BOTANY DIVISION DSIR

REPORT

WAITUNA LAGOON RESERVE : BOTANICAL REPORT ON GULL COLONY, BOG VEGETATION, LAGOON MARGIN

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SUMMARY

Monitoring of a gull colony upon cushion bog near the coast in Waituna Scientific Rserve indicates continuing weed infestation and nutrient enrichment. This area of Donatia cushion bog, unique as an example of alpine vegetation at sea level, is the botanical highlight of this wetland, it is limited in extent, and is diminishing also as a result of fire and shrub enroachment. It is recommended that the gull colony be encouraged or forced off this site. Examples of vegetation processes on bog surfaces are described. Monitoring needs for Waituna lagoon margins are discussed.

INTRODUCTION

Waituna Scientific Reserve was visited in April 1986, the lagoon itself on the 25th and coastal cushion bog at its west end on the 26th, in the company of Wynston Cooper (Lands & Survey Dept), Gordon Watson and Dave McNaughton of Invercargill, and Otago University botanists Alan Mark, Stephan Halloy, Brian Rance and Kath Dickinson.

This report describes several aspects of the vegetation and outlines some of the points raised in discussions by the group concerning management of the vegetation.

GULL ROOST SITE

Since November 1984 when vegetation of the gull colony at S.182/532798 was first described, 5 photo points have been monitored by Wynston Cooper. On cushion bog then in undamaged state, (photo points 1 & 2) no gull-induced changes are obvious, though comparison of some earlier (1981) photos with later ones shows some dieback, probably from salty winds, of 0.4 m tall manuka and inaka shrubs on their seaward side. Photo points 3 and 5, of sites where gulls have roosted show marked changes, especially the colonistation of bare mud by Marchantia, the replacement of a low induced cover of Poa annua by

Holcus lanatus, by rushes of Juncus gregiflorus and J. effusus which rapidly grew to maturity, and of Carex virgata which was not noted here in December 1984. To the three stages of re-vegetation previously described can be added a fourth, as now evident within 5 m of photo point 3: Juncus gregiflorus 10% cover, Holcus lanatus 15%, Senecio glomeratus 15%, Stellaria alsine 15%, Hydrocotyle 'montana' 5%, Poa annua 5%, Juncus articulatus 5%, Carex virgata 5%, and Cotula coronopifolia 15% (this having arrived on site since 1984). Carex virgata (not noted in 1984) has increased to 30% cover at photo point 5, sharing dominance with Holcus 30%, Juncus gregiflorus 30% and J. effusus 10%.

These overgrown sites seem not to have been used for gull nest sites over the last season, which means that the gull colony (estimated by W. Cooper to have increased to 400 birds this summer) must be spreading onto new ground locally.

Observations and discussions by our party on 26 April 1986 led to the following conclusions:

1. That cushion bog with Donatia, Oreobolus and other usually alpine plants is the botanical highlight of the Waituna and Awarua Wetlands.

2. That cushion bog seems quite local over this whole bog system, and appears to be decreasing because of fire, invasion by shrubs and wire rush and possibly other factors.

3. That the cushion bogs of particular interest because they are right by the sea are limited to the bog frontage immediately west of the west end of Waituna Lagoon, and that it is precisely this site which the gulls have colonised.

4. This coastal edge cushion bog is of added value because of its easy access.

5. That black-backed gulls have the ability to totally destroy cushion vegetation, and lead to massive weed infestation and soil enrichment.

6. That the gulls be discouraged from continuing to use this site by whatever means are suitable.

VEGETATION PROCESSES

In the context of trying to understand successional processes in bog vegetation, descriptions were made at two sites lying behind the gull colony area:

(a) An old beach ridge, some 200 m wide, runs NW from the western coastal extemity of Waituna Lagoon. This ridge may have lain above the coastline at a time when Awarua Bay was not completely enclosed by Tiwai Peninsula. At S.182/528810 1.8 m tall dead stems indicate a previous cover of manuka scrub. The largest existing shrubs were of size and age (from basal ring counts) as follows:

	height (m)	basal diameter (cm)	age (years)
Leptospermum scoparium	0.9 m	1.8	7
Dracophyllum longifolium	1.1 m	1.5	9
Coprosma parviflora	1.2 m	3.1	8
Cassinia vauvilliersii	0.7 m	1.3	6

Taking the oldest stem at 9 years as the age of this vegetation since the last fire, its composition is: manuka 0.7 to 0.9 m tall 50% cover, Dracophyllum to 1.1 m tall 8%, among a lower (0.1 to 0.3 m) cover of Lepidosperma australe (5%) Cyathodes empetrifolia (15%), Pentachondra pumila (5%), Empodisma minus (15%). There are scattered shrubs of Coprosma parviflora and Cyathodes juniperina. Other low plants are Gonocarpus micranthus, Pernettya macrostigma, Celmisia gracilenta, Herpolirion novae-zelandiae, Rytidosperma sp., Thelymitra sp, Hypochoeris radicata, and Cladonia spp.

This vegetation is not so much bog vegetation as heathland, growing on firm ground with a thin peat cover over gravels.

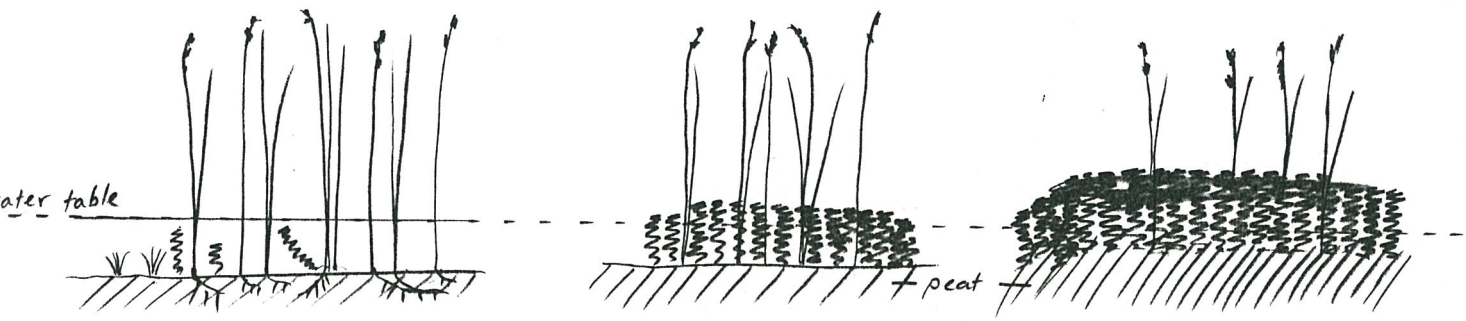
(b) A swampy flat lying seaward of the ridge at (a), and traversed by an old water race apparently built up for a gold mining venture on the beach, has a mosaic of vegetation types, which are tentatively interpreted in Fig 1 as a cyclical succession.

WAITUNA LAGOON EDGE

It has been intended to establish permanent transects on the shores of Waituna Lagoon in order to monitor changes resultant upon the way the lagoon levels are managed. Unfortunately, at the time of our visit (24.4.86) the lagoon was at a level (1.68 m on the Currans Ck staff gauge) where marginal Leptocarpus rushland was flooded, making careful shoreline surveys of ground levels and plant ranges impossible.

Of concern to several agencies and people is the establishment of gorse around the lagoon edges, possibly encouraged by lower water tables because the lagoon is not allowed reach the maximum levels it would have attained before the practice of artificial breaching of the coastal gravel bar.

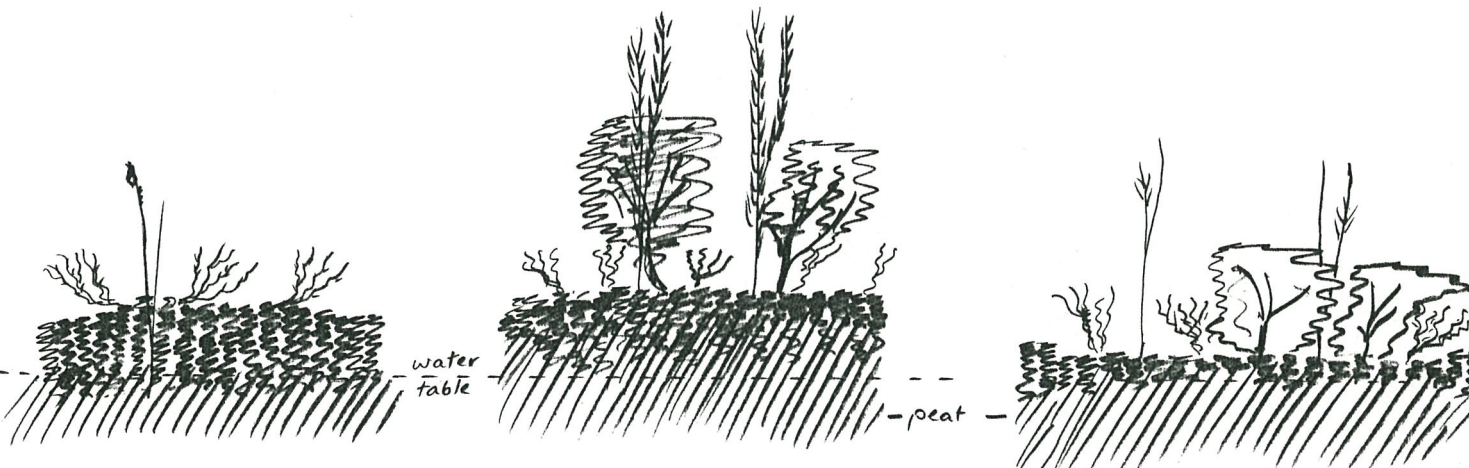
The practice of opening the bar once water level reaches 2.0 m on the gauge, or when the level has been above 1.8 m for over two months, has been determined primarily by the pressures of adjacent landowners for maintaining drainage off farmland. There has been no input to this practice from biologists. In order to better understand the ecological needs of the lagoon margin in comparison with drainage needs of farms, it would be useful to inspect the margins and drainage flows at a time when the level is high. There is a need also to commence recording of lagoon levels by automatic gauge to build up a sound baseline of hydrological data, and to establish water table recorders also on the bog surface.



1. Baumea huttonii emergent from water 10 cm deep; aquatic Scirpus sulcatus and Sphagnum falcatulum

2. Sphagnum cristatum among Baumea

3. Sphagnum cristatum soft cushions reach above water table



4. Firmer cushions of Sphagnum cristatum colonised by wire rush (Empodisma)

5. Wire rush with low shrubs of manuka and Dracophyllum

6. late stage – water table has risen relatively: Dracophyllum dies, manuka becomes moribund. If ponding occurs, return to 1.

FIG 1. Waituna Lagoon Reserve: tentative succession of vegetation types on low lying wet part of bog surface.