River Fane road bridge	Medium-term	Would require involvement of Louth County Council
Install nest box for Dipper on River Fane road bridge	Medium-term	Would require involvement of Louth County Council
Protecting and enhancing wildlife corridors	Medium-term	
Wildlife gardening by residents	On-going	
Review of the Biodiversity Enhancement Plan	Long-term	

5.1. Dundalk Bay

The designated areas of Dundalk Bay SAC/SPA are largely below the high-water mark and as such are under the ownership of the State rather than in private ownership. There is a legal requirement for the State to maintain, or restore as appropriate, the habitats and birds that are the qualifying interests of these sites to favourable conservation condition. Blackrock Tidy Towns already play an important role in the practical management of the coastal areas by being part of An Taisce's Clean Coasts initiative www.cleancoasts.org with the annual clean-up of Blackrock Beach and other coastal areas. This could be taken a step further by asking people to act on this every time they go to the beach rather than looking on this as part of an annual clean-up. The sign above is erected at Spanish Point and Miltown Malbay in Co. Clare as part of the Take 3 for the Sea initiative (www.take3.org).

Additionally information on the condition of the coast is collected by Blackrock tidy towns annually through the Coastwatch initiative (coastwatch.org/Europe/).

Contribution to this international citizen science survey could be enhanced with more people involved and more sections of the coast in the Blackrock area being surveyed in future years.

It is also important to maintain regular surveillance of the coastal environment and to report any potential threats to National Parks and Wildlife Service or Louth County Council. This could include dumping of waste or digging, driving vehicles over the area, faulty septic tanks or repeated disturbance of birds. Ruddy Duck (*Oxyura jamaicensis*) is an invasive species of bird which has been recorded from the vicinity of Dundalk Bay. The Ruddy Duck is unusual in that the negative impact it has is not to biodiversity in Ireland but overseas. It is the most serious threat to the survival of the globally threatened White-headed Duck (*Oxyura leucocephala*), which occurs in Spain, with which it hybridises. Any occurrence of Ruddy Duck should be reported to National Parks and Wildlife Service.

5.2. Blackrock Park

The work conducted by all those involved in the creation and development of Blackrock Park is to be commended. With its location adjoining the Community Centre and multiple entrances, it makes the area a real hub of activity for the community. The different gardens around the edges provide everything that could be asked of a community garden, providing space for environmental education, information, gardening, composting, provision for pollinators, sports, play and community involvement. From an ecological viewpoint it does not seem possible to improve upon what has already been achieved. Also from an educational viewpoint, the improved awareness of environmental issues through the signage and work carried out here must not be under-estimated. The environmental-education role could be further enhanced through holding biodiversity talks. These could focus on any aspect of local ecology, present aspects of local biodiversity recording techniques or have a broader view of international ecology. This could be carried out as part of Heritage Week.

One physical area within Blackrock Park which could be enhanced is the stream which flows along the eastern side of the Park. The stream flows within a precast concrete, open culvert or chute, so lacks natural structure. It is approximately 150cm wide, with the sides approximately 100cm high. The base of the stream is concrete with accumulated sediment in places and in the southern section some small stones on the base generate a slight riffle effect. In the south, Fool's Water-cress grows and it can also be found in the short upstream section north of the Park before it becomes fully culverted. Upstream of the footbridge which links the Park to the Community Centre a wooden dam (approximately 30cm high) has been installed to create a waterfall. This generates a pleasing sound for people as they cross over the bridge in addition to oxygenating the water. There is, however, some concern that the dam acts as a barrier to the movement of aquatic life up the stream. The dam also has the effect of holding water upstream with an accumulation of sediment. The depth of the water in the middle section may also prevent colonisation with aquatic vegetation. Tadpoles were seen in the stream in April 2019 and there are reports of Eel being seen, in addition to a potential sighting of an Otter.

The value of the stream has been limited by the concrete chute as places where invertebrates and fish can shelter are limited by the smooth concrete substrate. During heavy rainfall any accumulated gravels are likely to be washed from the system, removing these habitat niches. The ideal scenario would be for a dedicated study to be conducted which considers the potential for taking the stream out of the existing concrete constraints and reintroducing a more natural flow and bed with cobbles and gravels, and allowing access to the streamside. This process has become known as 'daylighting waterways' as many have been fully culverted. The process here in the Park would be the same. Access to the stream by the community could be incorporated through a stepped bank which would contain any high flow but allow pedestrian access and connectivity with the watercourse. Works could potentially extend from Rock Road through to the southeastern corner of Blackrock Park, though the potential for impacts on the landscaping of the park would need to be considered. This would be a significant engineering project requiring the involvement of Louth County Council, the Local Authorities Water Programme (LAWPRO) Inland Fisheries Ireland and engineers experienced in designing riverine enhancement programmes.

A smaller-scale approach could entail adding some in-stream boulders and stones to enhance the structure and variety within the stream. Gravels and stones could be added to the base and low berms to the sides to create a more natural hydrology. This would generate some limited improvement both to the appearance and the ecology of the channel. The concrete bottom of the channel would remain a major limiting factor to the ecology of the stream. Again this would need involvement of expertise to ensure this is a sustainable and feasible process together with consultation with Louth County Council and Inland Fisheries Ireland and a suitably qualified and experienced aquatic ecologist.

Due to the steep sides of the concrete chute Hedgehogs have been found on occasion drowned in the stream. Though Hedgehogs are able to swim for short periods, without easy egress points they will eventually succumb to the cold and fatigue. Wooden ramps can be added to the side of culverts to allow Hedgehogs to climb out of the stream. Locations should be selected at which a trapped Hedgehog is likely to be forced by the movement of the stream. Examples can be found at www.Ecosapien.org. and

www.wildlifebilly.blogspot.com/2015/06/. Undoubtedly the ramp would be used by frogs, particularly small frogs leaving the stream. If the ramp had edges and no gaps or steps this would facilitate its use by frogs, bearing in mind they may be no larger than a 2 euro coin. As well as providing a low-cost, practical means to assist wildlife it has the added benefit of being a novel, visual indicator of the work being done and would stimulate interest within the community.

5.3. Biodiversity recording

As a measure of the biodiversity recording and the level of engagement with citizen science by local residents, a search of records entered on the NBDC for the study area was conducted. A total of 110 different species have been recorded within the study area and entered on the NBDC website. This is a total of 344 records (as of the 7th January 2019). These records are presented in Appendix 1. One way of engaging with the natural environment is by observing and identifying species and then entering these records on the NBDC website. The level of engagement can be measured, to a degree, through the number of records made. Together with an awareness campaign of Citizen Science and the NBDC portal, targets could be set for the number of records made within the study area to be increased through community effort. Using the townland of Haggardstown as the spatial reference area would provide a repeatable area to check on future numbers. Realistic targets may be to increase the number of records for the townland by 50% and number of species recorded by 20% within 2 years. Some groups such as butterflies, bees and terrestrial mammals seem to be well-represented within the local records but there are significant numbers of flowering plants, seaweeds and ferns which are relatively easy to identify that could be added to the dataset. Great places to start would be the pond-dipping in some of the stony sections of the stream in Blackrock Park and a rock pool study to identify as many marine species as can be found.

5.4. Invasive species

Invasive species are an issue across many parts of Ireland. A first step to addressing the issue is identifying which species are a concern and there is a great deal of information to assist with this on www.invasivespeciesireland.com. Thankfully there do not appear to be any major concerns in the Blackrock area, though there are records of Japanese Knotweed from Main Street (on NBDC website 2017), and just outside the study area at the crossroads near the Crowne Plaza (2017). This is a species for which particular vigilance is required. Removal of this should only be attempted by specialist contractors.

Winter Heliotrope was recorded near the River Fane at Fane View (see photo on the above left) and there are extensive patches south of Coast Road opposite the entrance to Ard Shee (see photo right on the next page). This plant spreads by the growth of its roots and it dominates areas with native species being pushed out. Though it does provide a source of winter feeding for bees, its value here is outweighed by its invasive

qualities. It is extremely persistent, being able to regenerate from small parts of the roots. Continued digging of it will, however, eventually exhaust the plant. As the plants at the River Fane are in fairly discrete patches this approach may be feasible here. Those near Coast Road are more extensive and as they occur within the Dundalk Bay designated areas, involvement of NPWS would be required before any attempt at removing these plants.

A number of Spanish Bluebell plants were also noted through the survey area, these are both in roadside planting areas and in natural areas such as the River Fane and along the shoreline of Dundalk Bay. These non-native plants are a concern as they hybridise with native bluebells. Additionally Three-cornered Leek occurs along the Coast Road (pictured below), another invasive species, the seeds of which are distributed by ants.

A long-term aim could be set for there being no non-native plants occurring in natural areas within Blackrock, though a more realistic aim might be ensuring there is no spread of such plants. An initial step toward either target is identifying and recording non-native species in the locality and feeding these into relevant national or county-level strategies.

5.5. All-Ireland Pollinator Plan 2015-2020

As stated on the All-Ireland Pollinator Plan website (www.pollinators.ie) one third of our bee species are threatened with extinction from Ireland because we have drastically reduced the amount of food (flowers) and safe nesting sites in our landscape. The All-Ireland Pollinator Plan 2015-2020 provides a wealth of practical information for farmers, County Councils, businesses, gardeners and community groups to improve the areas they manage for wildlife and to create areas where pollinators can survive and thrive. In particular the communities' webpage (http://pollinators.ie/communities/) provides case studies and guidelines dedicated to groups such as Tidy Towns groups. The guidelines for communities (NBDC 2015) provide 24 low-cost actions to enhance community areas for bees, the

first of which is to identify and protect existing sources of food and shelter.

It must be recognised that many of these actions have been incorporated into the programme of the Blackrock Tidy Towns as exemplified by the work at Blackrock Park. The challenge now would be not only to maintain the good work and improvements which have been made but to extend this approach to additional areas and to encourage their adoption by the community within their own gardens and those responsible for managing open areas through the town.

There is also provision to record actions on the website such that pollinator-friendly actions across the country are recorded and the development of these can be tracked (see https://pollinators.ie/record-your-actions/)

An additional area where the actions of the All-Ireland Pollinator Plan can be incorporated is through new housing developments within the locality. It is becoming standard practice for landscape architects in Ireland to include pollinator-friendly planting regimes as significant components (> 80%) of the landscaping of new housing and industrial developments. Louth County Council can be petitioned to have these standards brought into any new developments and also as a set requirement in the next development plan.

5.6. Dispersed Urban Orchard

The Dispersed Urban Orchard is an idea implemented in Monaghan Town by the Monaghan Tidy Towns. Trees were sourced from Irish Seed Savers and sold for a nominal fee to people of the local community who planted them in their own gardens and estates. In addition to providing an early source of pollen for bees and other pollinators, the main benefit of this approach is that it involves the local community, giving shared ownership of the 'orchard' to the community. Unlike a traditional orchard it does not require land to be given over to establishment, and maintenance will be with the owners of the trees. Blackrock already has an orchard established within Blackrock Park and the Dispersed Urban Orchard will build on this. Mapping of the locations of the trees on the pollinator webpage could be set as a requirement of involvement in the programme, this in itself generating engagement of the community with the All-Ireland Pollinator programme.

5.7. Enhancements for wildlife

There are various species for which habitat could be enhanced within the Blackrock area. Birds have specific requirements depending on their habits and size, so research on the specific requirements for a species is important before embarking on erecting nest boxes. Also in general nest boxes require cleaning out annually so it is a long-term commitment. The Swift is a species which is in decline but can be aided by erecting nest boxes. There are details on www.swiftconservationireland.ie including carrying out initial surveys, siting of boxes and how to attract birds to the boxes through recordings of swift calls.

The nest boxes for Swallow and House Martin (see photo) are available from Birdwatch Ireland. These boxes are quite different to traditional bird boxes and would provide a good visual indication of the bird diversity so ideally would be positioned in prominent locations. Similarly bat boxes can be installed and these can be easily made from timber. Designs for bat boxes can be found at www.batconservation.org. Bat boxes will also need cleaning out once a year.

Hedgehog highways are a good measure for raising biodiversity awareness and participation of the community. These are simply holes cut into the bottom of fences to allow movement of Hedgehogs from one garden to the next. Details of how the size required can be found at www.hedgehogstreet.org/ and the picture given is from that website. This is a project that requires neighbours to work together and the more neighbours who are involved the more effective the highway will be. Similarly Hedgehog boxes can be established in gardens. There are lots of designs for houses available online and some links are included at the back of this document.

5.8. Blackrock Golf Course

The golf course comprises the largest and most diverse area of terrestrial habitat within the study area.The primary function of the golf course is obviously for the playing of golf with any wildlife benefits being additional to this. If ecological enhancements could be made within what is a large area of mixed habitats there would be benefits to wildlife in the broader area.

The National Biodiversity Data Centre has produced a new guide for golf courses: *Pollinator-friendly management of Golf Courses* (NBDC 2019). This booklet recognises the vital role golf courses can play if they are managed in a pollinator-friendly way. It sets realistic, science-based actions for a club such as the Dundalk Golf Club which can be incorporated into the management regime.

It is a requirement of the ground staff to ensure play is not slowed greatly by impediments such as tall vegetation while maintaining a challenging course to play. As such the greens and fairways have low ecological value, reflecting the relatively high-intensity management. Indeed even much of the rough area is kept relatively short such that balls can be readily located. There are, however, areas of taller grasses, bramble and gorse scrub and in some areas dense woodland. These would provide refuge, foraging areas and flight paths for birds, insects and mammals. The on-

site water features add character to the course, are appealing to users, assist with on-site water management and also provide valuable habitat for a range of flora and fauna. Though artificial, they do provide open freshwater habitat, which is a relatively uncommon habitat niche in the study area. Moorhen with young birds were seen at the pond in the south of the course. The value of a pond to wildlife can be greatly enhanced by ensuring birds and small animals can access the water easily. A natural edge of reeds and sedges allows such access while steep steps or artificial edges preclude this. There are sections of natural edge to the large pond in the south of the course and the one backing onto the woodland in the western centre of the course. A recently renovated pond in the north of the course (see photo right) has sleepers forming the edge for much of the perimeter and a concrete kerb for much of the remainder. The section in the north near the outflow of the pond does, however, provide some opportunity for enhancement and the grading of this to encourage the development of some fringing wetland vegetation would improve the wildlife value of the feature. Connecting this to the rough beneath the trees, by allowing taller grasses to develop, would further enhance the area.

Some further guidelines which could be applied at Dundalk Golf Club are given below:

- Create and maintain additional areas of undisturbed grassland. These should only be cut on a two or three-year cycle. A minimum area of 10m^2 is desirable, preferably adjacent to a hedge or treeline. Cutting should take place in late summer with clippings removed to prevent the build-up of nutrients, which encourages the dominance of coarse grasses.
- Connect natural areas as much as possible to improve wildlife movement throughout the golf course.
- Retain areas of scrub. Scrub habitat provides both shelter and food for invertebrates, birds and mammals. Some scrub species can provide food in the form of both nectar and berries. If allowed to become dominant, scrub can overwhelm grassland and its associated species. A combination of patches and scattered individual bushes is ideal (e.g. Hawthorn (Whitethorn), Blackthorn, Gorse (Whins or Furze), Bramble and native Grey Willow).
- Retain taller grasses around trees and scrub wherever possible. This benefits invertebrates that need trees /scrub to feed and grasses to pupate (i.e. to complete life cycles).
- Practice good chemicals management. Eliminate potential chemical runoff and drift near water bodies by designating “no spray” zones, using spot treatments, increasing thresholds for pest problems, and taking the weather into account prior to application (avoiding windy days or days when rain is forecast soon after application).

- Maintain and clean maintenance equipment in a manner that eliminates the potential for on-site or off-site contamination of water bodies. Mix and load chemicals in an area that guarantees spill containment.
- Flowerbeds within the grounds of the golf course, including the car parking area and around the clubhouse, should be planted with pollinator-friendly plants. Flowerbeds areas should be pesticide-free zones.
- Promote and retain structural diversity of woodlands. Woodlands with ground flora, dead wood and an understorey will provide significantly more habitat than a manicured even-aged stand of trees.
- Dense conifer plantations cast excessive shade, limiting understorey and field layer growth. Thinning allows individual trees to strengthen and become more wind resistant; thinning will also diversify the understorey.
- Retain both standing and fallen dead wood. This will promote associated fungi, invertebrates, hole-nesting birds and bats. Any wind-thrown trees within the woodland should be left *in situ*. Trees along paths or near areas of play should be assessed for damaged or decaying limbs as these may pose a health and safety risk.
- Any fallen trees that need to be sawn up and moved should be made into small log piles (<0.75m high) to promote dead wood invertebrates and fungi. Finer branches and limbs can be stacked in windrows with some left intact on the woodland floor.
- Retain scrub along margins of the woodland. Scrub should be retained at the woodland's edge as this creates a more natural habitat transition, a situation preferred by many birds. This should then ideally transition to rough grass or meadow habitat.

It is appreciated some of these measures are currently undertaken through the management of the golf course and the intention here is to emphasise the ecological benefits of these measures and to encourage their further application.

5.9. Hamilton Marsh

The value of Hamilton Marsh is as an open area of wetland habitat. It is a small diverse area with wet grassland, ditches, swamp and dry grassland areas, and maintaining the biodiversity value of the site will require on-going management. There is an issue with Bramble and Ash encroachment through the central section of the site (see photo to the left). These

should be removed, ideally though digging up the roots. This will be easier for the Bramble than for the Ash. The digging up of roots will cause some local disturbance and this should be kept to a minimum by filling in holes created. However, some small holes and bare soil will create niches for plants and invertebrates. The removal of this scrub should be undertaken before plants become more extensive.

Areas of Bramble on the eastern ditch and in the southeastern corner should be contained such that they do not become too extensive. Indeed the Bramble on the eastern boundary could be removed to maintain a more open structure to the Marsh, retain views across the area and as a visual indication of management being undertaken. Removal of large clumps of bramble should be done outside of the bird-breeding period (March to August inclusive) to avoid accidental damage to nesting birds.

Another cause for concern is the dogwood which has invaded the western side of the Marsh. This is not mentioned in the Convery (2009) report and appears likely to have been introduced since then, quite likely through the dumping of garden waste. The extent of it can be seen in the centre of the image above right. The dogwood should be cut back as soon as possible. It will be important that plant material is removed from the wetland area to ensure the shrub is not inadvertently spread to other sections of the Marsh. Spot treatment of the stump with a herbicide will then be required. Dogwood plants are persistent and follow-up treatment will be necessary. Careful use of chemicals will be necessary and it may be necessary to bring in experts in the removal and treatment of invasive species to assist with this task.

As suggested by Convery (2009) the Marsh would benefit from an annual mowing (strimming) regime. This would entail the clippings being removed such that nutrient levels are kept low. If annual mowing is likely to be too onerous a task it could be done on a two or three-year cycle. If no mowing is conducted it is likely to dry out further through the continual accumulation of biomass (dead vegetation). Within the Marsh there are a number of tall tussocks of grasses and bryophytes. These provide drier habitat niches for plants and refuge for invertebrates during flood events. Tussocks such as these take some time to form and impacts on these during any management should be avoided. As such no cutting or trampling of the tussocks should occur. These tend to occur in the south of the site away from the encroaching bramble and ash. Other areas to avoid are the very wet areas in the ditches and in the southern section of the

site where the Yellow Flag Iris occurs. This is a health and safety concern in addition to the need to avoid these more sensitive sections.

5.10. Dumping of garden waste

There is an issue with dumping of grass clippings and garden waste in various locations around the study area, no more so than in any other similar town in Ireland, but nonetheless a cause for concern. Locations where this was noted include at Fane View, Hamilton Marsh and along the shoreline. Though biodegradable, garden waste can attract dumping of additional items which do not degrade, such as household waste. It can also result in the release of non-native plants into wild areas (e.g. Spanish Bluebell, Japanese Knotweed, Winter Heliotrope or Dogwood). These escapees are then able to colonise areas to the exclusion of native species. They also create nutrient pools which encourage the growth of vigorous plants such as nettle and rank grasses, again to the exclusion of other plants. This is an additional concern when close to rivers and streams as the nutrients can enter these, contributing to water pollution issues. Also, from a visual perspective, dumping of garden waste is rather unsightly in a natural area.

Part of the approach to this is one of education and the compost demonstration areas in Blackrock Park are exemplary in this. It may also be necessary to speak to people carrying out the dumping, explaining the concerns. Small-scale garden composting should be encouraged and there may also be scope for providing additional composting areas around the town for people to utilise.

5.11. River Fane

It is noted in the Water Framework Directive Cycle 2 report for the River Fane (www.catchments.ie accessed 11 July 2019) that there is no significant issue with this water course. At Fane View there is a pathway which affords good views of the lower reaches of the River. The bank here is steep and there is a low chain-link fence which, though impeding a sense of connectivity with the river, does provide safety and does not compromise the views. The area between the fence and the river is steep and is managed as a wildlife area. Though this low-level maintenance is suitable

for this area it would be desirable to conduct infrequent management of the Bramble and Gorse scrub such that it does not dominate the area, becoming a visual and effective barrier. Patches of Bramble and Gorse will provide nesting areas and food sources for birds and insects but the aim should be that these do not cover more than 10-15% of the area such that the connectivity of people with the river is retained together with areas for less robust plants. Other issues here include the occurrence of the non-native plant species Winter Heliotrope.

A further measure which could be conducted at the River Fane road bridge is the insertion of an otter ledge. Rather than swimming along rivers, which takes a significant amount of energy, otters tend to walk along rivers, entering them only when they wish to hunt. When they encounter a road bridge they will walk onto the carriageway and cross the road. Otter paths were seen during fieldwork for this project where Otter had climbed up the bank and crossed the road. This can lead to collisions with cars as recorded from the River Fane road bridge in 2012. A ledge made of metal or wood and bolted onto the sides of the bridge can be added providing a safer route for Otter. An example from Gwent Wildlife Trust of provision made for an otter to pass beneath the road can be seen in the photo above. Additional specifications for the design of these can be found in *Guidelines for the treatment of otters prior to the construction of national road schemes* (NRA 2008) and it is likely fencing would be required to prevent Otter from accessing the carriageway. This work would need to be conducted with the permission of Louth County Council, but the construction of the ledge would provide a valuable point of interest for local residents, generating interest in the River Fane and also one of the more secretive but charismatic members of the local wildlife.

A further enhancement associated with the River Fane road bridge would be erecting a nest box suitable for dippers. There are records of this species from the locality and it would be prudent to check that the area is not already used as a nesting site. This can be done in the spring by observing any movement of birds in the locality. Nest boxes can be purchased from Birdwatch Ireland and Duhallow Life contains images of home-made nest boxes and details on where to position them. Nest boxes would require cleaning out each year in October.

5.12. Enhancing and protecting wildlife corridors

In preparing this report a schematic overview of wildlife corridors within the study area was conducted and these are indicated in Figure 4. The shoreline/coast forms a natural corridor along the eastern side, from the saltmarsh areas around The Loakers through to the Fane Estuary and the River Fane. This continues further along the coast both to the north and

south. By its nature the coast is rather exposed and is fragmented by the Blackrock village centre. The mudflat areas, the coastal strip and the sea itself do, however, facilitate the movement of wildlife, especially birds and marine life, through this section. The River Fane itself then forms a significant corridor extending to the west. There are two main streams, at least partially within the study area. The stream which runs through Blackrock Park forms the main wildlife corridor through the town providing a discontinuous link from north of the golf course with the Fane Estuary. Though there is culverting in places the remaining open sections provide stepping-stones of habitat. The course of these streams should be reinforced and enhanced and any further culverting of streams should be avoided. Small streams should be given space to develop streamside vegetation and areas where flooding can occur and can be reinforced with suitable planting of such native trees as Grey Willow and Alder. Additional proposals for the section of stream through Blackrock Park are given in Section 5.2.

As noted earlier the golf course provides the main area of terrestrial semi-natural habitat in the locality with the hedges and treelines on the course forming natural wildlife corridors. The existing habitat links to the golf course area should be retained where possible. One extends from the Fairways Hotel area across the Old Golf Links Road toward the western side of the golf course. Maintaining a corridor from the open space area identified south of the Fairways to the golf course should be incorporated into the role of the landscape architect for developments in this area. The hedgerow extending from the a point south of the club house of the Golf Club in a southeasterly direction to Rock Road and almost to Hamilton Marsh.

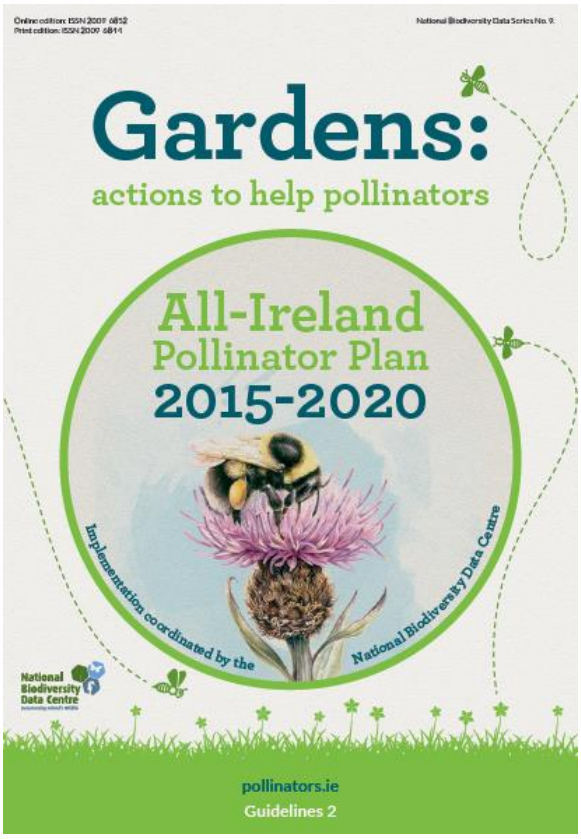
Ideally existing hedgerows should be incorporated into future development projects and enhanced through sympathetic native planting. A hedgerow which should be retained and developed as a wildlife corridor is to the northeast of the club house, running in a northwest – southeast direction from Bothar Maol to Birch's Lane.

Additional survey work specific to the role of wildlife corridors might indicate what animals are using them, or could use them, and how they might be enhanced to improve the permeability of areas for wildlife. In a built-up landscape existing wildlife corridors are often non-contiguous but it is a question of identifying what is there and improving the quality of these and, where possible improving linkages between them.

5.13. Wildlife gardening

There is a wealth of advice that can be applied to any garden, no matter what size in the Gardens advice provided by www.pollinators.ie/gardens/. These simple, practical actions will help to improve the wildlife value of gardens for pollinators. Actions include pollinator friendly window boxes, hanging baskets and potted herbs, through to modifying lawn-mowing regimes. The guide even includes a guide for estates managers that can be given to companies who manage green areas or housing development grounds to encourage them to adopt pollinator friendly practices. Encouragement is given in the guide to recording pollinator friendly gardens on the publicly available mapping system such that pollinator friendly actions being carried out across Ireland can be tracked.

In addition many of the proposals given in the Plan can be applied on an individual basis. Bird boxes and bat boxes can be erected by individuals in their gardens, hedgehog highways and hedgehog houses can be provided. Apple trees can be planted on an individual basis which will contribute to the Dispersed Urban Orchard. Becoming involved in biodiversity recording simply involves seeing something in nature and inputting it in the national database. As such the biodiversity enhancement of Blackrock is something all residents can contribute to.



5.14. Review of the Biodiversity Enhancement Plan

It is evident from the work that has been conducted to date around the community that the Blackrock Tidy Towns is eminently capable, informed and organised. Even so, it is not expected that all of the actions suggested here will be enacted. A review of the proposals would be of great benefit to update the actions and further develop proposals. A timeframe of around five years is likely to be suitable. A review of the actions will highlight the successes of the plan and it will be possible to build on these through future actions. It may be found through the lifetime of this plan that some of the actions were unfeasible or unsuited to the community and have not been enacted, or some have been enacted but not as successfully as would have been hoped. The review process will assist in the adaptation and development of these measures, together with the development of new proposals for the community to work towards.

References

Aquafact (2009) Study of Blackrock Beach County Louth. A Report to Blackrock Tidy Towns.

Aughney, T. (2010) Bat survey at Hamilton Marsh, Blackrock. A Report to Blackrock Tidy Towns.

Convery, S. (2009) Biodiversity Action Plan for Blackrock, including Hamilton Marsh. A report to Louth County Council and Blackrock Tidy Towns.

Crowe, O. 2005. *Ireland's Wetlands and their Waterbirds: Status and Distribution*. BirdWatch Ireland, Newcastle, Co. Wicklow.

Duhallow Life (2015) Provision of nesting boxes for Dippers *Cinclus hibernicus* – Monitoring Report. IRD Duhallow report.

Foss, P., Crushell, P., O'Loughlin, B. and Wilson, F. (2012) County Louth Wetland Survey II. Report prepared for Louth County Council & The Heritage Council.

Foss, P., Crushell, P., O'Loughlin, B. and Wilson, F. (2012) County Louth Wetland Survey I. Report prepared for Louth County Council & The Heritage Council.

Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Ireland.

Hayden, T., Harrington, R. 2000. *Exploring Irish Mammals*. Town House, Dublin.

Louth County Council (LCC 2015) Louth County Development Plan 2015-2021. Louth County Council.

Martin, B. (2010) Birds of Hamilton Wetland, Blackrock, County Louth. A Report to Blackrock Tidy Towns.

McCorry, M. and Ryle, T. (2009) Saltmarsh Monitoring Project 2007-2008, Volume 3 Final Report. A report to National Parks and Wildlife Service.

Mitchell, A. 1974. *A Field Guide to the Trees of Britain and Northern Europe*. Collins, London

National Biodiversity Data Centre (2015) Local Communities :actions to help pollinators. All Ireland Pollinator Plan, Guidelines 1. National Biodiversity Data Centre Series No. 18, Waterford.

National Biodiversity Data Centre (2019) Pollinator-friendly management of: Golf Courses. All Ireland Pollinator Plan, Guidelines 8. National Biodiversity Data Centre Series No. 18, Waterford.

Roe, J. and Merne, O. (2006) The Ecology of Blackrock. An Ecological Survey of Blackrock, Co. Louth. A report for Blackrock Tidy Towns.

National Parks and Wildlife Service (2011) Dundalk Bay Special Protection Area (site code 4026) Version 1, Conservation Objectives Supporting Document. National Parks and Wildlife Service, Dublin.

National Roads Authority (2008) Guidelines for the treatment of otters prior to the construction of National Road Schemes. National Roads Authority Dublin.

Wernham, C., Toms, M., Marchant, J., Clark, J., Siriwardena, G., Baillie, S. 2002. *The Migration Atlas – Movements of the Birds of Britain and Ireland.* T&AD Poyser, London.

Useful websites

A host of invaluable information on promoting pollinator-friendly practices for community groups, gardeners, golf course managers and farmers is available at:

http://pollinators.ie

Maps of biodiversity records across Ireland, from National Biodiversity Data Centre: https://maps.biodiversityireland.ie/Map

Submitting biodiversity records to the National Biodiversity Data Centre:https://records.biodiversityireland.ie/

Report on the River Fane catchment https://www.catchments.ie/wp-content/files/subcatchmentassessments/06_13%20FANE_SC_020%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf

Details for the construction of an otter ledge:https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf

Video on 'How to Make a Hedgehog Ramp' and many other simple wildlife projects: www.Ecosapien.org/videos

Article on daylighting of waterways: https://www.theguardian.com/cities/2017/aug/29/river-runs-global-movement-daylight-urban-rivers

Details of the Dispersed Urban Orchard and other biodiversity projects carried out by Monaghan Tidy Towns:

https://www.monaghantownbiodiversity.com/the-dispersed-urban-orchard.html

Information from NPWS specific to Dundalk Bay SAC and SPA: https://www.npws.ie/protected-sites/sac/000455 and https://www.npws.ie/protected-sites/spa/004026.

Information on river basin management and local Local Authorities Water Programme contacts:

http://watersandcommunities.ie/

Inland Fisheries Ireland, helpful advice for any inland aquatic issues:

https://www.fisheriesireland.ie/

NPWS site report for Dundalk Bay with information specific to the saltmarshes to the north and south of Blackrock Village:
https://www.npws.ie/sites/default/files/publications/pdf/McCorry_&_Ryle_2009_Saltmarsh_survey_V3.pdf.

A web viewer showing the areas covered by the various conservation designations:
http://webgis.npws.ie/npwsviewer/.

Images of dipper nest boxes:
https://www.duhallowlife.com/sites/default/files/C9%20Final%20Technical%20Report%20-%20Provision%20of%20nesting%20boxes%20for%20Dippers.pdf

Details of swift boxes, where to locate them and how to attract swifts:

http://www.swiftconservation.ie/

Details of hedgehog highways and how to build them:

https://www.hedgehogstreet.org/help-hedgehogs/link-your-garden/

Information on bat boxes, how to build them and where to site them:

https://www.batconservationireland.org/wp-content/uploads/2013/09/Leaflet_3_batboxes.pdf

Details on building hedgehog houses:

https://www.gardenersworld.com/how-to/diy/how-to-make-a-hedgehog-house/

https://www.wildlifetrusts.org/actions/how-build-hedgehog-home

Appendix 1: Species data for the Blackrock, Co Louth Study Area.

Generated from the NBDC website on the 2nd April 2019

Species list for a User-Defined Polygon (Within)

Quality of information

The National Biodiversity Data Centre makes every effort to ensure the quality of the information available on this website and updates the information regularly. Before relying on the information on this site, however, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes. The National Biodiversity Data Centre cannot guarantee and assumes no legal liability or responsibility for the accuracy, currency or completeness of the information.

To assist the Centre in the provision of high quality information, should you identify an error in any of the information provided, please notify the Centre and every effort will be made to rectify the error.

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
alga	Ascophyllum nodosum	1	13/05/ 1987	Seaweeds of Ireland	
amphibian	Common Frog (Rana temporaria)	1	01/06/ 2005	Irish National Frog Database	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts
bird	Barn Swallow (Hirundo rustica)	3	18/09/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Black-billed Magpie (Pica pica)	2	06/09/ 2017	Birds of Ireland	
bird	Black-headed Gull (Larus ridibundus)	1	22/07/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Blue Tit (Cyanistes caeruleus)	1	01/08/ 2017	Birds of Ireland	
bird	Common Blackbird (Turdus merula)	1	01/08/ 2017	Birds of Ireland	
bird	Common Buzzard (Buteo buteo)	1	22/07/ 2017	Birds of Ireland	
bird	Common Coot (Fulica atra)	1	22/07/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section II Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Kingfisher (Alcedo atthis)	1	23/08/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
bird	Common Moorhen (Gallinula chloropus)	1	22/07/ 2017	Birds of Ireland	
bird	Common Starling (Sturnus vulgaris)	1	01/08/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Swift (Apus apus)	4	22/07/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Collared Dove (Streptopelia decaocto)	1	06/09/ 2017	Birds of Ireland	
bird	Eurasian Sparrowhawk (Accipiter nisus)	1	29/08/ 2017	Birds of Ireland	
bird	European Robin (Erithacus rubecula)	1	05/09/ 2017	Birds of Ireland	
bird	Gavia	3	01/12/ 2016	ObServe Acoustic Surveys for Cetaceans in the Irish Atlantic Margin	
bird	Goldcrest (Regulus regulus)	2	31/10/ 2017	Birds of Ireland	
bird	Great Tit (Parus major)	2	04/09/ 2017	Birds of Ireland	
bird	Hedge Accentor (Prunella modularis)	1	05/09/ 2017	Birds of Ireland	
bird	House Martin (Delichon urbicum)	2	04/09/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Little Egret (Egretta garzetta)	1	26/06/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species
bird	Long-tailed Tit (Aegithalos caudatus)	1	31/10/ 2017	Birds of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
bird	Mallard (Anas platyrhynchos)	1	22/07/ 2017	Birds of Ireland	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Manx Shearwater (Puffinus puffinus)	1	01/12/ 2016	ObServe Acoustic Surveys for Cetaceans in the Irish Atlantic Margin	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Roseate Tern (Sterna dougallii)	1	18/06/ 2016	ObServe Acoustic Surveys for Cetaceans in the Irish Atlantic Margin	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species || Threatened Species: OSPAR Convention || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Sandwich Tern (Sterna sandvicensis)	2	18/06/ 2016	ObServe Acoustic Surveys for Cetaceans in the Irish Atlantic Margin	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Song Thrush (Turdus philomelos)	1	01/08/ 2017	Birds of Ireland	
flowering plant	Autumn Hawkbit (Leontodon autumnalis)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Common Glasswort (Salicornia europaea)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Common Saltmarsh-grass (Puccinellia maritima)	6	30/08/ 1982	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Common Scurvygrass (Cochlearia officinalis)	7	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Creeping Bent (Agrostis stolonifera)	2	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Greater Sea-spurrey (Spergularia media)	3	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Japanese Knotweed (Fallopia japonica)	1	11/05/ 2017	Online Atlas of Vascular Plants 2012-2020	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
flowering plant	Lax-flowered Sea-lavender (Limonium humile)	3	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Long-bracted Sedge (Carex extensa)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Nipplewort (Lapsana communis)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Red Fescue (Festuca rubra)	6	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Saltmarsh Rush (Juncus gerardii)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Arrowgrass (Triglochin maritimum)	8	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Aster (Aster tripolium)	11	30/08/ 1982	Species Data from the National Vegetation Database	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
flowering plant	Sea Beet (Beta vulgaris subsp. maritima)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Club-rush (Bolboschoenus maritimus)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Mayweed (Tripleurospermum maritimum)	2	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Plantain (Plantago maritima)	9	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea Radish (Raphanus raphanistrum subsp. maritimus)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Sea-milkwort (Glaux maritima)	8	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Smooth Sow-thistle (Sonchus oleraceus)	1	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Spear-leaved Orache (Atriplex prostrata)	2	30/08/ 1982	Species Data from the National Vegetation Database	
flowering plant	Thrift (Armeria maritima)	2	30/08/ 1982	Species Data from the National Vegetation Database	
insect - beetle (Coleoptera)	2-spot Ladybird (Adalia bipunctata)	2	10/05/ 2017	Ladybirds of Ireland	
insect - beetle (Coleoptera)	7-spot Ladybird (Coccinella septempunctata)	2	24/07/ 2017	Ladybirds of Ireland	
insect - butterfly	Clouded Yellow (Colias croceus)	1	27/06/ 2018	Butterflies of Ireland	
insect - butterfly	Green-veined White (Pieris napi)	4	18/05/ 2018	Butterflies of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
insect - butterfly	Holly Blue (Celastrina argiolus)	12	25/05/ 2018	Butterflies of Ireland	
insect - butterfly	Large White (Pieris brassicae)	5	30/08/ 2017	Butterflies of Ireland	
insect - butterfly	Meadow Brown (Maniola jurtina)	1	17/06/ 2016	Butterflies of Ireland	
insect - butterfly	Orange-tip (Anthocharis cardamines)	1	12/05/ 2016	Butterflies of Ireland	
insect - butterfly	Painted Lady (Vanessa cardui)	4	22/06/ 2018	Butterflies of Ireland	
insect - butterfly	Peacock (Inachis io)	4	05/09/ 2017	Butterflies of Ireland	
insect - butterfly	Red Admiral (Vanessa atalanta)	10	18/09/ 2017	Butterflies of Ireland	
insect - butterfly	Small Tortoiseshell (Aglais urticae)	9	16/04/ 2018	Butterflies of Ireland	
insect - butterfly	Small White (Pieris rapae)	8	25/05/ 2018	Butterflies of Ireland	
insect - butterfly	Speckled Wood (Pararge aegeria)	25	28/06/ 2018	Butterflies of Ireland	
insect - dragonfly (Odonata)	Common Blue Damselfly (Enallagma cyathigerum)	1	22/07/ 2017	Dragonfly Records	
insect - hymenopteran	Andrena (Hoplandrena) scotica	1	10/05/ 2016	Bees of Ireland	
insect - hymenopteran	Bombus (Bombus) lucorum	9	20/04/ 2018	Bees of Ireland	
insect - hymenopteran	Bombus (Bombus) terrestris	18	08/05/ 2018	Bees of Ireland	
insect - hymenopteran	Bombus lucorum agg.	22	22/06/ 2018	Bees of Ireland	
insect - hymenopteran	Common Carder Bee (Bombus (Thoracombus) pascuorum)	28	22/06/ 2018	Bees of Ireland	
insect - hymenopteran	Early Bumble Bee (Bombus (Pyrobombus) pratorum)	3	17/04/ 2018	Bees of Ireland	
insect - hymenopteran	Large Red Tailed Bumble Bee (Bombus (Melanobombus) lapidarius)	7	22/06/ 2018	Bees of Ireland	Threatened Species: Near threatened
insect - hymenopteran	Small Garden Bumble Bee (Bombus (Megabombus) hortorum)	4	05/07/ 2017	Bees of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
insect - moth	Beautiful Carpet (Mesoleuca albicillata)	2	25/07/ 2017	Moth Records of Ireland	
insect - moth	Cinnabar (Tyria jacobaeae)	1	10/06/ 2016	Moth Records of Ireland	
insect - moth	Ghost Moth (Hepialus humuli)	1	24/06/ 2017	Moth Records of Ireland	
insect - moth	Ruby Tiger (Phragmatobia fuliginosa)	2	03/05/ 2017	Moth Records of Ireland	
insect - moth	Shoulder Stripe (Anticlea badiata)	1	12/05/ 2012	Moths Ireland	
liverwort	Bifid Crestwort (Lophocolea bidentata)	1	11/09/ 2012	Bryophytes of Ireland	
liverwort	Endive Pellia (Pellia endiviifolia)	1	11/09/ 2012	Bryophytes of Ireland	
liverwort	Marchantia polymorpha subsp. ruderalis	1	11/09/ 2012	Bryophytes of Ireland	
marine mammal	Common Dolphin (Delphinus delphis)	2	31/10/ 2015	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
marine mammal	Common Porpoise (Phocoena phocoena)	1	03/07/ 2012	IWDG Cetacean Strandings Database	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts || Threatened Species: OSPAR Convention
millipede	Blunt-tailed Snake Millipede (Cylindroiulus punctatus)	1	31/07/ 1977	Millipedes of Ireland	
millipede	Common Flat-backed Millipede (Polydesmus angustus)	1	31/07/ 1977	Millipedes of Ireland	
mollusc	Common Otter Shell (Lutraria lutraria)	2	13/01/ 2017	Coastal and Marine Species Database	
moss	Bird's-claw Beard-moss (Barbula unguiculata)	1	11/09/ 2012	Bryophytes of Ireland	
moss	Common Pocket-moss (Fissidens taxifolius)	1	11/09/ 2012	Bryophytes of Ireland	
moss	Creeping Feather-moss (Amblystegium serpens)	1	11/09/ 2012	Bryophytes of Ireland	
moss	Cylindric Beard-moss (Didymodon	1	11/09/ 2012	Bryophytes of Ireland	

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
	insulanus)				
moss	Great Hairy Screw-moss (Syntrichia ruralis)	1	11/09/2012	Bryophytes of Ireland	
moss	Rigid Beard-moss (Didymodon rigidulus)	1	11/09/2012	Bryophytes of Ireland	
moss	Rough-stalked Feather-moss (Brachythecium rutabulum)	1	11/09/2012	Bryophytes of Ireland	
moss	Seaside Grimmia (Schistidium maritimum)	1	11/09/2012	Bryophytes of Ireland	
moss	Silver-moss (Bryum argenteum)	1	11/09/2012	Bryophytes of Ireland	
moss	Springy Turf-moss (Rhytidiadelphus squarrosus)	1	11/09/2012	Bryophytes of Ireland	
moss	Wall Screw-moss (Tortula muralis)	1	11/09/2012	Bryophytes of Ireland	
moss	Water Screw-moss (Syntrichia latifolia)	1	11/09/2012	Bryophytes of Ireland	
moss	White-tipped Bristle-moss (Orthotrichum diaphanum)	1	11/09/2012	Bryophytes of Ireland	
terrestrial mammal	Brown Long-eared Bat (Plecotus auritus)	1	11/08/2006	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Daubenton's Bat (Myotis daubentonii)	1	11/08/2006	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Eastern Grey Squirrel (Sciurus carolinensis)	4	22/07/2017	Mammals of Ireland 2016-2025	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
terrestrial mammal	European Otter (Lutra lutra)	1	13/01/2017	Mammals of Ireland 2016-2025	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts

Species group	Species name	Record count	Date of last record	Title of dataset	Designation
terrestrial mammal	European Rabbit (Oryctolagus cuniculus)	1	13/05/ 2017	Mammals of Ireland 2016-2025	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
terrestrial mammal	Irish Hare (Lepus timidus subsp. hibernicus)	1	13/05/ 2017	Mammals of Ireland 2016-2025	
terrestrial mammal	Lesser Noctule (Nyctalus leisleri)	1	11/08/ 2006	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Pipistrelle (Pipistrellus pipistrellus sensu lato)	1	11/08/ 2006	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Soprano Pipistrelle (Pipistrellus pygmaeus)	1	11/08/ 2006	National Bat Database of Ireland	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	West European Hedgehog (Erinaceus europaeus)	2	18/07/ 2017	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts

Appendix 2: Figures 1 -4

Figure 1: Survey area for Blackrock, Co. Louth

Figure 2: Dundalk Bay Special Area of Conservation and Special Protection Area at Blackrock, Co. Louth

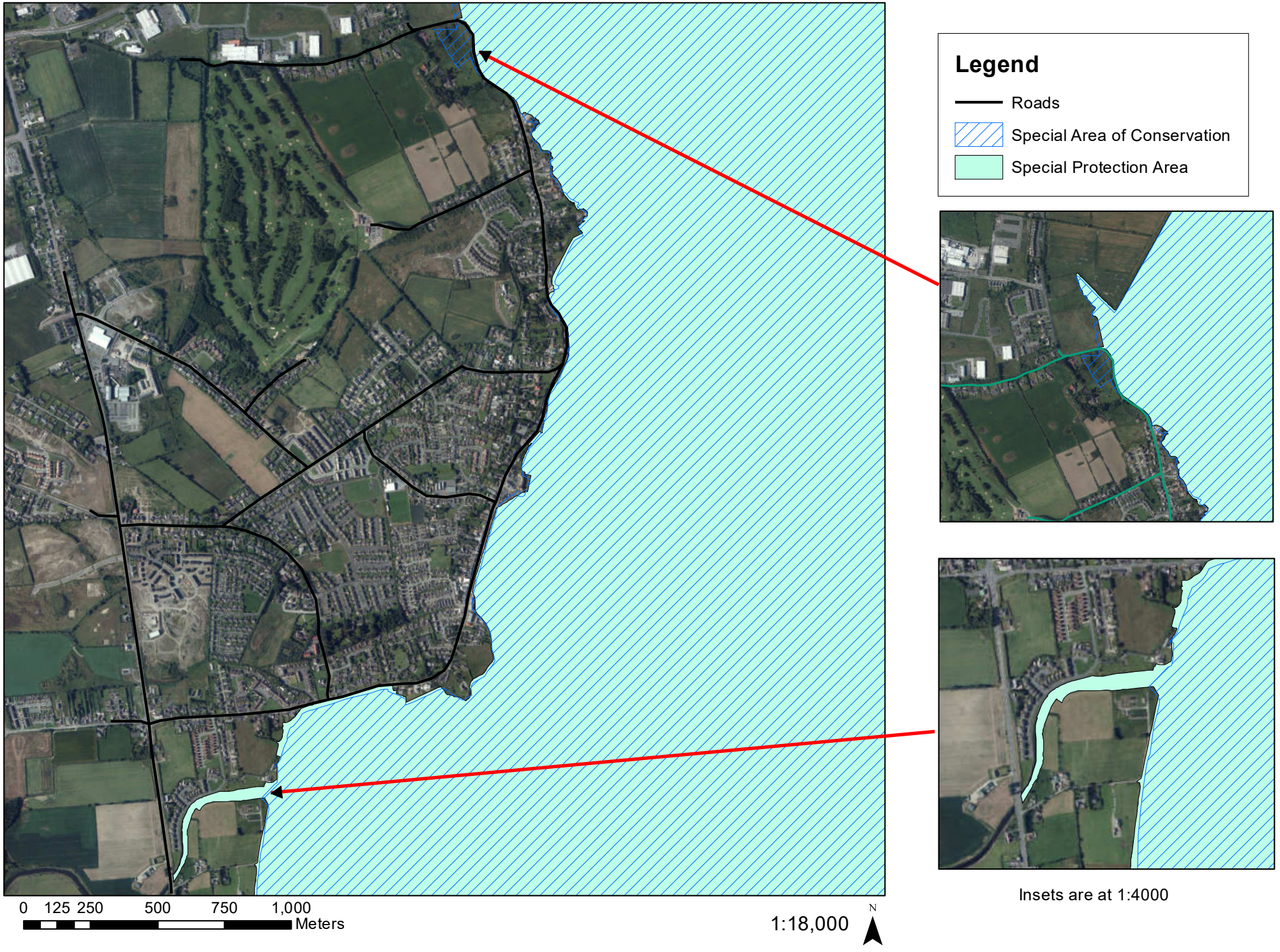
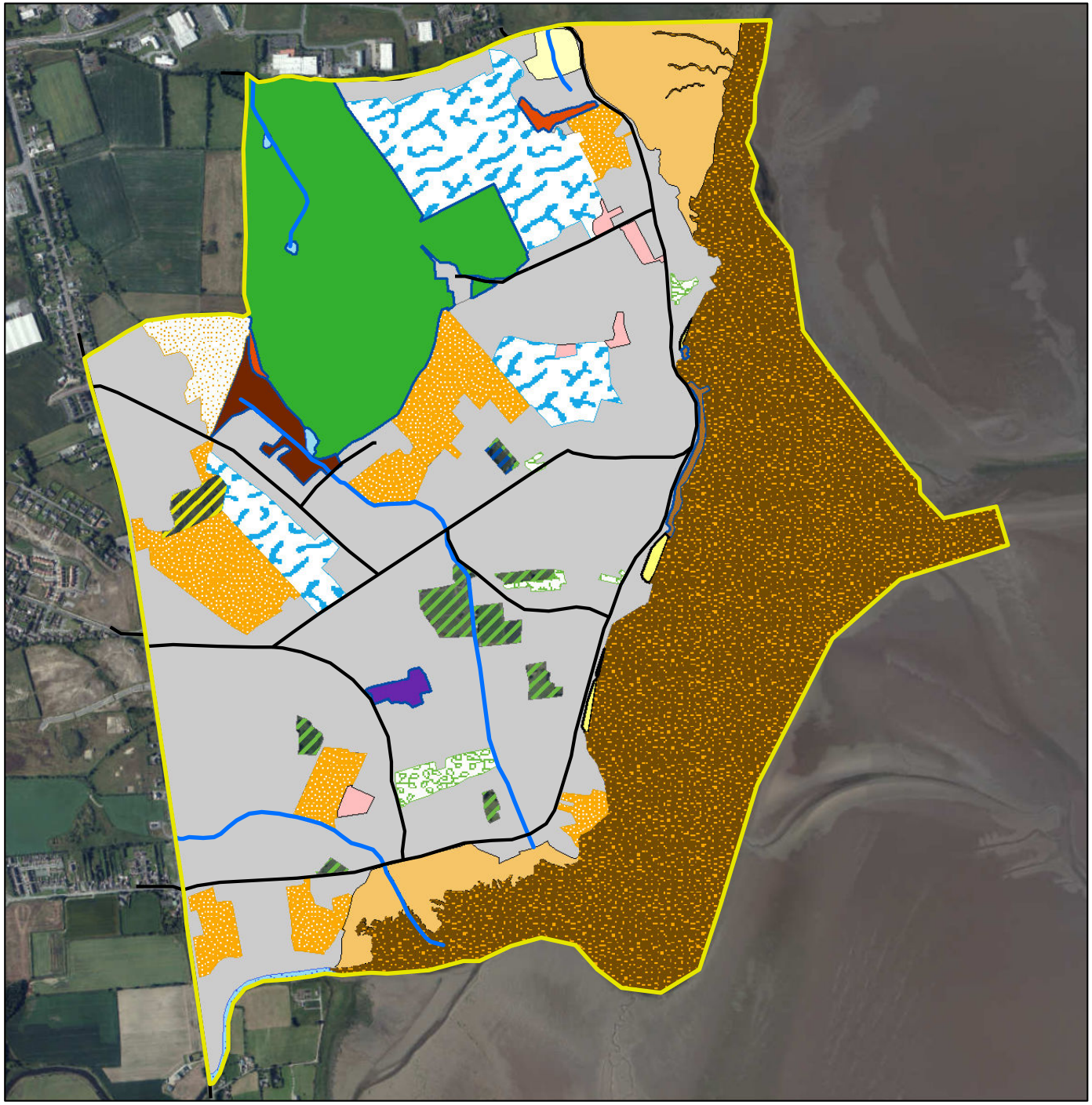


Figure 3: Habitat map for Blackrock Co. Louth



0 125 250 500 750 1,000
Meters

1:18,000

N

Legend

Roads

Streams

<all other values>

Descriptions

- Built land, gardens and hedges
- Mature trees
- Broadleaved woodland
- Conifer woodland
- Scrub
- Agricultural grassland
- Crops with hedges
- Grassland and scrub
- Grass
- Marsh
- Amenity grassland
- Golf course, with woodland and treelines
- Open space / grassland
- Open space / marsh
- Open space / scrub
- Pond
- River
- Rocky and sandy shore
- Saltmarsh
- Sandy shore
- Mudflat

Areas of 'Open space' are indicated as such in the Louth County Development Plan

Figure 4: Potential Wildlife Corridors Blackrock, Co. Louth