

The Irish coastline stretches for approximately 5,631 km and this area is rich in biodiversity. This is the result of the interaction of the wind and waves, working together to shape the rocks and sand and produce a range of niches in which plants and animals can live. Our coastal lands contain a variety of habitats, ranging from the familiar Sand Dune systems to the rare machair grasslands.



Sand dunes

Sand dunes form where waves encourage the accumulation of sand, and where prevailing onshore winds blow this sand inland. As the dune forms the wind starts to affect it by eroding sand particles from the windward side and depositing them on the leeward side. Gradually this action causes the dune to “migrate” inland, as it does so it accumulates more and more sand. Sand dune vegetation forms a number of zones, which are related to the time elapsed since the sand

was deposited, the degree of stability which it has attained, and the local hydrological conditions.

Embryonic dunes represent the initial stages of sand dune formation. These shifting dunes comprise unstable low hills or mounds of sand that occur above the high tide mark. Embryonic dunes rarely exceed 1 m in height. They are sparsely vegetated but typically accumulate in situations where Sand Couch (*Elymus juncea*) and Lyme-grass (*Leymus arenarius*) impede the movement of wind-blown sand. Embryonic dunes may support other salt-tolerant plants such as Sea Rocket (*Cakile maritima*), Saltwort (*Salsola kali*) and Sea Sandwort (*Honkenya peltoides*).



Marram dunes are partially stabilised hills or ridges of sand that occur along the seaward edge of the main sand dune system. As the name suggests, these dunes are dominated by the dune-building species, Marram (*Ammophila arenaria*). Marram dunes are much higher than embryonic dunes and may accumulate to heights of 15-20 m. Vegetation cover is incomplete and loose sand at the surface is subject to wind-blow. Sand Sedge (*Carex arenaria*), Sea Spurge (*Euphorbia paralias*), Sea-Holly (*Eryngium maritimum*), Cat's-ear (*Hypochoeris radicata*) and ragworts (*Senecio* spp.) frequently colonise bare sand between tussocks of Marram (*Ammophila arenaria*). Lichens and mosses are largely absent where the sand is unstable. Marram dunes that are formed primarily of siliceous (acid) sands are known as 'yellow dunes'; those comprising mainly calcareous sands are known as 'white dunes'.

Fixed dunes are stabilised ridges or hills of sand with a more or less complete cover of vegetation, the surface is stabilised and some soil development has taken place. The species composition of these dunes is highly variable but vegetation is usually characterised by species-rich grassland or heath communities. Grasses such as Red Fescue (*Festuca rubra*) and bents (*Agrostis* spp.) are typically present as is Marram. Fixed dunes are also important for orchids such as Spotted Orchid (*Dactylorhiza*



majalis) and Pyramid Orchid (*Anacamptis pyramidalis*). Extensive cover of mosses and lichens is characteristic. 'Grey dunes', a type of fixed dune, are so-called because of the abundance of grey-coloured lichens (mainly *Cladonia* and *Peltigera* spp.) in the vegetation.

Calcareous fixed dunes support a particularly wide range of plant species. On dunes which have become acidified by leaching, acid dune grassland or dune heaths develop. *Dune heaths* are usually dominated by heather (*Calluna vulgaris*). Acidic dunes which are heavily grazed by rabbits may support lichen communities. *Dune slack* vegetation occurs in wet depressions between dune ridges; it is often characterised by creeping willow *Salix repens* ssp *argentea* and a number of mosses.

Fixed dune habitats are, or have been, maintained by grazing, whether by domestic stock or by rabbits. In their absence, rough grass and scrub will grow.

Many sand dune systems in Ireland have been impacted by direct habitat loss or by alterations to the active geomorphological processes that shape them. The development of dunes as links golf course significantly alters the mix of habitats and results in the destruction of some.

Saltmarsh



Salt marshes are stands of vegetation that occur in marine and brackish water conditions on mainly sand, mud or peat that is wet, waterlogged or periodically submerged by the sea. They are typically found between the upper limits of the neap and spring tides in protected bays, estuaries, and other sections of sheltered coastline. Saltmarsh is widely distributed around the coast, but it is not an extensive habitat. The largest areas are generally associated with mudflats in our major estuaries and sea loughs such as the Broad Water Sea Lough in Mulroy Bay, Co. Donegal. The vegetation of salt marshes varies considerably depending on the degree of submersion by the sea, the salinity of the substratum or of the water (estuarine or lagoonal salt marshes), and on the intensity of grazing by livestock. Salt marshes are divided here into two types: lower and upper.

Examples of both can usually be found in most salt marsh systems. Lower and upper salt marsh may form distinct zones in some situations, particularly along the east coast of Ireland. However, more complex mosaics may also occur where the underlying topography is varied – especially in the west, with its more broken coastline. Pools, known as pans, and tidal creeks and channels are a common feature of many salt marshes, and of the larger ones in particular. Many of the original saltmarshes in Ireland were reclaimed for agriculture and those still present are generally lightly grazed. Saltmarsh is therefore a rare habitat in Ireland and, in the wider context of Europe, it is a high priority for nature conservation.

Lower salt marsh is subject to more prolonged submersion by sea water and is more strongly saline than upper salt marsh. As a result it is characterised by a predominance of or salt-tolerant plants. Common Saltmarsh-grass (*Puccinellia maritima*) usually dominates the seaward edge of the salt marsh and often forms a short turf with glassworts (*Salicornia* spp.). Dense stands of cord-grasses (*Spartina* spp.), may also occur at the lower limit of the salt marsh in some places. Further inland, Thrift (*Armeria maritima*), Sea Plantain (*Plantago maritima*) and Sea Arrowgrass (*Triglochin maritima*) are prominent in the vegetation and may occur together with Common Saltmarsh-grass (*Puccinellia maritima*) and Sea Aster (*Aster tripolium*). Lower salt marsh includes the typical 'middle marsh' communities (swards of *Armeria maritima* and *Plantago maritima*) of the east coast of Ireland. In contrast to upper salt marsh,



there is little or no cover of rushes. Some regional differences in species composition are apparent around the Irish coast, e.g. Sea-purslane (*Halimione portulacoides*) and Lax-flowered Sea-lavender (*Limonium humile*) are locally abundant in the east and south, and rare or absent in the north and west.

Upper salt marsh is subject to less frequent and less prolonged inundation by the sea and, as a result, is not as saline in character as lower salt marsh - CM1. Vegetation is typically dominated by rushes (particularly *Juncus maritimus* and *J. gerardii*) and Red Fescue (*Festuca rubra*). Creeping Bent (*Agrostis stolonifera*) may be locally abundant in more waterlogged areas. Upper salt marsh supports some species that also occur in lower salt marsh - CM1. Examples include Common Scurvygrass (*Cochlearia officinalis*), Sea Aster (*Aster tripolium*) and Sea Plantain (*Plantago maritima*). Upper salt marsh differs from lower salt marsh - in that grasses and rushes are abundant, and species that are characteristic of freshwater conditions are also present in the former, including Lesser Hawkbit (*Leontodon taraxacoides*), Marsh Arrowgrass (*Triglochin palustris*) and, on western coasts, Parsley Water-dropwort (*Oenanthe lachenalii*).

Machair

Machair is a highly specialised and complex sandy habitat that, in the entire world, only occurs along the northwest coasts of Ireland and Scotland. In Ireland it can be found along the west coast from Galway Bay to Malin Head, in Donegal, where gales and high winds are frequent. Formed when calcareous sand is blown in by prevailing winds from beaches and dunes, it comprises a flat or gently undulating sandy plain that develops on calcareous sand, with a mixture of sand dune, grassland and wetland species. Fens and flushes frequently occur, nourished by fresh water percolating through the calcareous sand. It is one of the rarest wildlife habitats in Europe.

Machair grassland forms part of a larger system that contains a mosaic of wet and dry grasslands, which have been formed by low input farming systems characterised by cattle grazing (typically in autumn and winter), hay and rotational cropping, usually of potatoes and oats. This type of management allowed wildlife to flourish and created a habitat rich in birds, plants and insects. Nationally scarce birds, such as Corncrake, Chough and important populations of breeding waders, such as Dunlin, Lapwing, Ringed Plover and Oystercatcher all breed on machair as well as rare insects such as the Belted Beauty moth and the Great Yellow Bumblebee.

The vegetation is herbaceous, with low frequency of typical sand-binding species such as *Ammophila arenaria*. The commonest species present are Red Fescue (*Festuca rubra*), Ribwort Plantain (*Plantago lanceolata*), Daisy (*Bellis perennis*), Common Bird's-foot Trefoil (*Lotus corniculatus*), Lady's Bedstraw (*Galium verum*) and White Clover (*Trifolium repens*). Development of machair is strongly associated with agriculture and human activity.

Machair was widely cultivated in the past but is now almost universally grazed, often heavily, or used for amenity (sports pitches, camp sites, caravan parks) or development. There has been a marked decline in the wildlife value of some sites due to changes in land use practices. Grazing is tending to occur all year round, with an increase in sheep grazing, which has reduced the diversity of flowering plants and has changed the structure of the grasslands. Small patches of arable crops are no longer grown. In some cases, re seeding and drainage has occurred. Where it was used for fodder, silage has replaced hay in many instances, and the earlier mowing dates have reduced the seeding by flowering plants and destroyed the clutches of ground nesting birds. In addition, recreational impacts and housing developments change the nature of the grasslands.

The sandy substrate tends to be unstable and may be disturbed by winter gales, especially if grazing is heavy.

To preserve their unique features, machair sites need to be managed sympathetically. The key elements to sympathetic farming being low intensity of grazing on pastures, later cutting of hay and silage meadows and small areas of spring sown arable crops. In general, cattle grazing at a suitable stocking rate produce a better sward structure than the equivalent level of sheep grazing, thereby providing better conditions for birds and other wildlife.



If the presence of a Corncrake is confirmed in machair, grants are available for sympathetic management, including late cutting and mowing the field from the centre outwards. Contact BirdWatch Ireland for more details.

Irish machair is designated as a priority habitat under the EU Habitats Directive and as such Ireland has special responsibility for its conservation.

Coastland Mammals and Birds

Ireland holds the largest breeding numbers of Storm Petrels in the world and holds good breeding Tern colonies. Ireland holds important numbers of Roseate Tern, with successful breeding management at Lady's Island in Wexford and on Rockabill Island in Dublin. Ireland is home to one of the largest populations of Chough found in Europe.

Waders comprise a large group of long-legged birds living near water along coastal shorelines and bog/marsh wetlands. They congregate in dense flocks on tidal mudflats and shoreline, in winter and on migration and include birds such as plovers, lapwings, sandpipers and others. These birds are renowned for striking plumage, various bill shapes, feeding techniques and long distance migrations. Most eat small invertebrates picked out of the soil/mud. Different bill sizes allow different species to feed in same habitat without competition for food.

Other birds that inhabit coastal areas are divers, grebes and some ducks.

Rabbits, foxes and badgers can also be found living around sand dune systems. Grey and harbour seals (in picture) are also commonly found around our coasts.



Protected coastal habitats

Natural Heritage Areas (NHAs)

There are 284 coastal NHAs in Ireland including:

- Blackwater River and Estuary, Co. Cork (mudflat/sandflat)
- Inishcrone Spit, Co. Mayo (sand dunes)
- Skerries Island, Co. Dublin (rocky islands)
- Booterstown March, Co. Dublin (brackish marsh)
- Hook head, Co. Wexford (rocky sea cliffs)
- Spanish Island, Co. Kerry (shingle beach)
- Aughinish Island, Co. Galway (salt marsh)
- Inisheer Machair, Co. Galway (machair)



Special Protection Areas (SPAs)

There are 61 coastal SPAs in Ireland including:

- Carlingford Lough, Co. Louth
- Rockabill Dublin
- Saltees, Wexford
- Dungarvan Bay, Co. Waterford
- Old Head of Kinsale, Co. Cork
- Skelligs, Co. Kerry
- Stags of Broadhaven, Co. Mayo

Candidate Special Areas of Conservation (cSACs)

There are nine coastal candidate Special Areas of Conservation (cSAC).

- Magherabog Dunes, Co. Wicklow
- Kilpatrick Sandhills, Co. Wexford
- Likmuckridge – Tinnberna Sandhills, Co. Wexford
- Croaghaun/ Slievemore, Co. Mayo
- Inishkea Islands, Co. Mayo
- St John's Point, Co. Donegal
- Slieve league, Co. Donegal (insert)
- Courtmacsherry Estuary, Co. Cork
- Mount Brandon, Co. Kerry]

Slieve League in Donegal is one of the nine coastal cSACs. The cliffs of Slieve League (pictured here) are said to be the highest and one of the finest marine cliffs in Europe with a three hundred metre drop straight down into the wild, Atlantic waves below.

Refuges for Fauna

Seven coastal Refuges for Fauna have been designated in the last ten years. They all relate to breeding seabird populations and are mostly remote and inaccessible. They are all NHAs:

- Rockabill, Co. Dublin
- Cow Rock
- Lady's Island Lake, Co. Wexford
- Cliffs of Moher
- Old Head of Kinsale
- Horn Head
- Bull Rock

Biogenetic Reserves

Set up under the auspices of the Council of Europe, this reserve network was set up for site conservation through the maintenance of biological balance and at the same time enabling research to be carried out on the ecosystems. Just two of the Irish Biogenetic Reserves are coastal: Lough Hyne, Co. Cork, and Ballyteige Burrow in Wexford.

Biosphere Reserves

There is one Irish coastal site under this designation - North Bull Island, Co. Dublin. Biosphere Reserves were set up by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The purpose of these reserves is to combine conservation, education, scientific research, monitoring and to involve the local community.



Wetland Sites of International Importance - Ramsar Convention

Ratified by Ireland in 1984, there are seven coastal Ramsar sites which are as follows:

- Rogerstown Estuary Nature Reserve
- Castlemaine Harbour Nature Reserve
- Baldoyle Estuary Nature Reserve
- Tralee Bay Nature Reserve
- North Bull Island and adjoining fore shore Nature Reserve
- The Raven Nature Reserve
- Wexford Wildfowl Reserve

What can I do?

Farmers:

- Avoid overgrazing of machair as this can seriously damage the vegetation structure and cause erosion. Only provide supplementary feeding in emergency situations.
- Avoid the use of fertilisers. Use fertilisers with caution on Machair grassland. Fertilisers can produce a dense grass sward (avoided by nesting birds) and reduce the plant and insect diversity.
- Where machair is used for growing hay, the mowing date also determines whether early or late flowering plants thrive. Where possible, cut after 1st August, to allow the seeding of late flowering meadow plants, and especially if a Corncrake is present. In this case, mowing the field should be from the centre outwards. Mowing followed by aftermath grazing will produce the structural diversity that creates the maximum wildlife interest.
- Get involved in the REPS scheme for coastal agricultural land.

Developers

- Golf courses and developments such as caravan parks, very close to the coast can disturb the natural development of coastal habitats and noise and light could disturb the local fauna.

Others

- Use designated paths on sand dunes where these are provided.
- Only engage in sports activities – such as horse riding or quad biking – where you know that the provider has complied with any relevant legislation.
- Don't leave rubbish on beaches or anywhere near the coast

