COASTAL SAND DUNES

What are coastal SAND DUNES?

Sand dunes can form anywhere where there is a supply of dry sand and the wind to move it. Dry sand is blown landwards and deposited above the high water mark. An obstacle in the path of the sand, such as clump of rotting seaweed, can provide a barrier and eventually a mound of sand builds up behind the obstacle. This process produces a fore-dune which is the beginning of the formation of a dune system.

Fore dunes contain just enough organic debris to allow plants to grow. The first plants to take root are those with long gripping root systems such as sea rocket and sea beet. As more sand builds up, the dune is eventually colonised by marram grass to form mobile dunes. Marram grass is extremely efficient at trapping sand and as the rate of sand deposition slows down, semi-fixed dunes are formed. An increasing number of plant species can be found. As the surface stabilises, some soil development takes place. As soil develops further and a closed sward is established, fixed dune grassland develops. Dune slacks are the hollows between the dunes. Moisture may collect here and form small pools.

Where are they found in the UK?

The Sand Dune Survey of Great Britain (1993-1995) listed the total area of sand dunes as being 11,897ha in England and 8,101ha in Wales. The ongoing Sand Dune Vegetation Survey of Scotland indicates that there may be as much as 33,000ha around Scottish coasts. Major dune systems are widely distributed in the UK, being found on all the English coasts except the English Channel and the Thames Estuary.

Why are coastal sand dunes of CONSERVATION IMPORTANCE?

Sand dunes are amongst the most fragile habitats around the UK coast. They are also one of the most important habitats for wildlife. A wide variety of species can be found in sand dunes. Sand dunes provide the most suitable habitat for warm-loving invertebrates in Britain; there is an ample supply of bare ground and open-structured vegetation with sunny sheltered slopes, shelter and variety. Sand dunes also represent nursery

Other action plans and statements covering issues relevant to coastal sand dunes:-

- LITTLE TERN***
- STRANDLINE***

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habitats providing the early stages of natural plant succession.

Dune grassland and dune slacks support a wide variety of colourful flowering plants including a number of species of orchid. They are rich in invertebrates which include butterflies, moths, burrowing bees and wasps.

Dune slacks can be very species rich, if they are seasonally waterlogged, with plants such as bog pimpernel, round-leaved wintergreen and marsh helleborine. If the soil is permanently waterlogged, then rushes (*Juncus species*) and *Sphagnum* species (bog mosses) will dominate; acid bog conditions will result.

Rare animals found in sand dunes in some parts of the country include natterjack toad and sand lizard.

Historically, dunes have been regarded as low value wastelands and exploited with little regard for the dune system and their inhabitants. They have been used for a variety of purposes, initially for grazing, through to development, industry and military uses. More recently they have been used for leisure activities such as horse riding, golf courses and camping.

Sand dunes provide an ideal habitat for studying the development of plant communities; a well developed sequence of sand dunes is an important educational resource.

COASTAL SAND DUNES IN THE DURHAM AREA

What is the state of coastal sand dunes in the DURHAM AREA?

Overall, the sand dunes in the Durham area are in variable condition. At Crimdon, parts of the dune system are in reasonable condition. As the cliffs decline in height towards the south of the site so the dune systems become more extensive. Compared to other dunes systems in the country the dunes are not particularly good examples, but the typical dune zonation sequence is evident at Crimdon. The most seaward dunes are colonised by marram with smaller amounts of sand couch and lyme-grass. Inland, the vegetation cover increases. Sand sedge, marram and red fescue all occur with herbs such as yarrow, common-spotted orchid and creeping cinquefoil. Daisy, birds foot trefoil and fairy flax are found in shallow depressions in these dunes. The tall dune grassland is characterised by the presence of bloody cranesbill.

On the beach at Crimdon, the presence of a narrow strandline reveals where embryo dunes are trying to form. There is potential to increase the area of dunes and improve the quality of the habitat through active management.

The dunes at the north end of the beach at South Shields are located between the sea and extensive leisure developments; they are subjected to excessive disturbance and recreational pressures. Currently they are in very poor condition, with sparsely populated yellow dunes and a transition to dune grassland at the northern end of the site. Vegetational succession is almost non-existent, with only small areas of marram grass surviving. At the southern end of the beach, the condition of dunes is better, but the location of the car park behind the beach means that dunes are unable to develop beyond yellow dunes.

The area of sand dune at Whitburn Bents is, as mentioned, very small and is not at present in good condition.

WHERE do they occur in the Durham area?

Coastal sand dunes are a scarce and very localised habitat in the DBAP area. The documented area is 11.5ha in County Durham (which is 0.04% of the national area of sand dunes) with a further 15ha in South Tyneside. The dunes in County Durham are located at Crimdon where the dune area within the coastal SSSI, is also part of the Northumbrian Coast SPA and the Durham Coast NNR. The site of the little tern colony is in close proximity to the dune system. The dunes at South Shields are designated as a Site of Nature Conservation Interest (SNCI). In Sunderland, there is a very small area of sand dune (less than 1ha) at Whitburn Bents. The area is currently classified as an SNCI. Because of their scarcity, both the dune systems are potentially of regional importance. They have the potential for considerable improvement with regard to their value for wildlife and should be regarded as a valuable local resource.

COASTAL SAND DUNES

Coastal sand dunes are at RISK from:

EROSION - the seaward edges of sand dune can be highly mobile. As very few sand dune systems in the UK are in equilibrium, most sand dune systems demonstrate net erosion. The most common cause is an insufficient supply of sand. Landward movement of mobile dune systems often leads to loss of fixed dunes and dune heath habitat. Development behind dunes e.g. Crimdon caravan park and "Pony World" prevent the landward movement of dunes as does recreational development at South Shields.

RECREATION - sand dunes provide a very attractive feature, which are enticing to visitors and are frequently found on easily accessible areas of coastline. Recreation is a major use of sand dunes and a major cause for concern. Coastal dunes are used extensively by day trippers and holiday makers. Off-road cycling, horse riding, motorcycling and excessive numbers of people moving between the beaches and car parks may bring unacceptable pressures to bear on sand dunes. Large numbers of visitors use the beaches and dunes at Crimdon and South Shields.

BEACH MANAGEMENT - the seaward accretion of dune systems takes place through the accumulation of windblown sand caught by plants and debris along the strandline; these initial accumulations are colonised by pioneer plant species and form embryo dunes. This process may be inhibited by vehicles on the beach and by mechanical beach cleaning. These activities may remove minor obstacles which initially catch the sand or destroy embryo dunes at an early stage of dune formation.

LITTER AND BEACH CLEANING - litter left by visitors and washed up on the beach is a big problem, which can harm wildlife. Mechanical beach cleaning is also a problem. It not only removes minor obstacles which catch the sand, but also removes natural debris that is part of the sandy shore habitat. Sand is compacted during cleaning, reducing air spaces which provide air for burrowing organisms.

INVASION BY NON-INDIGENOUS SPECIES - sea buckthorn has been used in the past to stabilise dunes. It is now recognised as an invasive species which reduces plant and invertebrate diversity. It is present on the Durham coast.

RISING SEA LEVELS -this will lead to increased erosion at the base of the dune system, "coastal squeeze" and direct habitat loss.

COASTAL DEFENCE WORKS - lead to indirect loss of sediment supply. Direct extraction of sand for building, may halt or slow the development of dunes, owing to the loss of sediment supply. The adverse effects of this only become apparent in the long term.

Coastal sand dunes BENEFIT from:

LEGAL PROTECTION and the implementation of appropriate management regimes within the framework of a management plan for the dunes themselves - the dunes at Crimdon are within the coastal SSSI and NNR. The dunes at South Tyneside are designated as a SNCI.

FURTHER RESEARCH into management of dune systems and the production of guidance documents.

SHORELINE MANAGEMENT PLANS which allow maximum possible free movement of sediment.

RECREATION MANAGEMENT - visitor car parking and access should be carefully managed to encourage visitors to stick to set paths and to park only in designated areas. Zoning of activities can be considered.

THE PROVISION OF INTERPRETATION which explains why management of habitat and access is necessary and gains the co-operation of visitors by explaining how they can help.

Important SPECIES for sand dunes:

SAND COUCH GRASS
LYME GRASS
SEA ROCKET
MARRAM GRASS
BLOODY CRANESBILL
PYRAMIDAL ORCHID
PURPLE MILK-VETCH
SAND SEDGE

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TARGETS

1 *Stabilise and maintain the current area of dunes at Crimdon and South Tyneside.* (2002)

2 *Ensure that all SSSI dune grasslands are in favourable condition via appropriate management.* (2005)

3 *Improve the condition of poor quality dunes that are degraded by neglect, inappropriate management and excessive recreational pressures.* (2005)

4 *Implement visitor management provision - to enable visitors to enjoy the dunes in a sympathetic and sustainable manner.* (2005)

5 *Increase the area of good quality sand dunes via active management by 10ha.* (2010)

6 *Raise awareness of the conservation importance of sand dunes. Involve the local community in their conservation and management.* (2005)

7 *Monitor the wildlife value of the sand dunes in the DBAP area.* (2002)

8 *Include contingencies for managing sand dunes as part of local strategic plans such as the ICZM Plan.* (2002)

ACTION PLAN

ACTION	DATE	Possible PARTNERS	Meets TARGET No.
POLICY AND LEGISLATION			
1. Ensure that the importance of dunes and dune grasslands and measures for their management are included in local planning documents - i.e. local, regional plans, ICZM plans, SMPs.	ONGOING	EDC, STMBC, DCC DEFRA	1, 2, 3, 8
2. Develop coastal zone management policies which allow the maximum possible free movement of sediment and so maximise the potential for dune formation, migration and conservation - SMPs, ICZM.	ONGOING	STMCC, EDC, DCC, DEFRA	1, 2, 3, 8

continued…

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ACTION PLAN

ACTION	DATE	Possible PARTNERS	Meets TARGET No.
SITE SAFEGUARD AND MANAGEMENT			
3. Produce a management plan for Crimdon sand dunes.	2001	EDC	1, 2, 3, 4, 5, 6, 7, 8
4. Secure appropriate management for designated sites - SSSIs, NNR, SNCI, LNR.	ONGOING	EN, EDC, DCC, STMBC	1, 2, 3
5. Control non-native species where they are a problem e.g. sea buckthorn.	IF REQUIRED	EN, EDC, STMBC, Local voluntary conservation groups	2
6. Protect dune systems from development on adjoining land and behind the site.	2001	EDC, STMBC, DCC	1, 2, 5
7. Commence active dune management works. Protect the strandline from the effects of mechanical beach cleaning. Re-establish vegetation by transplants or reseeding.	2001	EDC, STMBC Local community and conservation groups	1, 2, 3, 5
8. Develop a sustainable strategy for visitor management as part of management plan for dunes area. Manage public access by either permanent restrictions to some areas or by use of rotational fencing-off of compartments. Consider having areas where there are no restrictions on visitor use.	2001	EN, EDC, STMBC, DBAP, Local community groups	1, 2, 3, 4, 5, 6, 8
9. Manage the access and use of the beach by unauthorised vehicles e.g. restrict access by blocking "choke points".	2001	EDC, STMBC, DCC	1, 3, 4, 6
10. Concentrate visitor parking in one designated area. Discourage parking at other points or along road behind the beach.	2001	EDC, STMBC	1, 3, 4, 6
RESEARCH AND MONITORING			
11. Collect baseline data about vegetation for a monitoring programme.	2001	EN, EDC, STMBC	1, 2, 7

continued…

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ACTION PLAN

ACTION	DATE	Possible PARTNERS	Meets TARGET No.
RESEARCH AND MONITORING continued			
12. Monitor the progress of dune re-establishment.	2002	EN, EDC, STMBC, SCC	2, 3, 5, 7, 8
13. Monitor the wildlife value of coastal sand dunes - plants, invertebrates etc.	2002	EN, EDC, STMBC	7, 8
ADVISORY			
14. Provide advice to local authorities regarding sand dune management for biodiversity.	ONGOING	EN, DBAP, DWT	1, 2
COMMUNICATION AND PUBLICITY			
15. Promote the value and significance of sand dunes to local people through interpretation, education and public events.	2001 onwards	EN, EDC, DWT, STMBC	4, 6, 8
16. Raise awareness of the formation of sand dunes and of the importance of maintaining the mobility of the soft coastline.	2001 onwards	EDC, STMBC, EN	4, 6
17. Produce a code of conduct for visitors - to encourage them to keep to marked paths, avoid trampling vegetation.	2001	EDC, STMBC, DBP, EN	4, 6