Ephemeral wetlands of dune slacks; how do their environmental relations structure their patterning?

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Abstract

Coastal dunes are found throughout New Zealand, and within these dunes are the ephemeral dune slack wetlands, which are classified as rare ecosystems. They are temporary environments, which become inundated during the wetter periods of the year. Dune slacks support a distinct biota of turf species, many of which are threatened and in need of protection.

Turf species are found in these ephemeral wetlands, to which their geographic distribution is primarily limited. 15 out of 33 potential wetland sites were sampled across New Zealand, and sites were chosen based on the presence of 3 or more ephemeral wetland species, so distribution and patterning of these wetland turf species could be investigated. The environmental variables thought to structure the distribution of these species were also examined. Ephemeral wetlands of dune slacks occur in three main zones throughout New Zealand. This is despite the occurrence of dune fields throughout the country.

Nutrients are thought to be added to the wetlands when fresh sand from the foredunes comes in and buries these turf species; thus the ability to survive burial delays the eventual succession of these dune slack sites. The turf species were tested to determine which environmental factors influence their growth in glasshouse experiments. Plant growth rates were assessed in response to burial X nutrient addition, to waterlogging X shade tolerance, and the impact of tamping on these species was also briefly assessed. The results show these species need access to a water table, which therefore has to be close to, or above the surface. However they are adapted to burial, with the experimental addition of nutrients allowing them to grow through partial levels of burial. They are not well adapted to low light situations, suggesting that they are poor competitors.

Turf species appear to be early successional species, as they occur in sites with low total species' numbers, and few exotics, they are poor competitors and are easily shaded out from a site. The main indicator of wetland decline appears to be the presence or absence of other (non-turf) species.

Ephemeral dune slack wetlands are a dynamic ecosystem. Management solutions need to be active and address these issues in order to maintain these sites and their flora. They contain threatened flora in need of protection, and a suite of unique environmental variables worthy of further study.

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