Sand Dunes
Biodiversity Action Plan

Habitat Description

The Sand Dunes BAP includes embryo dunes, yellow dunes and grey dunes.

Dunes are ridges of sand created from a source of intertidal sand by the wind. Plants resistant to salt spray and wind damage colonise the sand which in turn traps more sand, in time marram grass *Ammophila arenaria* and couch *Elytrigia spp*. colonise the embryo dunes and this has the effect of stabilising the dunes by binding the sand substrate together, and this allows other plants to colonise.

Dunes accrete (grow and extend) and erode.

Dunes are restricted to the north-west coast, mainly at the Ayres, but smaller patches occur at Ramsey, Silversands (south of Niabyl) and Ballateare.

- **Embryo dunes**
  These are unstable, low ridges of sand, found on the foreshore, with characteristically very open plant cover. Sand couch *Elytrigia juncea* is generally a typical coloniser of fore-dunes but is rarely found on the Isle of Man. Other pioneer species may include marram, sea rocket *Cakile maritime*, oraches *Atriplex spp*. sea saltwort *Salsola kali* and sea sandwort *Honkenya pepiloides*.

- **Yellow dunes**
  Yellow dunes are dominated by marram grass and bare sand. Plant species include sea holly *Eryngium maritimum* and sea bindweed *Calystegia soldanella.* Fungi include dune cavalier *Melanoleuca albifolia*, dune ink cap *Coprinus ammophilae* and dune stinkhorn *Phallus hadriani.*

- **Grey dunes**
  Grey dunes are stable and have almost complete vegetation cover of a variety of species. Marram is usually present but no longer dominant, and mosses and lichens may occur. Indicator species include pyramidal orchid *Anacamptis pyramidalis* (Sch. 7), Portland spurge *Euphorbia portlandica* (Sch. 7), sea spurge *Euphorbia paralias*, Isle of Man cabbage *Coincya monensis subsp. monensis* (Sch. 7), dune fescue *Vulpia fasciculate* (Sch. 7), dune waxcap *Hygrocybe conicoides,* scarce crimson and gold moth *Pyrausta sanguinalis* (Sch. 5) and common lizard *Zootoca vivpara*. (Sch. 5). Nesting habitat for curlew *Numenius arquata*, meadow pipit *Anthus pratensis* and skylark *Alauda arvensis.*

Habitat Description continued …

Notable invertebrates recorded in the dunes include:

Megalonotus dilatatus (Nationally Scarce Nb)
Smicromyrme rufipes (Nationally Scarce Nb)
Otiorhynchus desertus (Nationally Scarce Nb)
Cleonus piger (Nationally Scarce Nb)
Hypera dauci (Nationally Scarce Nb)
Simbinia primitus (Nationally Scarce Nb)
Hypocaccus rugiceps (Nationally Scarce Nb)
Baeckmanniolus dimidiatus (Nationally Scarce Nb)
Aclypea opaca (Nationally Scarce Na)
Gabrius keysianus (Nationally Scarce Na)
Crypticus quisquilius (Nationally Scarce Nb)
Coast dart *Euxoa cursorial* (Nationally Scarce Nb)
Sand dart *Agrotis ripae* (Nationally Scarce Nb)
Shore wainscot *Mythimna litoralis* (Natioanlly scarce Nb)
White colon *Sideridis albicolon (Nationally scarce Nb)*

Habitat Area[1]

Total area ha	Largest area ha	Smallest area ha	Mean size ha	% of IoM	% Semi-Nat. Habitat
74.92	35.24	0.12	4.99	0.13	0.46

Threats

Sand Extraction
Up until the 1980's sand was extracted from the dunes on the Ayres NNR for the building trade and only 750m of naturally formed dune now remains. Much of the dune system is now protected by ASSI designation: Central Ayres ASSI, Ramsey Mooragh Shore ASSI and Cronk y Bing ASSI.

Development
Direct loss of habitat; cumulative impact.

Change of Land Use
Any change from the current management could result in the degradation and loss of habitat.

Invasive Non-Native Species (INNS)
In the past garden waste has been dumped in the dunes and this has led to the establishment of monbretia *Crocosmia x crocosmiiflora* (Sch. 8), Japanese rose *Rosa rugosa*, New Zealand flax *Phormium tenax*. All three species are capable of expanding and outcompeting native flora.

Sea Level Rise[2]
Global mean sea level (GMSL) has risen about 19cm since 1900, at an accelerating rate and was at its highest value ever in 2019. Climate models project a GMSL rise over the next 100 years ranging between 0.29 to 0.59m for low emissions scenario and 0.61 to 1.10 for high emissions scenario. Models that include a faster disintegration of the polar ice sheets predict a rise of up to 2.4m in 21—and up to 15m in 2300. The dunes act as natural sea defence from sea level rise; if they are breached extensive areas will be flooded.

[1] Sayle, T., Lamb, J., Colvin, A. & Harris, B. (May 1995) Isle of Man Ecological Habitat Survey – Phase 1 1991 – 1994 Final Report, Isle of Man Government
[2] https://www.eea.europa.eu/data-and-maps/indicators/sea-level-rise-7/assessment

Threats continued ....

Coastal Erosion
The east and west coasts are eroding and a substantial amount of material has been lost from Ramsey Mooragh Shore. Some of the eroded material is being deposited at Rue Point and this area is rapidly accreting, however due to the change in the profile of the shore at Rue Point erosion of the dunes to the north-west of Rue Point is currently taking place.

Coastal Squeeze
Due to the development of the land adjacent to Ramsey Mooragh Shore there is no flexibility for the dune system to roll back in response to the coastal erosion.

Over Stabilisation of Dunes
Natural Resources Wales has initiated a project called Sands of LIFE to revitalise sand dune systems across Wales that have become overly stabilised[3]. Many rare species are associated with the early stages of dune development and require bare sand. The dunes on the Ayres have a variety of successional stages due to the historic extraction of sand. Over stabilisation needs to be monitored on the NNR going forward to ensure there are sufficient areas of bare sand for specialist species.

Trampling and Vehicle Erosion
Trampling can be a major issue at some dune systems in the British Isles e.g. Maharees[4]; marram grass will not grow in areas that are regularly trampled and the sand is mobile if it is not fixed by marram grass. Motor bikes have been used in the sand dunes at Cronk y Scotty and this is the best location for the Isle of Man cabbage. It is thought that the plant is able to seed into the open sand created by the motorbikes. Vehicle movement at Point west is having a detrimental impact on the dunes.

Plastics
Over the years a large number of plastic items have been accumulated and buried in the dunes. It is likely that the sand particles are mixed with micro-plastic particles. Micro-plastics may be ingested by animals and accumulate up the food chain.

Scrub Invasion
Sporadic plants of European gorse, hawthorn and sycamore occur in the dunes; if these plants become well established they will out-compete the dune specialists.

Reason for BAP

Restricted habitat just 0.13% of IoM, associated rare fauna and flora, threats listed.

Aims

- Maintain the extent of sand dune habitat and associated animal and plant communities
- Maintain the condition of sand dune habitat and associated animal and plant communities
- Enhance and extend the areas of sand dune habitat and associated animal and plant communities
- Set up scheme to routinely survey and monitor condition and of the habitat and establish a base line for conservation of associated flora and fauna.

[3] https://naturalresources.wales/about-us/our-projects/nature-projects/sands-of-life/?lang=en
[4] https://www.ccatproject.eu/wp-content/uploads/2020/11/Martha-Farrelly_Maharees_CCAT.pdf

Habitat Management

Detailed habitat management can be found at:
UKCEH, UK Sand Dune and Shingle Network and Dynamic Dunescapes partners (2021). The Sand Dune Managers Handbook. Version 1, June 2021. Produced for the Dynamic Dunescapes (DuneLIFE) project: LIFE17 NAT/UK/000570; HG-16-08643

Linked BAPS

Habitats

- Coastal grassland
- Coastal heathland
- Dune scrub
- Dune grassland
- Dune heathland
- Bare sand
- Lichen/Bryophyte heath
- Dune slack

Species

Plants

- Isle of Man cabbage *Coincya monensis subsp. monensis*

Invertebrates

- Scarce crimson and gold *Pyrausta sanguinalis*

Birds

- Curlew *Numenius arquata*
- Meadow pipit *Anthus pratensis*
- Skylark *Alauda arvensis*

Delivery Options	Active	Challenges
Undertake 5 yearly Common Standards Monitoring on all ASSI's (including extent of habitat and condition).	No	Resources
Designate the remaining areas of dune and dune grassland ASSI's (Rue Point to Cronk y Bing, Point of Ayre to the Ayres NNR boundary and Cronk y Scotty).	No	Resources Requires political support
Monitor and submit representations for planning applications	Yes	
Legislation to further the conservation of the living organisms and types of habitat of principle importance for the purpose of conserving biodiversity similar to NERC 2006 Section 40 & 42.	No	Resources Requires political support
Forward planning policy – inclusion of BAP habitats and species in future updates of the Isle of Man Strategic Plan.	Underway	Resources Requires political support
Determine rates of coastal erosion and accretion 3 yearly with government updates of aerial photographs.	Yes	
Where specific areas of erosion are identified consider a more intensive monitoring programme using drones	No	Resources
Investigate options for Ramsey Mooragh Shore ASSI, benefits for biodiversity and natural coastal flood defence. Geomorphological evaluation study required first.	No	Resources
Monitor extent of INNS	Yes	
Control of INNS	Ad hoc	Resources
Removal of large plastic items	Yes	
Monitor extent of scrub	Yes	
Control of scrub	No	Not currently required
Monitor extent of bare sand areas	Yes	

Delivery Options continued …	Active	Challenges
○ Create band sand areas	Ad hoc	
○ Education/Awareness raising	Yes	
○ Annual review and update of this document	By 1/12/2023	