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

A thesis presented in fulfilment of the requirements for

Masters of Science

In

Ecology

At Massey University, Palmerston North, New Zealand.

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2015

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.

Acknowledgements

This research was funded by the George Mason Charitable trust, Heseltine bursary and Horizons Regional Council, Palmerston North.

Thanks to the Allan Herbaria, The Auckland Museum, Te Papa and the Massey Herbarium for providing previous collection locations of the turf species, to assist in site selection. Also thanks go to Horizons Regional council for helping me with maps for all possible sites.

For site access and help in the field I would like to thank the Taranaki Regional Council and Horizons Regional Council. Also thanks to the Department of Conservation in Kaitaia, Great Barrier Island, Farewell Spit and Invercargill for help contacting land owners and granting site access. I would also like to thank the O'Shea's who gave access to their farm on Great Barrier Island, Chris Petyt who came out on the farewell spit and assisted with field work, David Havell for assistance locating the KareKare and Whatipu sites, the Sextons for access to their property in Himatangi.

A humongous thanks goes to Jill Rapson, for her continued support throughout this process and her endless patience. As well as suggesting this project in the first place. Also thanks to Jill for giving up her valuable time to help in collecting the experimental plants and hauling buckets of sand out from the dunes into the ute.

I would like to thank my awesome assistants Dominic van den Heuvel and Alana Bensemman for keeping me sane throughout my fieldwork, and putting up with me for extended periods of time, (after being bribed with free travel around New Zealand). I would also like to thank Bex Ingram for her continued assistance in the glasshouse, couldn't have done it without you, on those awful Friday mornings. Thanks to Cleland Wallace for creating my tamping tools, and PGU for glasshouse space. Thanks go out to Massey University staff and students for collecting all my yoghurt pottles. Cheers to Pierce McNie for your statistics help, and big thanks goes out to the Department of Ecology post grad computer room occupants for keeping me sane, proof reading and continual coffee breaks throughout the writing process.

Lastly big thanks go out to Steven King for his continued support throughout this whole process, for putting up with stressed out me and for his assistance with all the proof reading and all the little things. And thanks to my Family couldn't have done it without you guys.

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