

These rear dune plants are less able to resist the advance of sand than true sand binders, but are able to produce the root systems necessary to ensure dune stability.

The more conspicuous plants of the moist sand hollows include jointed wire rush (*Leptocarpus similis*) which on its pedestal of roots and old leaf bases, may attain heights exceeding three metres; the northern pampas, (*Cortaderia splendens*), flax (*Phormium tenax*), knotted sedge (*Scirpus nodosus*), and the wire rush, *Eleocharis novae-zelandiae*.

Native animals of the dunes

The most diverse group of animals found on our natural dunelands are insects and spiders. Perhaps the best known is the katipo (*Latrodectus katipo*), one of our most poisonous spiders. Katipo are retiring creatures and may be found in dry places amongst driftwood or the tufts of sandbinding plants. Only the female is poisonous, and produces venom when she is incubating or rearing her offspring.

The sand dune hopper with its peculiar sand digging leg paddles, and the sand beetle with multi-speckled coat, are common inhabitants of the strand zone and seaward facing foredunes. They are both likely prey of the carnivorous beach centipede. They may also fall prey to the large native littoral earwig which is particularly common beneath driftwood along the strand.

Another common sand dweller is the nocturnal sand scarab beetle. The larvae resemble oversized huhu grubs, and spend most of their time buried in moist sand feeding on rotten driftwood, and the roots of pingao and spinifex. The adults have shiny armoured wings and are clothed below in golden downy bristles. They are weak fliers due to their sheer bulk, and at dusk their plaintive droning can often be heard across the dunes.

Moths and butterflies are also commonly encountered amongst the dunes. Some species of moth are entirely restricted to the dune environment. Spinifex, pingao, tauhinu and pohehue are important food sources for the larvae of both groups.

A number of native lizards range into sand dunes throughout the country, although none are restricted in distribution solely to dunes.

Our dunes support only a few native birds, unless they are adjacent to estuaries and lagoons and provide high tide roosts for a host of gulls and waders. The New Zealand pipit and banded dotterel often frequent the dunes, and can be seen racing along the strand line in search of sandhoppers and other morsels. The Australasian harrier is also a common dune resident and has been observed nesting amongst pingao. Dune country on spits and adjacent to river mouths, in Northland and Stewart Island, may sometimes support the rare New Zealand dotterel which breeds in this habitat.

Threats to our natural duneland

(a) Exotic conversion

When Europeans began colonizing New Zealand attempts were made to stock the more extensive dune country with sheep and cattle. The livestock grazed and

trampled the sparse vegetation cover. To control the resultant large scale dune erosion European marram grass was planted throughout the country, especially on the Manawatu and eastern South Island dunes. Eventually much duneland was stabilized by dense swards of marram and converted to pasture.

Extensive plantings of marram and tree lupin by the New Zealand Forest Service and private forestry companies have stabilized much natural duneland for pine plantations. Most of the Ninety Mile Beach dunes, dunes from Kaipara harbour to Muriwai, North Canterbury dunes and some of the Manawatu sand country have been stabilized and converted to exotics in this way.

Because of these plantings, marram has further spread both vegetatively and by seed to become the most widespread dune plant in New Zealand. It successfully competes with pingao and spinifex in most situations, and has supplanted much of the original vegetation.

Buffalo grass and kikuyu grass in the northern half of the North Island, gorse and lupin are also capable of stabilizing dunes and displacing the natural plant cover.

(b) Sand mining

To date, over 35 mining and dredging operations are extracting dune sand on Crown owned land, from South Westland to Northland. Many are extracting sand from natural dune systems such as those on Kaitorete Spit, Lake Ellesmere and Kokota Spit bordering Northland's Parengarenga Harbour. Although many of these operations are small, they are able to modify and in some cases destroy these dune systems over a relatively short period.

(c) Urban and recreational development

Most of the dune country close to major population centres has suffered from over-use. Reclamation of duneland for holiday houses, and damage incurred through horseriding, dune buggy and trail bike riding, have all contributed to the dunes demise.

Roading construction also poses a threat to some of our natural dunelands. The recent proposal to log Waitutu forest requires the construction of a coastal access road which would pass very close



to the pristine dune country at Sandhill Point.

(d) Introduced animals

Damage to our dunelands by stock has been largely unchecked. Even at Te Pahi Farm Park in the far north, which is managed by the Department of lands and Survey, cattle are allowed free access to otherwise unmodified dunescapes worthy of National Reserve status. At Spirits Bay cattle have almost eliminated the endangered Hibiscus (*H. diversifolius*) from the dunes — three plants now remain on these dunes.

Rabbits and hares are also frequent browsers of our duneland plants. Although much of the foliage of adult sandbinders is unpalatable to them, they create their own special problem in that they browse seedlings instead. Browsing pressure can be so high that seedlings never establish and sandbinders must rely on less effective vegetative spread.

The best known new Zealand spider, the katipo, is seldom seen. This shy animal is commonly found amongst dune vegetation. This female with her egg case was photographed at Waikanae beach near Wellington.



Photo: G. W. Gibbs