2016 BAY OF PLENTY SAND DUNE VEGETATION MAPPING AND CONDITION ASSESSMENT

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R2033a

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CONTENTS

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1. INTRODUCTION

Sand dunes are a prominent feature of the Bay of Plenty coastline. The area of active dunes in the Bay of Plenty has declined significantly from *c.*1,692 hectares in the 1950s to *c.*928 hectares in the 1990s (Hilton 2006). Reasons for this decline include coastal development, erosion, and invasion of exotic species. Community and council-led care-groups are taking action to restore the natural character of the sand dune vegetation and habitats within the Bay of Plenty.

Bay of Plenty Regional Council commissioned Wildland Consultants to undertake mapping of vegetation and an assessment of condition in "wild undeveloped" areas on sand dunes between Orokawa Bay (Waihī Beach) and Ōtamarākau. Sand dune vegetation and habitats were first surveyed using transects and mapped in 2008-2009 (Wildland Consultants 2008a). In 2016, 53 of the 83 transects along this stretch of coastline were remeasured and the area remapped. The remaining 30 transects, all on Matakana Island (SDVC-003 to SDVC-008), were not measured during this survey as landowner access could not be provided within the project's timeframe.

Information on the composition of vegetation units and the cover abundance of exotic species present within those units, as well as condition and impact factors associated with all vegetation units were collected from each of the measured transects. The 2016 remeasurements of the transects and remapping of vegetation units will be used to determine change in vegetation cover and condition of the Bay of Plenty coastal dune system.

Methods that were used for identifying and mapping dune vegetation types, and assessing dune condition were based on those described previously (Wildland Consultants 2008b). This report presents the methods used during the 2016 field survey, identifies any issues encountered during the project, and provides recommendations for future field work.

2. METHODS

Methods used in 2016 were based on those described by Wildland Consultants (2008b). In 2008, 'Wild undeveloped areas' along the coastline between Orokawa Bay (Waihī Beach) and Ōtamarākau were identified and assigned a "Sand Dune Vegetation Mapping and Condition assessment site" (SDVC) number (e.g. Pukehina Spit: SDVC-018), ordered west to east along the Bay of Plenty coastline. Twenty-two sites were identified.

Belt transects were also established at one kilometre intervals along the coastline between Orokawa Bay (Waihī Beach) and Ōtamarākau. Belt transects extended from the strand line to the inland end of the wild undeveloped dune system, at managed margins or a change in landform. At Bowentown Dunes (SDVC-002) the belt transect crossed the road and continued on the wild undeveloped dune system up to the estuary margin. Eighty-three transects were established. Most of the SDVC sites were bisected by more than one transect. Additional transects were located as required to ensure that at least one transect bisected each SDVC site and all vegetation types greater than one hectare within each SDVC site were traversed by at least one

transect. Transects were assigned numbers reflecting their distance from the most north western transect. Additional transects were identified with a subsidiary number (for example SDV-096.1).

In 2016, 53 transects at 16 sites were remeasured and mapped. The remaining 30 transects, all on Matakana Island (SDVC-003 to SDVC-008), were not measured during this survey. The methods used in 2016 are summarised below:

- A walk through survey of all dune vegetation at each SDVC site was conducted.
- Site Sheets were completed for each SDVC site and included: a description of each mapped vegetation type; cover of weed species and threatened or significant plants; and impacts to the site. Cover classes were updated from those used in 2008 to provide greater accuracy. The new classes used were 1 = <1-1%; 5 = 2-5%; 10 = 6-10%; 15 = 11-15%; 20 = 16-20% and so forth.
- In the field, changes to the 2008 vegetation map were drawn onto printed copies of the 2015 aerial photographs at a scale of 1:1000. After fieldwork, maps were digitised at a scale of 1:1000 and saved as GIS shape files. Any 'wild areas' that were missed during the 2008-2009 survey or that have established since then were included and identified as 'new 2016', or 'missed 2008' in the GIS files. Areas that were 'wild areas' in 2008, but were found to be managed or developed in 2016 were excluded from the 2016 maps.
- GPS waypoint data were used to identify the seaward and inland end of each belt transect.
- Fifty-three belt transects along the Bay of Plenty coastline between Orokawa Bay (Waihī Beach) and Ōtamarākau were mapped (at a scale of 1:1,000) and described. For each belt transect, a Transect Sheet was completed, and a Vegetation Unit Condition Assessment Sheet was completed for each vegetation unit identified within each transect. Transect Sheets were used to record the GPS location at both ends of the transect, record the photograph numbers taken at each end of the transect, and describe the transect and its management priorities. The relative cover of exotic plants, relative cover of indigenous plants, relative cover of bare sand (where applicable), any changes since the previous survey, threatened or significant plants, and impacts in each unit were recorded on the Vegetation Unit Condition Assessment Sheets. Details of any occurences of four key threatened and significant plant species (*Poa billardierei*, *Kunzea toelkenii*, *Pimelea villosa* and *Tetragonia tetragonioides*), including GPS points and photograph numbers, were recorded on the Transect Sheets. An estimate of the percentage cover of a further 15 key species - *Calystegia soldanella*, *Carex pumila*, *Carex testacea*, *Coprosma acerosa*, *Coprosma repens*, *Dodonea viscosa*, *Euphorbia glauca*, *Ficinia spiralis*, *Lachnagrostis billardierei*, *Melicytus novae-zelandiae*, *Metrosideros excelsa*, *Myoporum laetum*, *Oxalis rubens*, *Ozothamnus leptophylla*, *Zoysia pauciflora* - was made within each Unit within a transect, and also within each site.
- Photographs were taken of each transect from 1.70 metres above ground level. One photograph was taken at the seaward end of the transect facing inland, down the transect line. In most cases, two additional photographs were taken from the

seaward end of the transect, facing inland, and offset at 45° either side of the transect line. Three photographs were taken at the inland end of the transect, facing the ocean. One of these was taken down the transect line and the other two were taken offset at 45° either side of the transect line. Where these photographs did not adequately replicate the 2008-2009 photographs (and GPS locations), additional photographs were taken to replicate the 2008-2009 photographs. Additional photographs were taken facing inland and seaward (centre, left 45°, right 45°) at locations were the transect crossed a modified structure (such as at Bowentown Dunes: SDVC-002).

- This work was undertaken by Wildland Consultants staff in conjunction with Regional Council staff.

3. LOCATION OF DATA

Completed original Site Sheets, Transect Sheets and Vegetation Unit Condition Assessment Sheets (collated by site, in order of site number) were scanned and provided in digital format to the Council. Hard copy sheets will also be provided to Council following data entry. GIS shape files for the digitised vegetation maps were provided to the Council. Photographs taken for each site/transect were labelled with site/transect name and number, and provided to the Council in digital format.

4. ISSUES EXPERIENCED

No health and safety issues were experienced.

5. FUTURE REMEASUREMENTS

Remeasurement of the vegetation mapping and sand dune monitoring transects between Orokawa Bay (Waihī Beach) and Ōtamarākau should be undertaken every eight to ten years, and should ideally be timed to coincide with the availability of up-to-date aerial photographs. This will provide an understanding of changes in distribution of weeds and an indicator of the effectiveness of management activities over time.

The current survey was conducted between April and May, with a few days in the field in February to refine methodology. Late March-early May is ideal timing for field work as the weather is generally relatively stable and cooler at this time. It is recommended that future fieldwork on sand dunes is carried out during this time frame to improve replicability and minimise the duration of time that fieldworkers are exposed to high temperatures and high levels of UV light.

The table for recording details about any occurrences of the four key threatened and significant plant species was added to the Transect Sheet in 2016. This table would be better placed on the Site Sheet because it was used to record these species wherever they occurred within a site (rather than only in a given transect).

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Shay Dean (Bay of Plenty Regional Council) instigated this project and provided logistical support. Lisa Bevan (Bay of Plenty Regional Council) assisted with fieldwork.

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