

DEPARTMENT OF THE ENVIRONMENT FOR NORTHERN IRELAND

DECLARATION OF AREA OF SPECIAL SCIENTIFIC INTEREST AT MURLOUGH, COUNTY DOWN.
ARTICLE 24 OF THE NATURE CONSERVATION AND AMENITY LANDS (NORTHERN IRELAND)
ORDER 1985.

The Department of the Environment for Northern Ireland (the Department), having consulted the Council for Nature Conservation and the Countryside and being satisfied that the area delineated and described on the attached map (the area) is of special scientific interest by reason of the flora, fauna and physiographical features and accordingly needs to be specially protected, hereby declares the area to be an area of special scientific interest to be known as the "Murlough area of special scientific interest".

The area is of special scientific interest because of the coastal flora, fauna and physiography. The Dundrum complex consists of the beaches and dunes at Ballykinler and Murlough, in addition to Inner Dundrum Bay and Newcastle beach. Physiographical interest lies in the sediment record associated with a prograding foreland and depositional sink, which dates back to the late Pleistocene and is of international importance. Studies of the Murlough system have been used to develop the chronology of Holocene sea-level changes in the north-east of Ireland. Modern dune deposits include the best examples of transgressive sheet and parabolic dunes in Northern Ireland, together with exceptional ridge and runnel beach forms.

The oldest sediments are buried and have been identified in boreholes. These include a range of fluvial sediments, with some infilling of earlier incised meltwater channels. A series of small arcuate bays are present along the northern shoreline of the Murlough system. The intervening headlands are the recurved ends of a fan-shaped series of low ridges. To the east, similar low-lying gravel deposits are overlain by a band of pale clay of unknown origin. Seaward of these lies a ridge of low sand dunes. These trend north-eastward, and join with higher dunes which are strongly recurved to the north and which lie on a gravel basement. Sections through these deposits show a spheroidal gravel, with no overlying clay, but well-developed podsolised surfaces incorporating iron pans. The north-eastern end of the site has a low relief. Cliff sections, exposed along the Inner Bay shoreline, show a series of southerly dipping marine gravel beds with clasts aligned and sand-supported, overlying marine sands. These gravels are composed of flat disks with greywacke shales and sandstones predominating, with some granodiorites. The gravel bars are overlain by a layer of clay, similar to that found at Murlough. All of these sediments represent the earliest development phase of the complex and some may date to the Late Glacial period, around 12,000 years BP (before present).

A poorly-exposed series of 12 sub-parallel gravel ridges underlie the main Murlough dune system, and determine to a great extent the current form of this area. The spheroidal gravels are clast-supported, dominated by greywackes, Mourne granites and porphyries and Newry granodiorite, and appear to originate from a different population to that of the older Ballykinler series. The ridges represent the main phase of gravel beach development under a relatively falling sea-level and date from post 6000 BP. Intriguingly, these gravel ridges appear to be absent from the Ballykinler area.

Further falling sea-level allowed aeolian reworking of finer sediments, notably sands. The Murlough and Ballykinler dune systems are similar, with, on the landward side, seaward-dipping sand sheets of low relief, which exhibit well-developed soils dating from 4775 BP to 600 BP. These represent up to three

periods of prolonged stability in the dune system. A series of high parabolic dunes occur, which are morphologically typical of dunes formed on a transgressive dune sheet and are higher than the landward series. The present form of these high dunes indicates the inshore migration of barcanoid dunes with transverse blowouts, exposing the underlying gravel beaches. Dated materials within buried palaeosols, indicate the parabolic dunes post date 650 BP. The sediments of both sets of Murlough dunes are very similar with a very low shell content of 2-3%, contrasting with the more shell-rich Ballykinler sands and further supporting the idea of separate origins for the two systems.

Both Ballykinler and Murlough have a low angle, dissipative, wide sand beach. Sediments are of glacial origin with little or no modern sources, and the system is therefore sedimentologically closed. The Murlough foreshore is noted for the well-developed ridge and runnel beach system, with up to five ridges exposed by extreme low spring tides. This is exceptional by Irish standards. An extensive ebb-tide delta occurs at the mouth of the channel from the Inner Bay at Dundrum, on which swash bars periodically form. Limited modern development of embryo dunes continues by localised reworking of sediments from these migrating onshore, particularly on the Ballykinler side where dune development continues at the south-western tip of this system and along the eastern shoreline of the Outer Bay. At least three dune ridges have formed around the dune edge on the ebb tide delta in recent years.

The coastal edge of the Murlough system is characterised by an irregular series of low modern dunes and foredune ridges, none of which are presently actively accreting sediment. The sand beach along much of the Murlough system is backed by a reflective gravel ridge or storm beach up to 4 m in height. An exposure of well-sorted and closely laid gravel pavement occurs in association with the mouth of the Shimna river in Newcastle. Transient partial sand ridges overlie these exposures in the summer months.

A full understanding of the Dundrum system is incomplete, with morphology interpreted as a spit structure developing as a drift-aligned prograding beach gravel plain overlain by storm ridges, or as a swash-aligned beach/barrier system across the bay with a tidal outlet, which in turn was responsible for the formation of the spit-related recurve structures.

In biological terms, Murlough is one of the best examples of a coastal system in Northern Ireland, and is notable for its extent and the wide range of plant and animal communities present, in addition to its largely unmodified nature and the number of rare plants and animals recorded. The diversity of coastal habitats present has been largely brought about by successional processes. The dune system displays an unusually intact and extensive transition, grading from actively developing foredunes, through yellow and grey dunes, to species-rich dune grassland, acid dune heath and scrub, and then to saltmarsh in Dundrum Inner Bay.

On the upper shore at Ballykinler, and periodically at Murlough, locally-distributed communities of strandline vegetation occur, with typical pioneer species like Sea Sandwort Honkenya peploides and Sea Rocket Cakile maritima. In places here, there is also some limited foredune development, mainly associated with Sand Couch Elytrigia juncea. However, a large part of the system consists of yellow dunes at the seaward end, where the sand is more mobile and accretion rates more rapid, with taller grey dunes behind, where the sand is more stable. Marram Ammophila arenaria plays the dominant role in dune-building processes over much of the yellow dunes, with occasional small stands of Lyme-grass Leymus arenarius and scattered plants of Portland Spurge Euphorbia portlandica.

The more stable grey dunes are covered by a complex mosaic of different vegetation communities, some of which are very species-rich. Marram Ammophila arenaria remains one of the main species, but there are a range of other grass and grass-like species such as Red Fescue Festuca rubra, Yorkshire-fog Holcus lanatus, Sweet Vernal Grass Anthoxanthum odoratum, Sand Sedge Carex arenaria and Field Wood-rush Luzula campestris. Herbs include Lady's Bedstraw Galium verum, Cat's Ear Hypochoeris radicata, Wood Sage Teucrium scorodonia, Common Vetch Vicia sativa, and Mouse-ear-hawkweed Pilosella officinarum. A number of orchid species are present, including Bee Orchid Ophrys apifera and Pyramidal Orchid Anacamptis pyramidalis.

This zone is also the main locus for a scarce plant association which is more typically found in southern parts of Britain, and is characterised by an abundance of Common Restharrow Ononis repens with occasional Wild Thyme Thymus polytrichus and Bird's-foot Trefoil Lotus corniculatus. The Murlough system is the only known site for this vegetation type in Northern Ireland, and it is possible that the east coast situation and the rain shadow influence of the Mourne Mountains are important factors in its presence here.

In general, the area is rather dry and wetland communities are not well-developed. However, a few dune slacks are present at Ballykinler. These are rather rank and tend to be dominated by Creeping Willow Salix repens and grasses such as Red Fescue Festuca rubra and Yorkshire-fog Holcus lanatus, with occasional Bird's foot Trefoil Lotus corniculatus and Carnation Sedge Carex panicea.

In the older dunes, where leaching has removed much of the calcium from the soil, leaving it more acidic in character, dune heath is extensive. Heather Calluna vulgaris, Bell Heather Erica cinerea and Sand Sedge Carex arenaria are constant species here, interspersed with Sheep's-bit Jasione montana, Bird's-foot Trefoil Lotus corniculatus and the mosses Hypnum cupressiforme and Pleurozium schreberi. Lichen-rich areas of heath are also well represented, with scattered plants such as Sheep's-fescue Festuca ovina growing within a moss and lichen carpet of Cladonia spp., Dicranum scoparium and Pseudoscleropodium purum. The Murlough system is the principal dune heath site in Northern Ireland.

Scrub and Bracken Pteridium aquilinum encroachment of the dune grassland is a common feature of the whole system. Gorse Ulex europaeus is frequent throughout, with scattered Bramble Rubus fruticosus and Burnet Rose Rosa pimpinellifolia. In some places, there are dense belts of Sea Buckthorn Hippophae rhamnoides.

Woodland is largely confined to the northern end of Murlough, where there is Sycamore Acer pseudoplatanus dominated woodland, with an understorey of Wood Sorrel Oxalis acetosella, Ivy Hedera helix, Bluebell Hyacinthoides non-scripta and Bramble Rubus fruticosus.

Within Dundrum Inner Bay, saltmarsh has developed at both ends of the bay. Saltmarsh Rush Juncus gerardii and Red Fescue Festuca rubra are the dominant species, with Sea Plantain Plantago maritima Lax-flowered Sea-lavender Limonium humile, Thrift Armeria maritima and Sea Rush Juncus maritimus also of frequent occurrence. Sea Purslane Halimione portulacoides and Common Saltmarsh-grass Puccinellia maritima are more prevalent around small channels, pools and hummocks.

Murlough contains many plants with a restricted distribution in the British Isles. In addition to some of those listed above, notable species include Carlina Thistle Carlina vulgaris, Viper's Bugloss Echium vulgare, Blunt-flowered Rush Juncus subnodulosus, Lesser Meadow-rue Thalictrum minus, Spring Vetch Vicia lathyroides, Shepherd's Cress Teesdalia nudicaulis, Blue Fleabane Erigeron acer, Musk Stork's-bill Erodium moschatum and Small Cudweed Filago minima. Many of these are annual species, associated with areas of bare sand. In addition, the site contains scarce bryophytes such as Rhodobryum roseum and Racomitrium canescens.

Dundrum Bay (including the outer and inner bays) is an important site for wintering wildfowl and waders. Between 1988/89 and 1992/93, numbers averaged over 3500 wildfowl and over 5800 waders. The estuarine mudflats of the Inner Bay support internationally important numbers of Light-bellied Brent Geese Branta bernicula hrota (1.1% of the international population). Other species which are important within an All-Ireland context are Common Scoter Melanitta nigra (71% of the All-Ireland population), which roost and feed in Outer Dundrum Bay and Red-breasted Merganser Merqus serrator (7.2% of the All-Ireland population). Other wildfowl species present include Great Crested Grebe Podiceps cristatus, Mute Swan Cygnus olor, and Shelduck Tadorna tadorna. In addition, important populations of several wader species have been recorded, including Oystercatcher Haematopus ostralegus (4.2% of the All-Ireland population), Redshank Tringa totanus (2.4%), Greenshank Tringa nebularia (1.9%) and Dunlin Calidris alpina (1.3%).

Significant numbers of Common Seals Phoca vitulina use the Ballykinler sand-bar as a high-water haul out site, while Grey Seals Halichoerus grypus occasionally haul out along the shore.

The Dundrum area is the most studied site for invertebrates in Northern Ireland. The area has a long history of collecting, including some of the earliest Irish insect records and associations with several notable entomologists. The heathlands and grasslands on the dunes at Murlough, which have received most attention, provide a unique insect habitat in Northern Ireland. It is unrivalled in extent and richness of species in the groups that have been well-studied. Examples of the diversity found on the site include 55 species of aculeate Hymenoptera (33% of Irish fauna), 213 species of moth (48% of Northern Irish fauna) and 21 species of butterfly, which represents 71% of the Northern Irish fauna and includes the Marsh Fritillary Eurodryas aurinia, now a threatened species throughout Europe. Many species within these groups, and other less comprehensively catalogued ones, are only known to occur in Northern Ireland at this site. This includes the minotaur beetle Typhaeus typhoeus; the solitary wasps Tachysphex pompiliformis and Crabro peltarius; the solitary bees Hylaeus brevicornis and Sphecodes pellucidus; and the bugs Gampsocoris punctipes, Neides tipularis and Trapezonotus arenarius.

The Dundrum area is known as being the northern limit of the Irish distribution of numerous predominantly southern species. A number of the species recorded are thermophilic, or heat-loving, and their distribution in the British Isles tends to be more southerly; their occurrence relatively far north is dependent upon the soils and microclimate provided on the dune system. Important features of the site are large areas of bare ground, which are vital for many of the southern species. Without these areas of ground which warm up quickly, they would otherwise find the climatic conditions unsuitable. The dune heath is especially important, due to the prevalence of these conditions and the large extent of the habitat. Aculeate Hymenoptera find conditions especially favourable, because of the large-scale availability of bare ground in which to construct their nesting burrows. Large aggregations of species are a rare feature in Ireland, but are conspicuous of the heath at Murlough. The Ballykinler dunes do not appear to provide such favourable microclimatic conditions, but there has been very little entomological work carried out here.

The dune system proper has a rather limited fauna as it lacks many of the elements that support the richest dune fauna on other sites, especially wet dune slacks. Some of the specialist fauna of the foredunes is present, although limited by the lack of recent accretion. It does contain some notable invertebrates including the woodlouse Armadillidium pulchellum, which lives under driftwood and is near the northern limit of its European range. It appears to survive only on the Ballykinler dunes. Despite the limited extent of the habitat, the saltmarsh around Dundrum Bay is known to support a rich fauna of insects, especially beetles which feed amongst the tidal debris. These include the uncommon beetles Aepus marinus, Dyschirius impunctipennis and Bembidion laterale.

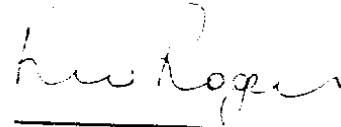
SCHEDULE

The following operations and activities appear to the Department to be likely to damage the flora and fauna of the area:

1. Any activity or operation which involves the damage or disturbance by any means of the surface and subsurface of the land, including ploughing, rotovating, harrowing, reclamation and extraction of minerals, including sand, gravel and peat.
2. Any change in the present annual pattern and intensity of grazing, including any change in the type of livestock used or in supplementary feeding practice.
3. Any change in the established method or frequency of rolling, mowing or cutting.
4. Any change in the annual pattern of application of manure, slurry or artificial fertiliser.
5. The application of herbicides, fungicides or other chemicals deployed to kill any form of wild plant, other than plants listed as being noxious in the Noxious Weeds (Northern Ireland) Order 1977.
6. The storage or dumping, spreading or discharge of any material not specified under paragraph 4 or 5.
7. The destruction, displacement, removal or cutting of any plant, seed or plant remains, other than for
 - (i) plants listed as noxious in the Noxious Weeds (Northern Ireland) Order 1977;
 - (ii) normal cutting or mowing regimes for which a consent is not required under paragraph 3.
8. The release into the area of any animal (other than in connection with normal grazing practice) or plant. 'Animal' includes birds, mammals, fish, reptiles, amphibians and invertebrates; 'Plant' includes seed, fruit or spore.
9. Burning.
10. Changes in tree or woodland management, including afforestation, planting, clearing, selective felling and coppicing.

11. Construction, removal or disturbance of any permanent or temporary structure including building, engineering or other operations.
12. Alteration of natural or man-made features, the clearance of boulders or large stones and grading of rock faces.
13. Operations or activities which would affect wetlands (including marsh, fen, bog, rivers, streams and open water), eg:
 - (i) change in the methods or frequency of routine drainage maintenance;
 - (ii) modification in the structure of any watercourse;
 - (iii) lowering of the water-table, permanently or temporarily;
 - (iv) change in the management of bank-side vegetation.
14. The killing or taking of any animal in a manner likely to affect the continued existence of the species within the area except as provided for under the terms of the Wildlife (Northern Ireland) Order 1985.
15. The following activities undertaken in a manner likely to damage or disturb the wildlife of the area:-
 - (i) Educational activities;
 - (ii) Research activities;
 - (iii) Recreational activities;
 - (iv) Exercising of animals.
16. Changes in game, waterfowl or fisheries management or fishing or hunting practices.

Sealed with the Official Seal of the
Department of the Environment for
Northern Ireland on 15 February, 1995



R W Rogers
Assistant Secretary

M. Cunningham
CIVIL SERVANT OF
CLARENCE COURT, BELFAST.

FOOTNOTES

- (a) Please note that consent by the Department to any of the above operations or activities does not constitute planning permission. Where required, planning permission must be applied for in the usual manner to the Department under Part IV of the Planning (NI) Order 1991. Operations or activities covered by planning permission are not normally covered in the list of Notifiable Operations.
- (b) Also note that many of the operations and activities listed above are capable of being carried out either on a large scale or in a very small way. While it is impossible to define exactly what is "large" and what is "small", the Department would intend to approach each case in a common sense and practical way. It is very unlikely that small scale operations would give rise for concern and if this was the case the Department would give consent, particularly if there is a long history of the operation being undertaken in that precise location.