

Braunton and Northam Burrows

Along most of the North Devon coast, high land drops precipitously into the sea, resulting in relatively few of the wide bays suitable for sand dune formation. There are small dune systems at Woolacombe and Croyde to the north, but the largest area suitable for dune formation is in the wide double estuary of the Taw and Torridge. Braunton and Northam Burrows are extensive areas of sand dunes lying on either side of this estuary. Braunton Burrows, to the north of the mouth of the estuary, extends 6 km from north to south and is 1.5 km across. It is one of the largest dune systems in the UK and by far the largest in Devon (May 2003). It has a large and diverse flora and has attracted botanists since the 17th century. Northam Burrows, to the south of the estuary is a smaller area and has been unappreciated because it is less rich botanically, but it has many interesting features and should be considered as part of the same biogeographical system associated with the Taw / Torridge Estuary. Within the estuary, there is another small dune system at Instow on the eastern side of the Torridge.

Both sites have a number of national and international conservation designations. Braunton Burrows Site of Special Scientific Interest (SSSI) occupies around 1,350 ha, whereas at Northam Burrows the area notified is much smaller at just over 400 ha (Natural England 2015). Braunton Burrows SSSI is also designated as a Special Area of Conservation (SAC) under the European Commission Habitats Directive. Part of Braunton Burrows was a National Nature Reserve (NNR) until 1996, when a dispute over management led to its de-designation, a unique occurrence in the history of NNRs. The Taw / Torridge Estuary, its surrounding sand dune systems, the sea to just beyond Lundy and the catchment areas of the Rivers Taw and Torridge are now part of the UNESCO North Devon Biosphere Reserve, of which Braunton Burrows is the 'core area' (North Devon Biosphere 2015). Braunton and Northam Burrows are also part of the North Devon Area of Outstanding Natural Beauty and lie on the North Devon Heritage Coast. Both SSSIs include golf courses, in the case of



Strand line and fore dunes at Braunton Burrows looking north towards Saunton Down.

Areas of outstanding botanical interest

Northam Burrows occupying a significant proportion of the site. Although not ideal from a conservation point of view, this at least protects these areas from more damaging development.

Under current monitoring criteria only 23% of Braunton Burrows is in 'favourable condition' (Natural England 2015), owing to colonisation of dune habitats by scrub. However, there is no doubt that Braunton Burrows is an extraordinary and beautiful place, appealing not just to specialists but to anyone who can appreciate the magnificent spectacle and variety of flowers, particularly in June and July. At least 500 species of flowering plants and ferns have been recorded, including a number of very rare plants, which have made it a Mecca for botanists since the time of John Ray, who reported Round-headed Club-rush *Scirpoides holoschoenus* as having been found by a Mr Stephens. Since then there have been a number of studies of the vegetation of the Burrows. Of principal importance is the work of F.R.Elliston-Wright, which is summarised in the Flora (1939). A series of ecological studies was undertaken by A.J.Willis *et al.* (Willis *et al.* 1959, Willis & Yemm 1961, Willis 1963), which shed light on the contribution of the nutrient regime to the unique flora. The range of habitats extends from the strand line on the beach through foredunes, mobile dunes, dry dune grassland, wet dune slacks, fixed dunes and scrub. Although not intact over the whole site, the complete successional sequence is still present. The colourful illustrated account of the wild flowers of Braunton Burrows by Mary Breeds (Breeds 2004) is highly recommended.

Northam Burrows is much less rich botanically, with a smaller and less impressive area of dunes. A significant area has been modified to form a very large golf course. Nevertheless more than 300 species have been recorded and there is a good range of habitats with some features that are absent from Braunton. In addition to



Fixed dune grassland at Braunton Burrows with Common Restharrow *Ononis repens* and Lady's Bedstraw *Galium verum*.

the dunes, grassland and scrub, there are areas of saltmarsh and grazing marsh. There is a long pebble ridge on the seaward side that protects the dunes, which in turn prevent the pebbles being driven inland as is occurring to the south. The pebbles are derived from the cliffs south west of Westward Ho! and their northward drift is halted by the estuary. The two areas are complementary in that they are essential parts of the same system at the mouth of the large estuary.

Strand line vegetation just above the high water mark, includes Sea Beet *Beta vulgaris* subsp. *maritima*, Sea Rocket *Cakile maritima* and Prickly Saltwort *Salsola kali*, at both Braunton and Northam. Sea Sandwort *Honckenya peploides* and Frosted Orache *Atriplex laciniata* also occur at Braunton. Yellow Horned-poppy *Glaucium flavum* grows at the southern end of Braunton Burrows on the stony beach above the estuary, but has been recorded more frequently at Northam, where there is a greater area of suitable habitat.

Relatively small areas of classic low foredunes dominated by Sand Couch *Elytrigia juncea* occur towards the south of Braunton Burrows. Over much of the length of the dunes, however, the strand line vegetation gives way directly to a line of tall mobile dunes, dominated by Marram *Ammophila arenaria*. At Northam, *E. juncea* is frequent along the boundary between the pebble ridge and the dunes. Other typical plants of mobile dunes at both Braunton and Northam are Sea Spurge *Euphorbia paralias*, Sea Bindweed *Calystegia soldanella*, Sea-holly *Eryngium maritimum* and Sand Sedge *Carex arenaria*. The rare Sea Stock *Matthiola sinuata* occurs at both sites and seems to be increasing at Braunton.

Inland from the mobile dunes at Braunton is a series of dry semi-fixed dunes, which reach heights of over 30 m above sea level. The plants here are mainly biennials and annuals, adapted to the dry conditions. Viper's-bugloss *Echium vulgare* is abundant as are the Evening-primroses *Oenothera glazioviana* and *O. biennis*. Other species common in this habitat are Carline Thistle *Carlina vulgaris*, Blue Fleabane *Erigeron acris*, Portland Spurge *Euphorbia portlandica*, the seaside form of Wild Pansy *Viola tricolor* subsp. *curtisii* and the introduced Sand Toadflax *Linaria arenaria*. Hound's-tongue *Cynoglossum officinale* is especially characteristic of this habitat as are Dune Fescue *Vulpia fasciculata* and Sand Cat's-tail *Phleum arenarium*, all three of which are also frequent at Northam. Henbane *Hyoscyamus niger* is locally abundant at Northam, though recently it appears to be much less frequent at Braunton.

The semi-fixed dunes give way to dry dune grassland with a short sward resulting from heavy rabbit grazing. Because the sand at Braunton is shell-rich, the plant communities are characteristic of dry calcareous grassland, a habitat that is otherwise lacking in North Devon. In summer this area is a blaze of colour. Common plants in this habitat are Wild Thyme *Thymus polytrichus*, Lady's Bedstraw *Galium verum*, Common Bird's-foot-trefoil *Lotus corniculatus*, Biting Stonecrop *Sedum acre*, Common Restharrow *Ononis repens*, Dove's-foot Crane's-bill *Geranium molle*, Common Stork's-bill *Erodium cicutarium* and Western Eyebright *Euphrasia tetraquetra* with some Confused Eyebright *E. confusa* and Common Eyebright *E. nemorosa*. In spring Rue-leaved Saxifrage *Saxifraga tridactylites* and Common Whitlowgrass *Erophila verna* are common and later, Common Broomrape *Orobanche minor* can occasionally be found, as can Moonwort *Botrychium lunaria*.

Dune slacks form in depressions between the dunes. Because they are close to the water table underlying the dunes, they are often flooded in winter and remain damp except in very dry weather. The vegetation is similar to marshy grassland, with Water Mint *Mentha aquatica*, Marsh Pennywort *Hydrocotyle vulgaris*, Bog Pimpernel *Anagallis tenella* and Lesser Spearwort *Ranunculus flammula* typical of wetter areas. Amongst more local plants, the dune form of Creeping Willow *Salix repens* var. *argentea* is abundant in many of the slacks, trapping the blown sand to form distinctive rounded hummocks. Round-leaved Wintergreen *Pyrola rotundifolia* subsp. *maritima* is locally frequent. Three species of gentian have been recorded: Autumn Gentian *Gentianella amarella*, Early Gentian *G. anglica* and Dune Gentian *G. uliginosa*. Other plants include Strawberry Clover *Trifolium fragiferum*, Variegated Horsetail *Equisetum variegatum*, Knotted Pearlwort *Sagina nodosa*, Lesser Centaury *Centaureum pulchellum* and Small-fruited Yellow-sedge *Carex oederi*. Lesser Water-plantain *Baldellia ranunculoides* is found in several of the wetter slacks. The small fern Adder's-tongue *Ophioglossum vulgatum* is locally frequent in the older inland slacks.



Red Ruby Devon cattle grazing a dune slack at Braunton Burrows.

Three very rare plants are found in the slacks. Sharp Rush *Juncus acutus* is fairly widespread and locally abundant at both Braunton and Northam. *Scirpoides holoschoenus* first reported by John Ray in 1662, and for which Braunton is one of only two British sites, occurs mostly in the southern part of the dunes. Water Germander *Teucrium scordium*, another national rarity has its largest UK population at Braunton and a very small colony still persists at Northam, though now threatened by scrub encroachment. There had been a substantial decline in population due to habitat change but work in the last few years has recreated suitable habitat with an increase in the population in a few slacks.

Braunton Burrows is especially notable for the number and variety of its orchids. Early Marsh-orchid *Dactylorhiza incarnata* subsp. *coccinea* and Southern Marsh-orchid *D. praetermissa* are common in slacks but the most abundant orchid here is Marsh Helleborine *Epipactis palustris*. The Fragrant Orchid *Gymnadenia densiflora* has colonised one of the southern slacks and is gradually increasing. Sadly Fen Orchid *Liparis loeselii*, discovered in 1966 (Willis 1967), has not been seen for some years. On the dry calcareous grassland, Pyramidal Orchid *Anacamptis pyramidalis* is often abundant. Bee Orchid *Ophrys apifera* including the rare variety *O. apifera* var. *belgarum* occurs on the landward face of the mobile dunes.

Further inland, there are more extensive freshwater marshy areas supporting tall herb communities, including Meadowsweet *Filipendula ulmaria*, Ragged-Robin *Silene flos-cuculi*, Common Marsh-bedstraw *Galium palustre*, Yellow Iris *Iris pseudacorus* and Purple-loosestrife *Lythrum salicaria*, with Parsley-leaved Water-dropwort *Oenanthe lachenalii* in brackish areas. Beaked Tasselweed *Ruppia maritima*, another specialist of brackish marshes, occurs at Northam and elsewhere in the estuary.

There are also ponds of various ages and sizes that have been created since the mid-1970s. These have been colonised by reed swamp plants such as Bulrush *Typha latifolia*, Water-plantain *Alisma plantago-aquatica*, Brookweed *Samolus valerandi*, Grey Club-rush *Schoenoplectus tabernaemontani* and Common Reed *Phragmites australis*. Five species of Pondweed *Potamogeton* have been recorded including Fen Pondweed *P. coloratus*, which is currently found nowhere else in Devon. Water-violet *Hottonia palustris*, which appeared in one of these ponds in the 1990s, is thought to have been introduced. This is its only site in Devon. Two other British native species that are not native in Devon, Water-soldier *Stratiotes aloides* and White Water-lily *Nymphaea alba*, have become invasive in two of the ponds.

Saltmarsh with pioneer plants such Glasswort *Salicornia* spp. is developing to the east of Crow Point at the southern end of Braunton Burrows. There is a larger area at the Skern at Northam, and saltmarsh fringes the estuary for a considerable distance up both the Taw and the Torridge. Available records suggest that the saltmarsh further up the estuary is more species-rich than at Braunton and Northam themselves.

As a result of the decline in rabbit grazing, natural succession is leading to increasing areas of tall grassland and scrub. Some of the grassland is initially herb rich and colourful. Yellow-rattle *Rhinanthus minor* and Wild Carrot *Daucus carota* are abundant and Yellow Bartsia *Parentucellia viscosa*, Red Bartsia *Odontites verna* and Musk Mallow *Malva moschata* occur quite frequently, as well as many common species such as Oxeye Daisy *Leucanthemum vulgare*. With time, however, this is replaced by species-poor coarse grassland and scrub. The scrub consists mainly of Willow *Salix* spp., Privet *Ligustrum vulgare* and Bramble *Rubus* spp. (Fitzgibbon *et al.* 2005) with some Spindle *Euonymus europaeus*, Dogwood *Cornus sanguinea* and an increasing amount of Birch *Betula pubescens*. Water uptake by the increasing quantity of scrub and trees may be, at least partly, responsible for the fall in the water table, resulting in the slacks becoming drier. However, there are also other possible causes such as climate change and water extraction on adjacent land. However, another effect of the dunes becoming more heavily vegetated has been the acidification of the sandy soil, as there is a noticeable increase of more acid loving plants such as Purple Moor-grass *Molinia caerulea* and Goldenrod *Solidago virgaurea*.

Grazing, which was resisted for some time, has recently been reintroduced at Braunton in order to counteract this increase in scrub and coarse grasses. Much of Northam Burrows is open and is currently grazed by sheep and ponies, which have access to most of the site, including the golf course. At both sites, substantial areas of scrub have been removed, including scraping down to the bare sand. Another concern is the arrival and increase of non-native species in recent years. Some of these have little or no adverse effect on the native flora but others have a greater impact and in the worst cases can aggressively invade the dunes out-competing native species. The most notorious of these is Sea Buckthorn *Hippophae rhamnoides*. Other fast spreading aliens include Japanese Rose *Rosa rugosa*, Confused Michaelmas-daisy *Aster novi-belgii*, Wall Cotoneaster *Cotoneaster horizontalis*, Red Valerian *Centranthus ruber* and Mexican Fleabane *Erigeron karvinskianus*. The long-standing introductions Sand Toadflax *Linaria arenaria* and Argentine Dock *Rumex frutescens* have persisted for many decades without having much impact on the native vegetation. Others that seem relatively benign are New Zealand Flax *Phormium tenax*, Hybrid Daisy-bush *Olearia × haastii* also from New Zealand, Purple Toadflax *Linaria purpurea* and Eastern Gladiolus *Gladiolus communis*, but this may not remain the case.

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