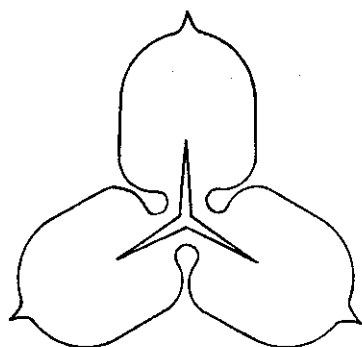


BOTANY DIVISION DSIR



REPORT

PROPOSAL FOR A WETLAND RESERVE ADJACENT TO THE WAITUNA
LAGOON, TOETOE BAY, SOUTHLAND

G.C. KELLY
BOTANY DIVISION, DSIR

JUNE 1967

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Christchurch

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SUMMARY

A wetland reserve on the seaward side of the Waituna Lagoon is proposed. The size would be at least 500 acres, but an additional area is also suggested for consideration, since it may be unsuited to land development. The difficulties of preserving peat are mentioned, and the need for reservation based on biologically sound criteria is stressed. The vegetation of peat, lagoon, and coast is described; altogether more than 150 species of native plants are found in the proposed area, the largest being small shrubs. The peat vegetation is of great interest, for many plants normally montane to subalpine are found here at sealevel.

Plant Communities

stunted rimu forest
manuka scrub
manuka - Dracophyllum scrub
tarns
Donatia cushion bog (with sphagnum, etc., in places)
seacoast and sand communities
Hypolaëna - Gleichenia
Dense Leptocarpus on lagoon edge
turf communities (Selliera etc.)

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ON PRESERVING WETLAND

A peatland dominated by any one species is very difficult to preserve in perpetuity, for changes in adjacent drainage alter to a greater or lesser degree the delicate water relationships of the key species, and this usually means that the competitive advantage of that plant is reduced, and something else takes over. To preserve such communities we have to preserve the whole peat forming environment, and thus the whole habitat of the organism; this cannot be achieved by putting a fence around an arbitrarily selected 'good sample'. In general, a peat reserve must have natural boundaries, and it must be as large as possible. In this way it is more likely to include the small scale variation in topography which allows the several species present to sort themselves into their various communities and also it is better able to withstand short term cycles of dry weather. A run of summers like the one just experienced in Southland could seriously affect a small "uninsulated" reserve.

But peatland does not appeal to everyone, so if a reserve can serve several useful functions compatible with the objects of the reserve, so much the better. In this case botanists and pedologists want to preserve a wet peat environment for a unique vegetation in unusual maritime soil-forming conditions, and the locality chosen includes many peat tarns and extensive lagoon margins. It also provides a home and habitat to game waterfowl; this is good, for a larger area can be justified for preservation, thus giving both bird and plant populations more chance of surviving for centuries. Under natural conditions we cannot preserve "a bird" or "a plant", but we can with care preserve the organism's habitat, and only then the organism itself.

At present such a situation raises difficulties, for reservation and duck shooting are not compatible according to the Act. However, this is more an administrative difficulty; and issues such as this should be considered on biological criteria as well as administrative ones. In this case there is nothing to be gained by excluding duck-shooters and banning duck shooting, and in fact, there is much to be lost, both in goodwill and in the chances of long-term preservation which a larger area offers. (The views of the Wildlife Service, Department of Internal Affairs, Wellington, should also be sought on this; they have received this report).

The only precaution which should be taken is to erect notices at the north, east, and west end setting out the purpose of a wetland reserve, pointing out that firing and drainage destroy the habitat and thus both the birds and the plants dependent on it.

INTRODUCTION

For some time the Ecological Society of New Zealand, Professor Baylis of Otago University, the Lands and Survey Department, Invercargill, and other interested parties have agreed on the desirability of reserving a sample of the remarkable Awarua Bog as Dr L.M. Cranwell once described it, and particularly Donatia cushion bog. However, siting this reserve has been difficult, so in March of this year I made a very brief visit to the area. Lands and Survey had indicated that the remainder of Block 14 (several thousand acres) of the Oteremaika Hundred was available for the placing of the reserve, and in addition in discussion with the Lands Office I found that parts of Block 15 were vacant Crown Land. This is fortunate for the land within Block 14 is unlikely to be suitable for perpetuating the wet peat environment. In contrast, parts of Block 15 are biologically most appealing.

GENERAL DESCRIPTION

The low lying southeast corner of Southland is an Ice Age to post-Ice Age outwash plain of mainly quartz river gravels building out from the old Mesozoic greywackes to the north. The gravels are somewhat sheltered from marine erosion by the Bluff-Ruapuke ancient volcanic intrusives to the southwest. Longshore drift and accumulation has over a long stretch of time built bars and beach ridges in front of the advancing gravel, and this has led to ponding and grossly impeded drainage on the alluvial plain, for the whole area is very flat. A thick blanket of peat has slowly developed under the prevailing conditions of low equable temperatures, regular rain, and frequently overcast skies, and this peat now covers most of the land behind Toetoes Bay, and extends for some miles inland.

A unique vegetation has developed, in which only plants adapted to cold peaty conditions can survive; consequently the flora contains many montane to subalpine species growing here almost at sealevel, plants which in the North Island only grow above 3000 feet, where present at all. The number of species characteristic of the original deep peat is small (Appendix), for the medium is acidic and poor in nutrients.

The primitive plant covering on the peat varied with the surface relief and drainage, the two extremes being peat tarns and stunted rimu forest, and in between vast areas of open moor vegetation, much of which was sphagnum and Donatia. Small variations in regional climate can profoundly affect such peat bogs: for example in a prolonged dry spell some thousands of years ago virtually the whole Awarua area became covered with tallmanuka, and then as wetter conditions returned the bog vegetation enveloped these small trees as they stood, and their trunks and roots can be seen by the hundreds around parts of Waituna Bay Lagoon.

A mosaic of peat vegetation once existed on Block 14, and one day was spent tramping over the area. The remnants of the cushion bog community can still be found, but there is virtually no area where manuka seedlings are not established. The repeated firing and encroaching

drainage and development will continue the trends now well in train, and it seems most unlikely that any part of it will be able to preserve the bog-peat environment 100 years hence. The subalpine Donatia cushion bog community, which is the most noteworthy feature of the Awarua Plains, depends on a very delicate water balance; when healthy it is water-saturated but not water-logged, and it must never dry out. The plants cannot be protected without preserving a large area of the soil-water-table-drainage complex they live in.

A second day was spent on Block 15, and the area Marked A on the map was found to offer nearly everything that could be expected for a peat bog reserve, and to have many other interesting features as well. It is not sand as shown on the 1 mile topo., but is mainly peat on gravel; it is virtually surrounded by water of a more or less constant level, and thus it cannot be affected by drainage. Though not immune from fires lit on the spot, it is protected from fires spreading from adjacent areas. Further, it is unlikely to be affected by drift from topdressing or spray. Thus virtually all the problems of a mainland reserve are overcome. As time was limited only the very edges were inspected, and most of the information has been gleaned by aerial examination and aerial photos. The area includes 4 more or less distinct vegetation groups, and a surprising wealth of species, considering that to casual inspection it appears to be what might popularly be called a peat-swamp waste land.

I cannot claim that this area includes the very best example of Donatia bog surviving - probably the best samples of that are still to be found east of the Awarua Bay Rd (one possible location is marked on the sketch map). However, it is likely that the area chosen offers the best opportunity to preserve some kind of example, for all the species are there. Examination of the interior should reveal good samples, particularly near to the tarns. There is no doubt that many interesting botanical discoveries remain to be made in the general area; several new records came from this very short visit. This adds weight to the need for a reserve, for this vegetation is not found elsewhere on the mainland.

VEGETATION

1. Peat

Cushion bog is the prime reason for having a reserve here, for it "had as its dominant species Donatia novae-zelandiae, a species elsewhere restricted to subalpine bogs. In this association the subalpine element was strongly represented the occurrence here in quantity of Herpolirion novae-zelandiae, Oreostylidium subulatum, Oreobolus pectinatus, Carpha alpina, and many other species elsewhere montane and subalpine gave these bogs a unique character" (Martin, 1960).

The vegetation of the open areas does vary considerably. There are several aquatic species (e.g. Utricularia) recorded by Crosby-Smith from standing water, then in shallower tarns Cladium huttonii

(a northern species not previously recorded in the South Island except on the west coast) is quite common. Wet concave places more or less above free groundwater level have several species of Sphagnum, and the cushion plants Gaimardia and Oreobolus, together with Schoenus pauciflorus and the wire-rush Hypolaena. In some parts there is umbrella fern, and on bare peat a variety of species including Drosera spathulata, Pernettya nana, Gaimardia, Carpha, Schizaea, Herpolirion, Lycopodium ramulosum, Hemiphues, Nertera scapanioides and Nertera balfouriana. Where the peat is always wet but unlikely to be submerged Donatia bog is developed, together with many of the species listed 'P' in the Appendix. Hypolaena and Gleichenia may be prominent, especially in slightly drier parts. The huge green hummocks of Donatia are exceedingly interesting and attractive, and upon their edges several montane species grow - Pentachondra is characteristic.

With a slight increase in elevation and aeration of the undulating peat, several larger shrubby plants appear, including Dracophyllum longifolium (and red tussock on the plains to the north) and an attractive boggy shrubland results. An alternative community on the somewhat drier ground is a dense sward of Hypolaena and Gleichenia, but this may be fire induced.

At about this point in the NATURAL system manuka is able to compete, and an open manuka-Dracophyllum scrub with many bog species surviving below is quite common on suitable parts of area A. This phase lasts a long time, and with continued litter accumulation other species of shrubs and trees would enter, to ultimately form the rimu dominated stunted coastal forest typical of the area.

With repeated firing this system breaks down, for each time the plants are burnt the top of the peat is scorched and damaged. In conjunction with even slight drainage, conditions are so greatly altered that in the end, manuka is able to establish as a first coloniser on the peat crust, and the other more usual peat species are crowded out. Soon vast areas come to be dominated entirely by manuka, where formerly a much more interesting vegetation prevailed.

The proposed area A has probably not been burnt so much as the mainland, and all stages of natural vegetation up to manuka and Dracophyllum are present. Area B is rather different in that it has been cleared at some stage for farming, and now the native plants are reinvading it. At present there is a predominance of turf forming herbs (Appendix) on the peaty area. Area C has good bog vegetation. and all stages up to large areas of fire-induced dense manuka.

2. Lagoon Edge

Two communities are prominent. The jointed rush Leptocarpus dominates considerable areas just above average water level, and may form vast stands in abandoned water channels and embayments. Associated species are few, for the growth of the Leptocarpus is so dense, but despite this. the community is attractive because of the colour and texture of the plant. A second and more interesting vegetation is found along the strand area which is from time to time inundated. It is composed entirely

of very small herbs, and altogether 24 species were seen, none more than an inch or so tall. Careful examination would reveal more, but even so, the rare Schizeilema cockaynei was found to be abundant in some places, and one of the commonest turf plants, Schoenus nitens var. concinus turns out to be a new record for Southland. The various species tend to arrange themselves into groups according to salinity and substrate particle size, the most interesting being on the firm silt in the bay-heads where large flowered Euphrasia repens, the Schizeilema, Plantago triandra and the little Schoenus form a dense turf.

3. Seashore and Sand

The large white flowered Gentiana saxosa is the most spectacular feature of the coastal vegetation, and in places where the peat is cliffed by the sea to form a low shelf the top is covered with a dense turf of this plant and Selliera. The proposed reserve provides an excellent opportunity to preserve a large area of this unique lowland large-flowered gentian.

The seashore also has the usual coastal plants like Scirpus nodosus, sand convolvulus Calystegia, coastal tussock Poa triodioides, Ranunculus acaulis, prostrate pimeleas, and abundant Selliera which is in places acting as a sand binder and extends further into the salt spray than any other species. On the lee side of the spit, especially in area B, there are large areas of Apium australe and Salicornia forming an unusual hummocky vegetation giving about 50% cover in fine gravel. Interesting features of the sand ridge include rare pingao (which is very rare in Southland), 2 species of mat-daisy (Raoulia glabra which is usually an inland species, and a var. of R. hookeri) and possibly a third one equivalent to the one recognised by Cockayne as R. beauverdii in 1914. Also there is Muehlenbeckia axillaris (usually inland, I have never seen it by the sea before), and a kind of sandbinding Hydrocotyle microphylla which may be a new race, together with the attractive southern sea shore forgetmenot Myosotis pygmaea var. pygmaea and the small blue leaved coastal Geranium sessiliflorum var. arenarium.

Altogether the coastal herbs are a most striking feature of the area, and form a distinct assemblage not found north of Southland.

4. Turf Communities

Along the tracks between the peat and the shore, and over much of area B where an attempt at farming has been made, there are turf communities. These are a mixture of many kinds of plants depending mainly on whether the soil is peaty or sandy. There are quite large patches similar to the lagoon turf, but with peat species added - Pernettya, Viola, Schoenus pauciflorus etc., as well as a number of plants more or less confined to these areas - silver tussock, the new Bluff variety of Carex comans, Potentilla, Juncus spp., as listed in the Appendix.

BIRDS

The area and its environs are primarily waterfowl habitat, and species present include ducks, black oystercatchers, pied stilts, and shags. Other birds noticed were pipits, grey warblers and a variety of seabirds. Fernbirds could perhaps be expected, though none were seen.

AREA OF RESERVE

It is recommended that the whole of area A (sketch map) be the centre and most important part of the reserve. This includes all the peat communities, all the lagoon edge communities, and parts of the coastal and turf communities. Preferably the whole of area B should also be added, so that the centre is protected on either side by shingle spits. This would add a better selection of coastal vegetation, plus a large area of mainly native turf, apart from the introduced trees, shrubs, and weeds, like gorse and blackberry around the old buildings.

The area C is essentially peat communities, much of which has been degraded by repeated burning to produce vast areas of manuka, but there are good Donatia bogs. Around the edges there are extensive Leptocarpus stands and much excellent waterbird habitat. The area is riddled with tarns, two of which are really large, and it may well be that it is considered marginal or useless for land development. If this is so area C should be added to the reserve without hesitation, for in addition to its botanical interest it will become increasingly useful for waterfowl, and in 100 or 200 years, large areas of wild wetland will be hard to come by.

For any wetland reserve in this area, every effort must be made by education, informative notices etc., to prevent the firing and draining which surely destroy the peat environment, together with its plants and birds.

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APPENDIX: HIGHER PLANTS (FERNS, FERN ALLIES AND FLOWERING PLANTS) NATIVE TO THE AREA.

N.B. This list is not a complete flora for the proposed reserve.

P usually on deep peat

L lagoon edge

S seashore

T tracks and "pasture"

underlining montane to subalpine species not usually found at sea level

T	<i>Acaena microphylla</i>	bidibidi
T	<i>A. novae-zelandiae</i>	"
T	<i>A. mic. X n-z hybrids</i>	
L	<i>Agrostis pallescens</i>	grass
S	<i>Apium australe</i>	native celery
P	<i>Blechnum capense</i>	fern
P	<i>B. minus</i>	fern
P	<i>B. pennamarina</i>	fern
S	<i>Calystegia soldanella</i>	sand convolvulus
S,T	<i>Carex comans</i> var. "Bluff Hill"	sedge
P	<i>C. coriacea</i>	"
S,T	<i>C. lucida</i>	"
S	<i>C. pumila</i>	"
P	<i>C. secta</i>	"
P	<u><i>Carpha alpina</i></u>	
P	<i>Cassinia fulvida</i>	tauhinu
P,T	<i>Celmisia gracilentia</i>	daisy
T	<i>Centella uniflora</i>	
S,L	<i>Chenopodium ambiguum</i>	
P	<i>Chionochloa rubra</i>	red tussock
P	<i>Cladium glomeratum</i>	sedge
L	<i>C. gunnii</i>	"
P	<i>C. huttonii</i>	"
S	<i>Colobanthus muelleri</i>	
S	<i>Coprosma propinqua</i>	
P	<i>C. rugosa</i>	
P,L	<i>Cortaderia richardii</i>	toitoi
L	<i>Cotula coronopifolia</i>	bachelors button
L,T	<i>C. sp. (dioica ?)</i>	
L	<i>C. sp.</i>	
P	<i>Cyathodes empetrifolia</i>	
P,T	<i>C. fraseri</i>	
P	<i>C. juniperina</i>	prickly mingimingi
S	<i>Desmoschoenus spiralis</i> (rare)	pingao
P	<i>Dianella intermedia</i>	
P	<u><i>Donatia novae-zelandiae</i></u>	
P	<i>Dracophyllum longifolium</i>	inaka
P	<i>Drosera binata</i>	sundew
P	<i>D. spathulata</i>	sundew

L	<i>Eleocharis gracilis</i>	
P	<i>E. sphacelata</i>	
S	<i>Epilobium</i> sp. (sandy shore)	willow herb
P,T	<i>E.</i> sp. (peat)	" "
S,P	<i>Erechtites minima</i> var. <i>angustata</i>	daisy
P	<u><i>Euphrasia dyeri</i></u>	
L,T	<i>E. repens</i>	
P	<u><i>Gaimardia ciliata</i></u> (lowland in Westland pakihi)	
P,T	<i>Gentiana grisebachii</i>	
P	<u><i>G. lineata</i></u>	
S	<i>G. saxosa</i>	
S	<i>Geranium sessiliflorum</i> var. <i>arenarium</i>	
P	<i>Gleichenia circinata</i>	fern
L	<i>Glossostigma elatinoides</i>	
S,T	<i>Gnaphalium luteo-album</i>	cudweed
P,T	<i>Gunnera prorepens</i>	
T,L	<i>Haloragis depressa</i>	
T,P	<i>H. micrantha</i>	
T,S	<i>Helichrysum filicaule</i>	daisy
P	<i>Hemiphysalis suffocata</i>	
P	<i>Herpolirion novae-zelandiae</i>	
P	<i>Hierochloa redolens</i> (s.s.)	holy grass
L	<i>Hydrocotyle tripartita</i> var. <i>hydrophila</i>	
S	<i>H.</i> sp. of coastal gravels (glossy leaved, fleshy, running, similar oversize <i>H. microphylla</i>)	
P	<i>Hypolaena lateriflora</i>	wire rush
P	<i>Juncus antarcticus</i>	rush
T	<i>J. pallidus</i>	"
T	<i>J. pauciflorus</i>	"
P	<i>J. planifolius</i>	"
T	<i>J. sp.</i>	
L	<u><i>Lachnagrostis striata</i></u> (Ch: <i>Deyeuxia</i> <i>forsteri</i> var. <i>humilior</i>)	grass
T	<i>Lagenophora pumila</i>	daisy
P	<i>Lepidosperma australe</i>	sedge
L,S	<i>Leptocarpus simplex</i>	"
P,T	<i>Leptospermum scoparium</i>	manuka, teatree
S,T	<i>Libertia peregrinans</i>	
L,T	<i>Lilaeopsis novae-zelandiae</i>	
L	<i>Limosella lineata</i>	
P	<i>Lycopodium ramulosum</i>	
T	<i>Mazus radicans</i>	
T	<i>Mentha cunninghamii</i>	native peppermint
S	<u><i>Muehlenbeckia axillaris</i></u>	creeping pohuehue
S	<i>Myosotis pygmaea</i> var. <i>pygmaea</i>	native forgetmenot
L,T	<i>Myriophyllum pedunculatum</i>	
L	<i>M. propinquum</i>	

P	<i>Nertera balfouriana</i>	
T	<i>N. depressa</i>	
P	<i>N. scapanioides</i>	
P	<i>Oreobolus pectinatus</i>	combsedge
P	<i>O. strictus</i>	
T	<i>Oreomyrrhis colensoi</i>	
P	<i>Oreostylidium subulatum</i>	
P	<i>Pentachondra pumila</i>	
P	<i>Pernettya macrostigma</i>	
P	<i>Phormium tenax</i>	flax
S	<i>Pimelea prostrata</i> (hairy & glabrous races)	
T	<i>Plantago raoulii</i>	plantain
L,T	<i>P. triandra</i>	
S	<i>Poa caespitosa</i>	silver tussock
S	<i>P. triodioides</i>	coastal tussock
T,L	<i>Potentilla anserinoides</i>	
P	<i>Prasophyllum colensoi</i>	orchid
T	<i>Pratia angulata</i>	
P,T	<i>Pteridium aquilinum</i>	bracken
S	<i>Ranunculus acaulis</i>	buttercup
S	<i>Raoulia glabra</i>	mat daisy
S	<i>R. hookeri</i>	"
S	<i>R. sp.</i> ("beauverdii" ?)	"
L	<i>Ruppia maritima</i>	
S	<i>Salicornia australis</i>	
S,L,T	<i>Samolus repens</i>	
P	<i>Schizaea fistulosa</i>	
L,T	<i>Schizeilema cockaynei</i>	
L,T	<i>Schoenus nitens</i> var. <i>concinus</i>	sedge
P	<i>S. pauciflorus</i>	"
L	<i>Scirpus aucklandicus</i>	"
L	<i>S. basalaris</i>	"
L,T	<i>S. cernuus</i>	"
S,L	<i>S. nodosus</i>	"
P	<i>S. sulcatus</i> var. <i>distigmata</i>	"
S,L,T	<i>Selliera radicans</i>	
P,T	<i>Thelymitra longifolia</i>	orchid
P	<i>T. sp.</i> (<i>pulchella</i> ?)	"
P	<i>T. venosa</i>	"
S,L,T	<i>Tillaea moschata</i>	
S,L,T	<i>Triglochin striatum</i>	
T	<i>Uncinia sylvestris</i> var. <i>squamata</i>	hookgrass
T	<i>Viola cunninghamii</i>	violet

The following plants characteristic of the Awarua peat (Crosby-Smith) were not noticed in the short time available: *Astelia nervosa* (*cockaynei*), *Cassinia vauvilliersii*, *Cyathodes pumila*, *Elatine gratioloides*, *Gaultheria depressa*, *Gunnera albocarpa*, *Microlaena thompsonii*, *Montia fontana*, *Notodanthonia sp.*, *Utricularia monanthos*, *Viola filicaulis*.

Supplement to

PROPOSAL FOR A WETLAND RESERVE ADJACENT TO THE WAITUNA LAGOON, TOETOES BAY,
SOUTHLAND

In June I submitted a proposal for a reserve in the above area. Since then I have had discussions with Mr E.S. Bucknell of the Wildlife Service, Internal Affairs, with Mrs M. Barlow, ornithologist, of Invercargill, Mr R.R. Sutton, ornithologist, and Senior Field Officer, Southland Acclimatisation Society, Invercargill, and Mr O. Marshall, representing the Council of the Society.

Mr Sutton has prepared a report on the birdlife of the whole Waituna Lagoon wetland area (the report has been sent to the Invercargill Lands Office, so I have not reproduced it here). This report is outstanding; 67 species of birds are recorded, of which only 12 are introduced. 43 species are birds associated with wetland in some form - lagoon and margins, peat scrub and tarns, and gravel beaches. 15 of these 'wetland' species come into the category of migratory visitors; they are usually of great interest to ornithologists, and some of them are very rarely seen in New Zealand. Examples are the American whimbrel, recorded only three times for all New Zealand, or the curlew sandpiper, more plentiful at Waituna than anywhere in the South Island. The area also includes rare native waterfowl like the marshcrake.

The finest waterfowl habitat is the western end (my area C), and it is now clear to me that areas A and C of my previous report should be considered in their entirety for the proposed reserve, together with the surface of the Waituna Lagoon and any marginal or chain reserves referring to it. This contradicts p. 6 and 7 of my previous report; at that stage I did not appreciate the richness of the lagoon and its environs as waterfowl habitat. If the lagoon surface can be reserved, powered boats should be banned. If area B can ultimately be acquired, so much the better. As noted before, (p. 5 and 7) area C includes excellent Donatia bog and lagoon edge vegetation, and is desirable on botanical grounds.

Control: the proposed reserve is of outstanding scientific interest both for its birdlife and its botany, and I would definitely recommend that it be under Crown Control, so that continuity of management policy can be ensured. Lands and/or Wildlife can draw on a wide range of professional advice when necessary, to ensure sound management.

As I outlined in my first report, a wetland reserve of this kind presents special problems. The various uses to which the reserve may be put appear to conflict, but the ultimate fact is that all uses depend on preservation of the wetland environment. It may not be necessary to curtail the use of the reserve by any particular group of people, unless it can be demonstrated that they are disrupting the environment in some way. The questions of shooting, fishing, buildings in the proposed reserve, travelling into the reserve by motor-vehicle, etc. arise in this context. As the Southland Acclimatisation Society will probably not be very happy with Crown Control, and as their co-operation is desirable, I would suggest perhaps a trial period of minimum restrictions to see whether a working relationship can be achieved between reserving and other uses (particularly shooting). This puts the onus on the present users. Education against burning is probably the most important requirement.

The Southland Society can play a very important role in the preservation of this wetland. They are, for example, familiar with the area and visit it fairly regularly; they are thus well equipped for day to day public relations. Within their membership they include the full range of conservationists, fishermen and shooters. There is thus much to be gained by enlisting their goodwill and support.

Therefore I would suggest that though the reserve be under Crown Control, that management be assisted by an advisory committee under the chairmanship of the Invercargill Commissioner or his deputy. The committee should at least include representatives of the Southland Acclimatisation Society (perhaps a Field Officer and a Council member), and the Wildlife Service of Internal Affairs. This would allow discussion, as necessary, of the various problems, for example when to open the lagoon. Clearly the Society's Field Officers would be the most effective Rangers available for a wetland reserve, and this would be facilitated by having formal co-operation.

In making these suggestions to the sub-Committee I am perhaps going beyond what is desired, but I feel that the promotion of goodwill between the Society and the Government Departments is of some importance since the Society has for some years been interested in part of the area under consideration. A three year trial along the above lines will require give and take on both sides, but it will enable a fair review of the problem, the results of which will of more than local interest.

G.C. Kelly

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