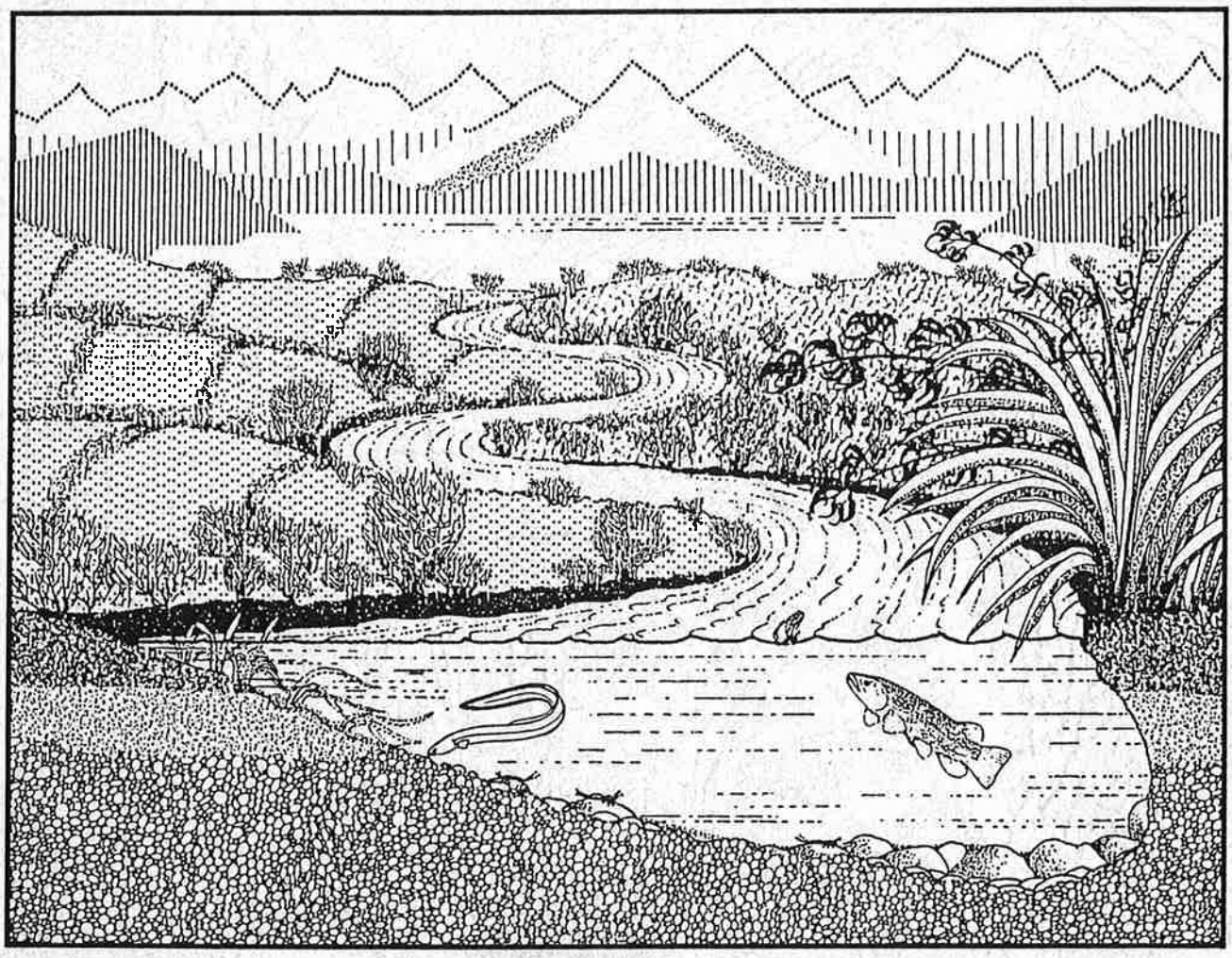
ISSN 0113-2504

New Zealand Freshwater Fisheries Report No. 90

Wetlands of national importance to fisheries



MAFFish

New Zealand Freshwater Fisheries Report No. 90

Wetlands of national importance to fisheries

by

S.F. Davis

Freshwater Fisheries Centre

MAFFish

Christchurch

October

1987

NEW ZEALAND FRESHWATER FISHERIES REPORTS

This report is one of a series issued by the Freshwater Fisheries Centre, MAFFish, on issues related to New Zealand's freshwater fisheries. They are issued under the following criteria:

(1) They are for limited circulation, so that persons and organisations normally receiving MAFFish publications should not expect to receive copies automatically.

(2) Copies will be issued free only to organisations to which the report is directly relevant.

(3) Copies will be issued to other organisations on request. A schedule of charges is included at the back of each report. Prices include GST, packaging, and postage.

(4) Organisations may apply to the librarian to be put on the mailing list to receive all reports as they are published. An invoice will be sent with each new publication.

ISBN 0-477-08059-6

MAF Fish

MAFFish is the fisheries business group of the New Zealand Ministry of Agriculture and Fisheries. It was established on 1 April 1987 and combines the functions of the old Fisheries Research Division and Fisheries Management Division, and the fisheries functions of the old Economics Division.

The New Zealand Freshwater Fisheries Report series continues the Fisheries Environmental Report series.

Enquiries to:

The Librarian
Freshwater Fisheries Centre
PO Box 8324
Christchurch
New Zealand.

CONTENTS

	Page
Summary	5
1. Introduction	5
2. Nationally Important Wetlands	8
2.1 Northland	12
2.2 Auckland	14
2.3 Bay of Plenty	15
2.4 Hawke's Bay	16
2.5 Manawatu	18
2.6 Wellington	20
2.7 Nelson	21
2.8 Marlborough	24
2.9 West Coast	24
2.10 Canterbury	27
2.11 Waitaki Valley	29
2.12 Otago	31
2.13 Southland	33
3. Discussion	35
4. Acknowledgments	38
5. Literature Cited	39
Appendix I. Schedule of Protected Waters: Draft Legislation	42
Appendix II. IUCN criteria for selecting wetlands of international importance	43
Appendix III. Criteria for assessing wetland conservation values	45
Appendix IV. Wetlands recommended to Cabinet by the Ministry of Works and Development for inclusion in a Schedule of Protected Waters	46

TABLES

1. Criteria for selecting nationally important wetlands for fisheries	9
2. Common and scientific names of freshwater fish	13

Page

3. Status of applications for National Water Conservation Orders (NCO) and Local Conservation Notices (LCN) for rivers and lakes 22

4. Additional wetlands nominated by the Freshwater Fisheries Centre for inclusion in the proposed Schedule of Protected Waters 38

FIGURES

1. Location of North Island wetlands of importance to fisheries 10

2. Location of South Island wetlands of importance to fisheries 11

SUMMARY

The Water and Soil Conservation Act (1967) is to be revised. It has been proposed that the Government include a Schedule of Protected Waters in the new Water and Soil Bill, to protect waterbodies with important natural values. Initially, the Schedule was to include only rivers and lakes which were identified as being worthy of legislative protection. However, it is now likely that the Schedule will be extended to include wetlands.

To assist the process of selection, fisheries staff have identified those wetlands which are known to have significant fisheries values. This report lists these wetlands, gives a background of some of the history leading up to the preparation of the Schedule of Protected Waters, and discusses the limitations of the list of wetlands proposed for inclusion.

1. INTRODUCTION

In 1979, the Government adopted what has become known popularly as the "wild and scenic rivers" policy. The principal objective of this policy was to protect rivers, or reaches of rivers, with outstanding wild, scenic, recreational, or other natural characteristics. The policy was incorporated into statute by the 1981 Amendment to the Water and Soil Conservation Act (1967), with its stated objective being "to recognise and sustain the amenity afforded by waters in their natural state". The amendment provides for applications for Water Conservation Orders and Notices to "preserve and protect the wild, scenic, and other natural characteristics of rivers, streams, and lakes". Because it refers only to these, its greatest limitation is that it makes no provision for the protection of wetlands.

New Zealand's wetlands have declined dramatically in number and extent since European colonisation began in the mid 1800s. Much swampland has been drained and converted for agricultural production, and many estuaries and inlets have been filled in or used as rubbish dumps. There is not much wetland left throughout the country, and very little of this remains in its natural state.

Since 1973, when the Environmental Council recommended to the Government that wetlands should be conserved and that wetland policy guidelines were required, it has been recognised that New Zealand's wetland resources need legislative protection.

In 1981, the Nature Conservation Council stated that wetland protection was a matter of national importance and should be given priority, because they were "fast becoming some of our rarest ecosystems" (Nature Conservation Council 1982). Some progress was made in 1983, when the Wetlands Task Group of the Environmental Council produced a report (Wetlands Task Group 1983) which identified wetland values and described their present status and trends. The report also outlined wetland policy options and made a number of recommendations. They advised particularly that a wetland inventory be compiled which would classify, evaluate, and rank wetland values.

The Commission for the Environment undertook to co-ordinate the inventory, which is commonly referred to as WERI - wetlands of ecological and representative importance (Simpson 1985). The object of WERI is to identify representative or otherwise important examples of all types of wetlands of international, national, regional, and local ecological significance. The inventory will also be compatible with, and contribute to, the Protected Natural Areas (PNA) programme being implemented by the National Parks and Reserves Authority (Department of Lands and Survey 1984). Much of the inventory lists sites of special wildlife interest which have been recorded in the Wildlife Service's National Habitat Register, with some input from other agencies such as DSIR, Lands and Survey, Forest Service, Ministry of Agriculture and Fisheries (MAF), catchment authorities, acclimatisation societies, and the Royal Forest and Bird Protection Society. The data base is maintained by the Biological Resources Centre on the DSIR's computer and is now almost complete.

In March 1985, the Ministers for the Environment and Works and Development issued a joint policy statement announcing that a "Schedule of Protected Waters" was to be included in the revised Water and Soil Conservation Bill. This new legislation will repeal the 1981 "wild and scenic rivers" amendment, although Water Conservation Orders which have been granted under that legislation will be confirmed. The proposed

Schedule will provide interim protection for a list of waterbodies identified as warranting inclusion. The "interim protection" provisions (Appendix I) will prevent substantial or irreversible modification by dams, diversions, or discharges, although minor abstractions and discharges will be allowed. Activities such as exploration and prospecting will also be permitted, and existing water rights and long-term river protection works will continue. If a major development is proposed for a particular waterbody on the Schedule, or if the conditions for its protection need to be more precisely defined, a hearing process will be held along the lines of the existing Water Conservation Order procedures. Waterbodies not included in the Schedule may also be considered for protection by the same process, which will have provision for appeal to the Planning Tribunal. All waterbodies within national parks will also automatically receive the same level of protection as those listed in the Schedule.

When the Government announced these proposed measures for protecting important waterbodies, public submissions on the policy were sought, together with opinions about the inclusion of lakes, geothermal fields, and wetlands in the Schedule. These submissions were considered by a government-appointed committee, the Protected Waters Assessment Committee (PWAC), which was set up in February 1986. Its task was to advise the Government on suitable criteria for identifying rivers and lakes for inclusion in the Schedule, and to assign a priority ranking to those waterbodies recommended for inclusion, taking public submissions into account. The Committee's brief did not cover geothermal fields or wetlands. Their report (Grindell and Guest 1986) was published in June of last year.

In the meantime, in February 1986, the Government adopted a policy for the national management of wetlands (Commission for the Environment 1986), to be administered by the new Department of Conservation. The Environmental Council established a committee to develop strategies for implementing the policy, and to promote its adoption by management agencies. Comments on the policy, and the extent to which its goals and objectives are currently being implemented, were sought from organisations involved in the management of New Zealand's wetland resources. The responses have been reviewed by the Council, and areas of needed action have been identified (Environmental Council 1987).

In May 1986, after the wetlands policy had been released, the Government decided that wetlands should also be considered for inclusion in the Schedule of Protected Waters. Because there was little time to compile a list of wetlands, the Ministry of Works and Development (MWD) sought the assistance of the following government departments: Fisheries Research and Management Divisions of MAF, Wildlife Service and Recreation and Sport section of the Department of Internal Affairs, the Commission for the Environment, Tourist and Publicity, Maori Affairs, Lands and Survey, DSIR, Forest Service, MWD Power Division, and the Ministry of Energy.

As a starting point, MWD officials used the WERI data base to compile a list of wetlands which met the International Union for the Conservation of Nature (IUCN) criteria for selecting wetlands of international importance (Appendix II). Although these criteria allow for the selection of wetlands with fisheries values (see 1973 criterion 5, and 1981 criterion 2), a lack of fisheries information in the WERI data base meant that wetlands with significant fisheries values were seriously under-represented in this preliminary list. Therefore it was decided that an independent list of wetlands of national importance to fisheries should be compiled.

Acclimatisation societies throughout New Zealand were canvassed for their opinions on outstanding wetlands in their region, and their recommendations were combined with information from MAF's freshwater fish data base (McDowall and Richardson 1983), and the personal experience of fisheries staff. This report presents the nationally important wetlands thus identified, together with supporting documentation, and lists those nominated by MAFFish for inclusion in the Schedule of Protected Waters.

2. NATIONALLY IMPORTANT WETLANDS

In order to identify wetlands of outstanding importance for fisheries, or for any other value, it is essential to develop selection criteria. The criteria used here (Table 1) include features of the habitat, species composition, and use of the fisheries resource. These criteria are not mutually exclusive, and most wetlands qualified for inclusion on several counts.

TABLE 1. Criteria for selecting nationally important wetlands for fisheries

1.	A habitat for a rare or endangered fish species.
2.	A unique or diverse assemblage of fish species.
3.	A habitat for a fish species with limited national distribution and/or declining numbers.
4.	A biologically or scientifically important fishery or fish habitat.
5.	An unmodified wetland habitat with significant endemic fisheries values.
6.	A particularly good example of a specific type of fishery or fish habitat.
7.	A remnant or regionally representative wetland with significant fisheries values.
8.	A nationally important non-salmonid fishery, including commercial and traditional Maori fisheries.
9.	A nationally important salmonid fishery.
10.	A wetland which is particularly important as a water retention or riparian buffer zone for fisheries in the catchment.

Once the list of nationally important wetlands was compiled, it was realised that the Government would approve only a small number for inclusion in the Schedule, despite the fact that many, if not all, of New Zealand's remaining wetlands need to be conserved. Therefore, the wetlands identified for their fisheries values were ranked on a subjective scale:

A = outstanding, and must be included in the Schedule if at all possible;

B = significant, and should be included in the Schedule if non-fisheries values are also high;

C = important, and inclusion in the Schedule would be desirable, but it may be necessary to resort to other measures of protection.

Each of the wetlands identified (Figs. 1 and 2) is described below, in approximate geographical order from north to south. The map

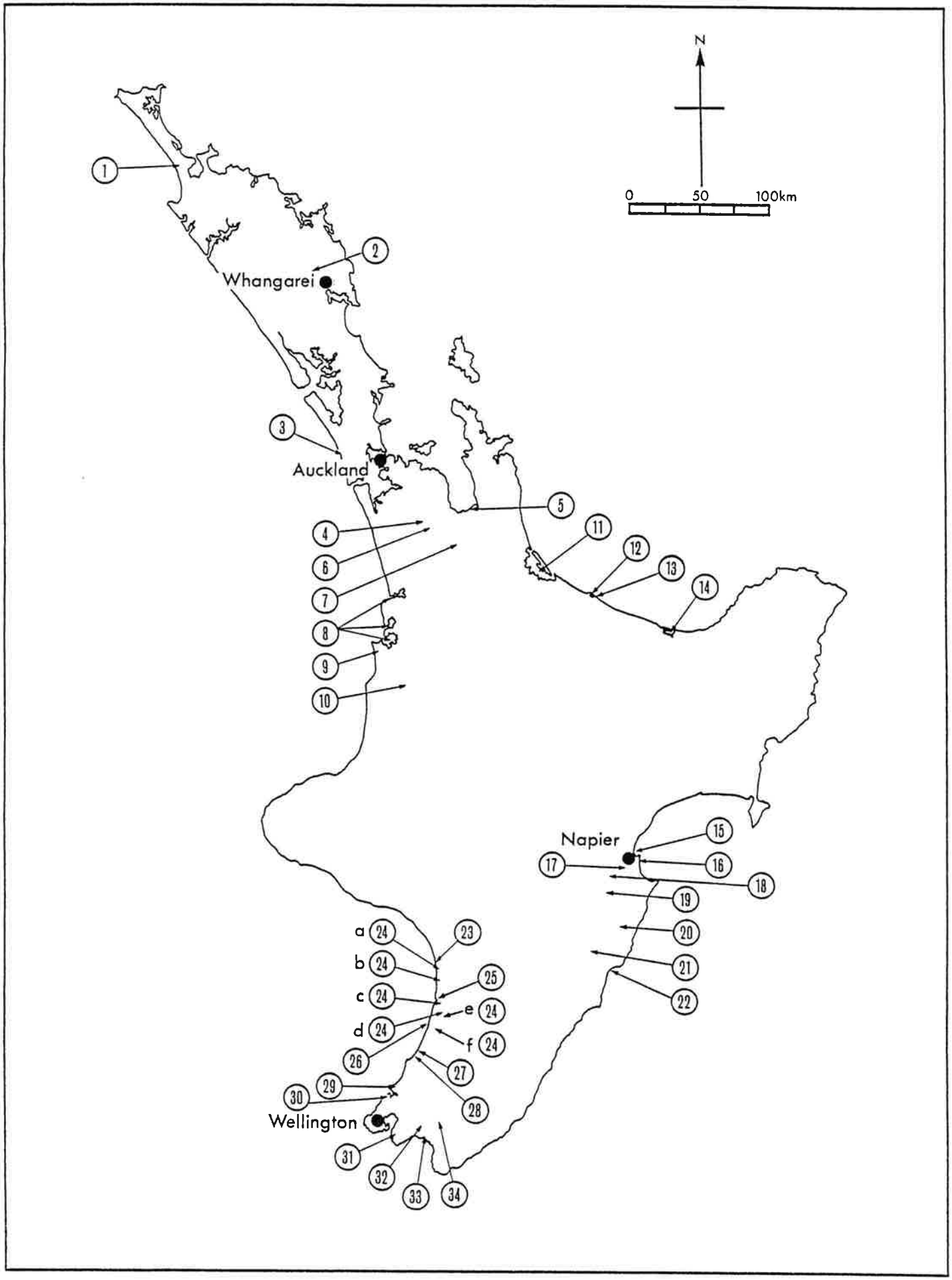


FIGURE 1. Location of North Island wetlands of importance to fisheries .

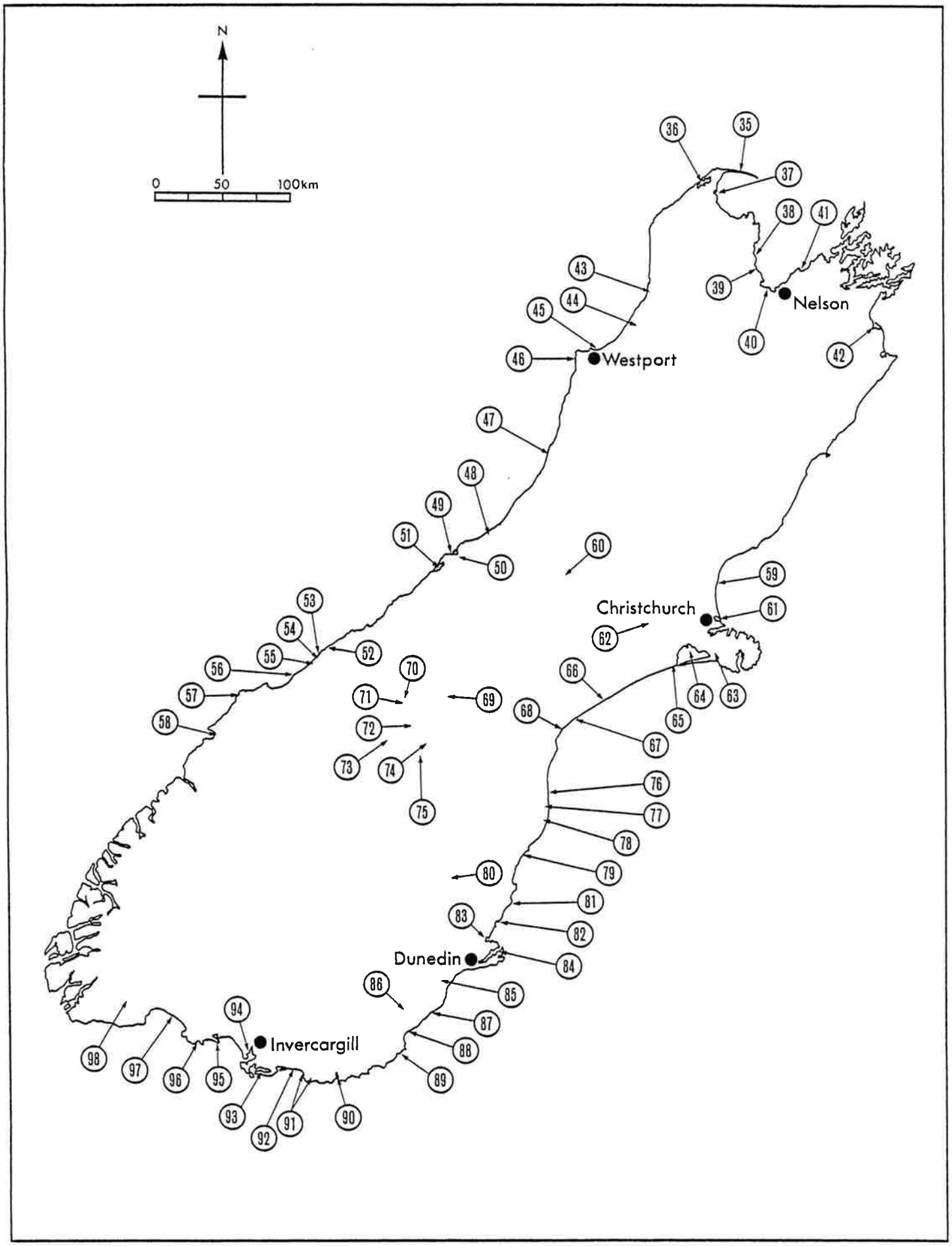


FIGURE 2. Location of South Island wetlands of importance to fisheries .

references indicate the wetland's location, but do not delimit the extent of the area requiring protection. The references given are for the metric series NZMS#260 where this is available; if not, they are for the imperial NZMS#1 series. The relative ranking assigned to each wetland (as described above) is given in parentheses after the map reference. Those with an A-ranking also have a list of the criteria by which they qualified for inclusion in that category. Some estuaries were not assigned a ranking because their fisheries values were not well enough known. The amount of evidence supporting each nomination varies, depending on how much field work has been done on the wetland or in the surrounding catchment. Table 2 lists the scientific and common names of New Zealand's freshwater fish species.

2.1 Northland

1. Kaimaumau Block, comprising Motutangi Swamp (N03 285015), Kaikino Swamp (N04 291947), and Kaimaumau Swamp (004 345995) (A)

This is the most outstanding wetland of any size remaining in Northland. It comprises about 4600 ha, known as the Kaimaumau Farm Settlement Block, and is located just north of Kaitaia. It is an oligotrophic, non-mineralised, highly acidic bog system, incorporating a variety of habitat types: open water, raupo swamp, gum digger holes, natural water courses, and realigned channels. A peat mining licence has been issued recently, covering an area of about 2300 ha, and the processing plant for kauri resin extraction was commissioned in November 1986. Mined areas are to be converted to pasture. A scientific reserve of approximately 895 ha for the protection of fisheries, wildlife, and botanical values has been gazetted under the provisions of the Reserves Act. The area carries a population of the endangered black mudfish, which are restricted to water-filled depressions left by gum excavations, and are dependent on water levels being maintained. Criteria 1, 3, 4, 7.

2. Hikurangi Swamp (N20 754143) (A)

This swamp had an original area of about 1500 ha, about 15% of which was open water. However, it has been modified greatly, and reduced in area to about 400 ha (Anderson *et al.* 1984). It contains a population of the endangered black mudfish, and supports a regionally important commercial eel fishery. Criteria 1, 3, 4, 7.

TABLE 2. Common and scientific names of freshwater fish

Common name	Scientific name
Native species	
Lamprey	*Geotria australis*
Short-finned eel	*Anguilla australis*
Long-finned eel	*Anguilla dieffenbachii*
Common smelt	*Retropinna retropinna*
Stokell's smelt	*Stokellia anisodon*
*Giant kokopu	*Galaxias argenteus*
*Banded kokopu	*Galaxias fasciatus*
*Short-jawed kokopu	*Galaxias postvectis*
*Inanga	*Galaxias maculatus*
*Koaro	*Galaxias brevipinnis*
Dwarf inanga	*Galaxias gracilis*
Common river galaxias	*Galaxias vulgaris*
Alpine galaxias	*Galaxias paucispondylus*
Longjawed galaxias	*Galaxias prognathus*
Dwarf galaxias	*Galaxias divergens*
Canterbury mudfish	*Neochanna burrowsius*
Brown mudfish	*Neochanna apoda*
Black mudfish	*Neochanna diversus*
Torrentfish	*Cheimarrichthys fosteri*
Common bully	*Gobiomorphus cotidianus*
Blue-gilled bully	*Gobiomorphus hubbsi*
Red-finned bully	*Gobiomorphus huttoni*
Giant bully	*Gobiomorphus gobioides*
Upland bully	*Gobiomorphus breviceps*
Cran's bully	*Gobiomorphus basalis*
Black flounder	*Rhombosolea retiaria*
Introduced species	
Quinnat (chinook) salmon	*Oncorhynchus tshawytscha*
Sockeye salmon	*Oncorhynchus nerka*
Atlantic salmon	*Salmo salar*
Brown trout	*Salmo trutta*
Rainbow trout	*Salmo gairdnerii*
Brook char	*Salvelinus fontinalis*
Mackinaw	*Salvelinus namaycush*
Tench	*Tinca tinca*
Goldfish	*Carassius auratus*
Rudd	*Scardinius erythrophthalmus*
Mosquitofish	*Gambusia affinis*
Sailfin molly	*Poecilia latipinna*
Perch	*Perca fluviatilis*
Catfish	*Ictalurus nebulosus*
Koi carp	*Cyprinus carpio*
Grass carp	*Ctenopharyngodon idella*
Estuarine species	
Yellow-eyed mullet	*Aldrichetta forsteri*
Grey mullet	*Mugil cephalus*
Kahawai	*Arripis trutta*

* Whitebait species

Northland Estuaries and Harbours

Northland harbours have extensive estuaries and wetlands which are valuable for fisheries. The following are particularly important: Waipoua, Whangarei, Horahora, Ngunguru, Matapouri, Wananaki, Whangaruru, Bay of Islands, Whangaroa, Mangonui, Rangaunu, Houhora, Parengarenga, Herekino, Whangape, Hokianga, and Kaipara.

2.2 Auckland

3. Lake Okaihau (also known as Haughtons Lake) (Q11 389871) (B)

This lake, which has a raupo margin, contains a landlocked population of banded kokopu, and supports an important recreational coarse fishery for tench, rudd, and perch. It was gazetted as a State Forest Ecological Area in 1976, under the Forests Act (1949).

4. Mangatawhiri Swamp (S12 922358) (A)

This swamp contains a substantial population of the endangered black mudfish (Thompson 1986). Criteria 1, 3, 4, 5, 6, 7.

5. Firth of Thames (S12 230410) (A)

The southern fringe of this estuary is a large mangrove swamp, and is important for the spawning and rearing of marine fish species. Criteria 2, 4, 5, 6, 8.

6. Whangamarino Swamp (N52 650030) (A)

The Whangamarino Swamp occupies an area of approximately 93 km^2, east of the Waikato River. Although parts of the wetland have been modified by agricultural encroachment, stopbank construction and flood control measures, it carries a great diversity of fish species, including black mudfish, banded kokopu, common smelt, inanga, and torrentfish (Strickland 1980). The swamp also supports important commercial fisheries for eels, catfish, and grey mullet. Criteria 1, 2, 3, 4, 6, 7, 8, 10.

7. Hauraki-Piako-Kopuatai Peat Domes (T13 360170) (C)

The west Kopuatai peat dome and east Hauraki plains are known to contain populations of the endangered black mudfish (Thompson 1986), and populations may be found elsewhere in this area.

8. Kawhia (R15 720450) (A), Aotea (R15 725570) (B), and Raglan (R14 780770) (B) Harbours

These harbours are of outstanding importance to the Maori people as traditional fishing areas.

9. Lakes Taharoa, Numiti, Rotoroa and associated wetlands (N73 267005) (B)

These large, unmodified wetlands are interconnected, and together provide approximately 224 ha of open water and another 145 ha of raupo, flax, and sedge fringes. The fish fauna comprises only native species (Strickland 1985), and supports valued traditional Maori fisheries for eels, whitebait, and grey mullet. Commercial eel fishing is prohibited by the lake trustees.

10. Mangaparo (Clarkes) Swamp (N83 587703) (A)

This swamp comprises 30-40 ha of wetland adjacent to the Mokau River, and contains the southernmost recorded population of black mudfish (Thompson 1986). Criteria 1, 3, 4, 5, 7, 10.

11. Tauranga Harbour (U13 725105) (A)

Tauranga Harbour is an important spawning and rearing area for marine fish species, and is popular for recreational flounder fishing. The mudflats support valuable fisheries for shellfish. The harbour is of outstanding importance as a traditional Maori fishing area for inanga, eels, kahawai, and whitebait. Its tributary streams support a regionally important whitebait fishery and provide spawning habitat for inanga. Parts of the estuary are protected. The northern end of Matakana Island was established privately as a Wildlife Refuge in 1956, and Waikaereo Estuary, an enclosed estuary at the south-east end of the harbour, was gazetted as a Wildlife Refuge by the Tauranga Acclimatisation Society in 1957. Criteria 2, 4, 6, 8.

2.3 Bay of Plenty

12. Maketu Estuary (N68 910502) (B)

This estuary is important to the Maori people as a traditional fishing area, although it has been modified substantially by the local catchment board.

13. Waihi Estuary (N68 945485) (B)

This estuary is also important as a traditional Maori fishing area, and

supports a popular recreational flounder fishery. Its tributary streams support a regionally important whitebait fishery, and are important for inanga spawning habitat. In 1966, the Tauranga Acclimatisation Society gazetted the remnant estuarine margin as a Government Purpose (Wildlife Management) Reserve, under the Wildlife Act (1953) and the Reserves Act (1977).

14. Ohiwa Harbour (N69 530210) (A)
Ohiwa Harbour is an important spawning and rearing area for marine fish species, and is popular for recreational flounder fishing. The mudflats support valuable shellfish fisheries. This harbour lies at the southernmost world limit for mangroves, the area of which is increasing. It has outstanding importance as a traditional Maori fishing area for inanga, eels, kahawai, and whitebait, and its tributary streams support a regionally important whitebait fishery, and provide inanga spawning habitat. Three islands within Ohiwa Harbour are protected. In 1982, the Department of Lands and Survey gazetted Motuotu Island and its foreshore as a Nature Reserve, and designated Patawa Island and its surrounding intertidal mudflats as a Scientific Reserve. The Wildlife Service has also gazetted the tip of the coastal sand spit at the harbour entrance as a Wildlife Refuge since 1976, and Tern Island as a Government Purpose (Wildlife Management) Reserve since 1974. Criteria 2, 4, 6, 8.

2.4 Hawke's Bay

15. Ahuriri Estuary and Westshore Lagoons (V21 425840) (A)
The remaining 450 ha of the original estuary are an important nursery for marine and freshwater fish species. On the margins is a salt-marsh herbfield of *Zostera*, glasswort, and shore pimpernel, with *Juncus* and *Leptocarpus* rushland on higher ground. The area has high recreational value, being close to the town of Napier, and it supports flounder and eel fisheries. It is one of the few large estuaries on the North Island's east coast, and is under investigation for Marine Reserve status. It has been designated as a Wildlife Refuge since 1958. Criteria 2, 4, 6, 7, 8.

16. Waitangi Estuary (V21 473745) (A)
This 90 ha estuary includes the mouths of the Ngaruroro, Tutaekuri, and

Clive Rivers, and Muddy Creek. The area is well used, and supports very popular recreational (and some commercial) fisheries for whitebait, eels, yellow-eyed and grey mullet, flounder, and kahawai. Criteria 2, 4, 6, 8.

17. Oingo Lake (V21 320757) (C)
This 120 ha lake is mostly less than 2 m deep, and supports a commercial eel fishery. It has extensive raupo margins, and is eutrophic.

18. Lake Runanga (N21 282740) (B)
Lake Runanga is shallow and largely unmodified, and covers an area of 160 ha, with raupo and willow margins. It supports commercial and traditional eel fisheries, and is the most important lake for high quality short- and long-finned eels in Hawke's Bay.

19. Peka Peka Swamp (V22 323573) (A) and Lake Poukawa (V22 270515) (A)
Peka Peka Swamp (50 ha) is the only large swamp remaining in Hawke's Bay. The wetland is maintained by Poukawa Stream, the outflow from Lake Poukawa, and can dry up during droughts. It gives access to Lake Poukawa for short- and long-finned eels, and provides a rearing area for inanga. Lake Poukawa is a large (195 ha) shallow lake, fringed with raupo, and supports a traditional Maori eel fishery. It is also an important area for waterfowl. The Hawke's Bay Catchment Board is currently preparing a water management plan for the swamp, and lake levels have been set for Lake Poukawa. Criteria 7, 8, 10.

20. Horseshoe Lake (V22 315360) (C)
This shallow lake of about 40 ha supports a commercial eel fishery, and has been gazetted as a Wildlife Refuge since 1957.

21. Lake Hatuma (V23 110255) (C)
This 110 ha lake is fringed with raupo and supports a commercial eel fishery. The area can dry out during droughts, such as that in 1983.

22. Porangahau Estuary (V24 230977) (A)
This is one of the few large estuaries on the North Island's east coast, and it covers about 750 ha. It supports recreational fisheries for whitebait, flounder, mullet, and kahawai, and is the only known breeding site in the region for Caspian Tern. Criteria 2, 4, 6, 8.

2.5 Manawatu

23. Rangitikei River Estuary (S24 998994) (B)

This tidal estuary contains a large (1 km^2) tidal flat on its southern margin, which provides excellent galaxiid breeding habitat. The estuary supports recreational fisheries for whitebait, black flounder, kahawai, mullet, and sea-run brown trout. The quinnat salmon which are caught occasionally are strays from the South Island.

24. Dune Lakes (A)

The wetlands of the Manawatu, Horowhenua, and Rangitikei-Wanganui dune lakes complex are valuable collectively for fisheries and wildlife. They are generally shallow (0.2-3.0 m), and have little riparian vegetation. Although they are turbid, most do not suffer from algal blooms, and they maintain their water levels, even during summer, probably because of underground inflows. Ideally, they should be protected as a group. Those that are connected to the sea or to rivers are particularly important for whitebait. Those with specific fisheries values are described below. Criteria 4, 7, 8.

(a) Pukepuke Lake (S24 023936)

This is the least modified of the dune lakes in this area, and its shoreline is covered with raupo, *Carex*, flax, and cabbage trees. It contains an unexploited population of short-finned eels, as well as other native fish, including brown mudfish. The lake has been gazetted as a Government Purpose (Wildlife Management) Reserve by the Wildlife Service.

(b) Kaikokopu (S24 023898), Koputara (S24 020870), and Foxton Lakes (No's 1 (Omanu) (S24 010816), 2 (S24 010822), 3 (S24 013837), and 4 (S24 013845))

These lakes carry a diverse native fish fauna, and their outlets support small whitebait fisheries.

(c) McLennans Lagoon (S24 986717)

McLennans Lagoon is a remnant wetland which may contain brown mudfish.

(d) Ohau Maori Lakes (especially Lake Rotomahana) (S25 984682)

These lakes support a Maori eel fishery and a diverse native fish fauna.

(e) Lake Horowhenua (S25 010640) and Hokio Stream (S25 990645)
Lake Horowhenua supports a traditional Maori eel fishery, and is 1 of only 2 gazetted exclusively as such (the other is Lake Forsyth in Canterbury). The lake contains a diverse native fish fauna, as well as carp. Algal blooms sometimes appear during summer. Hokio Stream is an important whitebait fishery.

(f) Lake Wairongamai (S25 910527)
This lake is under Maori ownership, and supports a traditional eel fishery.

25. Manawatu River Estuary (S24 997785) and Whirikino Cut (S24 013764) (B)
The Manawatua River is tidal for a considerable distance upstream (above Shannon), and extensive tidal flats lie below the Whirikino Cut, which carries a population of brown mudfish. The estuary is important for rearing and spawning of marine and freshwater fish, and also supports black flounder, mullet, and whitebait fisheries.

26. Ohau Estuary and associated wetland (S25 924580) (B)
The northern side of this estuary consists of high dunes, but to the south is a large, low-lying wetland, with a mixed native and introduced flora dominated by rushes and *Carex* spp. The estuary contains only small tidal flats, although the river is tidal for about 5 km upstream. The area supports whitebait, flounder, and mullet fisheries and provides extensive inanga spawning habitat.

27. Otaki Estuary (N157 640860) (B)
The Otaki River mouth is very gravelly, with no tidal mud flats. On each side of the mouth are small wetlands and spring-fed creeks, which are reported to contain populations of giant kokopu. The estuary supports a whitebait and flounder fishery, and provides spawning and rearing habitat for marine and freshwater fish species.

28. Waikanae River Estuary (N156 546723) (C)
The Waikanae River is tidal for about 2 km upstream, and has a large tidal flat on its southern margin, which is dominated by rush and *Carex* spp. The estuary supports recreational fisheries for whitebait and flounder. Residential development is taking place on both sides of the river mouth.

3.6 Wellington

29. Taupo Swamp (R26 675134) (B)

The last significant remnant wetland in the Wellington region, this raupo and flax swamp covers an area of about 30 ha. It holds populations of giant and banded kokopu, and eels, and is likely to contain brown mudfish. It is now a Scientific Reserve.

30. Pauatahanui Inlet (R27 706096) (B)

Porirua Harbour is the only enclosed water body of importance on the North Island's west coast, south of Kawhia. Pauatahanui Inlet is a tidal estuary with extensive tidal flats and salt-marshes. The inlet is designated as both a Wildlife Refuge and a Government Purpose (Wildlife Management) Reserve by the Wildlife Service. Because the area is becoming increasingly urbanised, siltation is increasing and the water quality is deteriorating. It is an important feeding, breeding, and nursery ground for marine fish species such as rig, and it is a traditional Maori shellfish collecting area. The eastern swamp is the most important wetland. Three whitebait species, giant kokopu, banded kokopu, and inanga, have been identified from its tributary streams. Duck Creek, a salt-marsh rushland on the shores of Pauatahanui Inlet, was gazetted as a Scenic Reserve by the Department of Lands and Survey in 1976.

31 Lakes Kohangatera (R27 662805) and Kohangapiripiri (R27 654813) and associated wetlands (A)

These are 2 of the few freshwater wetlands in the Wellington region. They contain significant populations of giant kokopu, and of both eel species. The wetlands associated with the lakes are an integral part of the fish habitat. Criteria 1, 3, 4, 5, 7.

32. Lake Pounui (R27 868826) (B)

This lake's catchment is predominantly native bush, with some pasture. It has extensive raupo margins, and 2 swampy arms at 1 end. The lake supports an unexploited population of long- and short-finned eels, as well as giant kokopu and a small population of brown mudfish. Perch are also present.

33. Lake Onoke (R28 885785) (B)

A shallow, saline lake, cut off from the sea by a shingle spit which

opens periodically. It supports a recreational whitebait fishery, a small traditional Maori eel fishery, and commercial and recreational fisheries for flounder. The lake is also an important feeding area for marine fish species and a breeding area for galaxiid species.

34. Lake Wairarapa and associated wetlands (S27 980970) (A)
Before the mid 1960s, the Ruamahanga and Tauherinikau Rivers contributed significantly to the south Wairarapa wetland complex, which extended from the northern margin of Lake Wairarapa to the sea at Lake Onoke. However, the Ruamahanga River has been diverted and the outlet of Lake Wairarapa is controlled, so that most of the wetlands associated with the Ruamahanga River have been destroyed. The only significant wetlands remaining in the area are those directly associated with Lake Wairarapa (Buchanan n.d.). These contain populations of whitebait, smelt, brown mudfish, giant kokopu, both eel species, yellow-eyed mullet, perch, and flounder. The eel populations in the lake are exploited commercially by a regionally important fishery. Whitebait, flounder, brown trout, and perch all support recreational fisheries. Lake Wairarapa is a large, shallow lake, with a surface area of about 7000 ha, which varies with the water level. Neither the lake's tributaries, nor the "associated wetlands" (e.g., Home Lagoon, Ruamahanga Cut-off, Mathews Lagoon, Boggy Pond, J.K. Donald Lagoons, Simmonds Lagoon, Lake Domain, Turners Lagoon, Pierce Lagoons) are included in the draft National Water Conservation Order granted for Lake Wairarapa. (The Water Conservation Order has been appealed to the Planning Tribunal - see Table 3.) The wetlands probably contain a population of brown mudfish, and need to be protected in their own right. This area is considered to be the third most important wetland wildlife habitat in New Zealand (Buchanan n.d.). Criteria 1, 2, 3, 4, 6, 7, 8.

2.7 Nelson

35. Farewell Spit (M/N24 975770) (B)
Farewell Spit covers an area of about 11 400 ha at the northernmost point of the South Island. Measuring 1 km at its widest, it comprises fixed and wandering sand dunes, small lakes, extensive *Zostera* beds, and expansive salt-marsh and tidal sandflats. There are large shellfish beds, and the area is important as a rearing habitat for juvenile marine fish species. The spit is recognised internationally as a habitat for

TABLE 3. Status of applications for National Water Conservation Orders (NCO) and Local Conservation Notices (LCN) for rivers and lakes

River/lake	Date application lodged	Applicant(s)	Type of application	Current status
Motu	April 1982	QEII Trust	NCO	Order in Council gazetted February 1984.
Rakaia	June 1982	Ashburton & North Canterbury Acclim. Socs.	NCO	NCO recommended by Planning Tribunal. Appealed to High Court by Federated Farmers July 1985. High Court decision appealed to Court of Appeal December 1986. Decision of the Planning Tribunal upheld by Court of Appeal September 1987.
Ahuriri	January 1983	Waitaki Valley Acclim. Soc. & Minister of Internal Affairs	NCO	Draft NCO recommended by NWASCA*. Appealed to the Planning Tribunal by several parties. Awaiting outcome of Rakaia appeal.
Stoney	August 1983	Taranaki Acclim. Soc.	LCN	Gazetted December 1985.
Mataura	July 1984	Otago & Southland Acclim. Socs.	NCO	Draft NCO recommended by NWASCA. Objections lodged with the Planning Tribunal May 1986.
Rangitikei	August 1984	Wellington Acclim. Soc.	NCO	Draft NCO recommended by NWASCA. Objections lodged with the Planning Tribunal April 1986.
Pomahaka	September 1984	Otago Acclim. Soc.	LCN	Hearing held by Otago Regional Water Board August 1985. Decision reserved until outcome of Rakaia appeal is known.
Lake Wairarapa	October 1984	Wellington Acclim. Soc.	NCO	Draft NCO recommended by NWASCA. Objections lodged with the Planning Tribunal March 1987.
Wairau	November 1984	Marlborough Acclim. Soc.	LCN	Draft LCN recommended by Marlborough Regional Water Board. Appealed to the Planning Tribunal November 1986.
Lake Tuakitoto	February 1986	Otago Acclim. Soc.	NCO	Being considered by NWASCA.
Lake Ellesmere	June 1986	Minister of Internal Affairs	NCO	Public submissions closed.
Manganuioteao	December 1986	Minister of Internal Affairs	NCO	Public submissions closed. Public hearing scheduled for November 1987.
Buller	October 1987	Nelson Acclim. Soc.	NS**	Application lodged with Minister of Works and Development.
Mokau	October 1987	Hawke's Bay Acclim. Soc.	NS	Application lodged with Minister of Works and Development.
Grey	October 1987	West Coast Acclim. Soc.	NS	Being considered by NWASCA.
Oreti	October 1987	Southland Acclim. Soc.	NS	Being considered by NWASCA.

* = National Water and Soil Conservation Authority.
** = not specified.

migratory wading birds, and has been identified by the IUCN as a "wetland of international importance". The Department of Lands and Survey designated the area as a Nature Reserve in 1938.

36. Whanganui (Westhaven) Inlet (M25 726678) (A)
This inlet has extensive tidal mudflats with large *Zostera* beds, salt-marsh communities, shellfish beds, and tidal creeks. The area is mostly unmodified, and has high scenic and recreational value. It supports extensive rearing and spawning habitat for whitebait, flounder, and yellow-eyed mullet, and may be an important juvenile snapper rearing area. The area has been identified by fisheries staff as a priority for marine reserve status. Two areas adjacent to the inlet have Scenic Reserve status: the Kaihoka Lakes on the northern side, and a peninsula on the south-eastern shore. Criteria 2, 4, 5, 6, 7.

37. Ruataniwha Inlet/Aorere River mouth (M25 820610) (B)
This area supports a significant whitebait fishery, probably the largest in the Golden Bay/Nelson region.

38. Marahau River mouth (S9 390636) (C)
The river mouth contains a productive salt-marsh and rush swamp, as well as mudflats. It supports a locally important whitebait fishery, has extensive shellfish beds, and is probably important as a juvenile flatfish rearing area.

39. Moutere Inlet (S14 410430) (B)
The Moutere inlet has large mudflats which support extensive beds of *Zostera* and shellfish. It is an important rearing area for juveniles of marine and freshwater fish species, and supports recreational fisheries for whitebait, flounder, and mullet.

40. Waimea Inlet (S20 550250) (B)
This inlet has extensive tidal mudflats, with substantial *Zostera* and shellfish beds. It is an important rearing area for juveniles of marine and freshwater fish species, and supports recreational fisheries for whitebait, flounder, and mullet.

41. Delaware Inlet (027 460035) (A)
The inlet and surrounding marshland (particularly the Wakapuaka River delta) are fairly unmodified, and are typical of estuaries in the

region. The estuary supports extensive shellfish beds of regional importance to the Maori people, and the area has been identified by fisheries staff as a priority for marine reserve status. It provides rearing habitat for marine and freshwater fish species, and supports recreational fisheries for whitebait, flounder, and mullet. Criteria 2, 4, 5, 7, 8.

2.8 Marlborough

42. Vernon Lagoons (Wairau River mouth) (P28 010630) (A)
The Vernon lagoons comprise 1040 ha of shallow estuarine water, separated from the sea by a natural boulder bank, and bounded on the inland side by salt-marsh and flat pasture. They support recreational fisheries for whitebait, kahawai, mullet, flounder, and eels, and are an important rearing area for marine fish species. Historically, this area supported an extensive Maori eel fishery, and channels cut by the Maori still remain. The lagoons were designated as a Wildlife Refuge by the Wildlife Service in 1959. Criteria 2, 4, 5, 7.

2.9 West Coast

43. Kongahu Swamp and Otomahana Estuary (L27 340840) (B)
This is a large flax and *Carex* swamp, with an extensive tidal area fringed with rushes. It provides spawning and rearing habitat for brown mudfish, giant kokopu, and inanga, and a large number of whitebaiters fish here at times. Although the area has been drained for dairy farming, it has retained a good deal of its fisheries values, and could be improved greatly if the habitat were restored (e.g., by blocking off some of the drains). The swamp was designated as a Government Purpose (Wildlife Management) Reserve by the Wildlife Service in 1975.

44. Birchfield Swamp (K29 097465) (A)
This area provides outstanding habitat for inanga, giant kokopu, and banded kokopu, and for inanga rearing. It is probably the largest undeveloped swamp of its type remaining in Buller County. It is used to a limited extent for whitebaiting by local residents. Criteria 1, 3, 4, 5, 6, 7.

45. Orowaiti Estuary and associated wetlands (K29 960393) (A)
This is a large tidal area of rushes and mudflats. Its tributary swamps of flax and *Carex* offer spawning and rearing habitat for inanga, giant kokopu, and banded kokopu. It supports a very popular whitebait fishery, and is also fished regularly for flounder and mullet by Westport residents. Criteria 1, 3, 4, 6, 7, 8.

46. Okari Estuary (K29 823310) (B)
The tidal mudflats of the Okari Estuary have extensive rush and sedge margins. A number of its tributary streams are sluggish and heavily vegetated, and they offer good rearing and spawning habitat for inanga, short-jawed kokopu, giant kokopu, and banded kokopu. The estuary supports a popular whitebait fishery, as well as fisheries for flounder and mullet, and provides rearing habitat for juvenile flatfish.

47. Grey River Lagoon (J31 618606) (B)
The tidal region of the lower Grey River supports a regionally important whitebait fishery. The associated wetlands are densely vegetated with rushes and sedges, and offer a large spawning area for inanga. Although the river has been modified by drainage and mining, it has retained its high value for fisheries.

48. Shearer Swamp (S57 335318) (B)
Shearer Swamp is a large (420 ha) pakahi-type wetland arising from a coastal lagoon, and its area of open water is limited. Although the swamp has been altered significantly by drainage, its eastern margin has retained its native bush, and it carries a population of brown mudfish.

49. Saltwater Lagoon (S63 985085) (A)
This shallow lagoon at the mouth of the Poerua River is similar to Okarito Lagoon (see 51 below), and probably carries a similar fish fauna, apart from quinnat salmon, although no fisheries surveys have been done to confirm this. It supports a significant whitebait fishery and its tributaries contain brown mudfish. It is also important for rearing and spawning of marine fish species. An area of 1359 ha currently has Scenic Reserve status. Criteria 1, 2, 3, 4, 5, 6, 8.

50. Rotokino Swamp (S63 060955) (B)
This flax swamp fills a hollow between old moraines near the Whataroa River. It contains populations of giant kokopu, banded kokopu, brown

mudfish, long-finned eel, common bully, and a small number of brown trout. It is particularly valuable as giant kokopu habitat, although parts of the swamp have been drained, and further drainage is planned. The swamp surface and a 100-m strip along the shore have been designated as a Scenic Reserve by the Department of Lands and Survey since 1930.

51. Okarito Lagoon (S63 860970) (A)

Okarito is a large tidal lagoon, with adjacent swamps, and it contains salt and fresh water. It contains populations of all 5 whitebait species, and brown mudfish, as well as large numbers of bullies, flounder, eels, kahawai, and yellow-eyed mullet. It also carries stocks of sea-run brown trout and quinnat salmon. The significance of the lagoon to the Mapourika salmon fishery has yet to be determined. It has been designated as a Government Purpose (Wildlife Management) Reserve since 1983. Criteria 1, 2, 3, 4, 5, 6, 8.

52. Ship Creek Lagoon (S87 930263) (B)

This lagoon is an unmodified habitat, and native vegetation grows to the water's edge. It supports a diverse native fish fauna, including all 5 whitebait species, both eel species, 3 bully species, and black flounder.

53. Dune Lakes and Swamp between Haast and Waita Rivers (S87 875195) (B)

The Dune Lakes area is known to hold abundant populations of long- and short-finned eels, inanga, and giant kokopu, as well as banded kokopu and common bully.

54. Tawharekiri (Maori) Lakes Complex, Waita River mouth, and surrounding pakihi (S87 879172) (A)

This area supports populations of long- and short-finned eels, giant kokopu, inanga, common bullies, and brown trout. The Waita River supports a significant commercial whitebait fishery, and its tidal lagoon provides an extensive spawning area for inanga. Maori River, Lake Tawharekiri, and the surrounding pakahi provide important rearing habitat for inanga, eels, and giant kokopu. The area supports a large eel population, which is being harvested commercially. It has been recommended as a reserve by fisheries staff. Criteria 1, 3, 4, 5, 8, 10.

55. Haast Wetlands (S87 806132) (B)
These wetlands provide important giant kokopu habitat, and support a commercial eel fishery.

56. Okuru/Turnbull/Hapuka Lagoon (S86 720080) (A)
This area contains populations of giant kokopu, giant bully, inanga, koaro, red-finned and common bullies, lamprey, torrentfish, and long- and short-finned eels. The Hapuka River is a whitebait reserve under the Whitebait Fishing Regulations 1981. Criteria 1, 2, 3, 4, 5, 6.

57. Hermitage Swamp (S96 265865) (A)
Hermitage Swamp is one of the few large, unmodified wetlands remaining in New Zealand. It provides extensive adult and juvenile whitebait rearing habitat, and there is a large spawning area in the tidal reach. Large stocks of short- and long-finned eels are also likely to be present. The swamp has been recommended as a reserve by fisheries staff because of its pristine state. Criteria 4, 5, 6.

58. Awarua River and Waiuna Lagoon (S105 065570) (A)
The lower Awarua River is one of the few stable lowland rivers with an unmodified forest catchment remaining in New Zealand. It is an important commercial and recreational whitebait fishery, and its lower reaches contain numerous inanga, as well as populations of several other endemic species. Waiuna Lagoon supports a small commercial eel fishery, as well as populations of brown trout, giant kokopu, and common bullies. Fisheries staff have recommended to the N.Z. Forest Service that the lagoon be established as an ecological reserve, and that eel fishing be prohibited. Criteria 1, 3, 5, 7.

2.10 Canterbury

59. Ashley-Saltwater Lagoon (M35 873698) (B)
The Ashley River/Saltwater Creek estuary covers about 170 ha of tidal mudflats, with associated salt-marsh vegetation dominated by rushes. It is the least modified of the large estuaries in Canterbury, and is valued for fisheries, wildlife, and recreation. The estuary is regionally important as a whitebait spawning area and fishery, and also supports recreational fisheries for eels, flounder, trout, kahawai, yellow-eyed mullet, and a small run of quinnat salmon.

60. Hydra Waters (Rakaia) (S73 840900-840895; 850900-850895) (A)
The Hydra Waters comprise about 200 ha of tussock swampland, a type of ecosystem which is rare in North Canterbury, and are very important as a quinnat (chinook) salmon, rainbow, and brown trout spawning area for the Rakaia catchment. The waters are included in the draft Rakaia River National Water Conservation Order. They are also protected by a QEII Open Space Covenant, and it is proposed that the area be totally enclosed by a fence to prevent damage by stock. Criteria 4, 6, 7, 9, 10.

61. Avon-Heathcote Estuary (M36 880396) (C)
The area of this estuary is about 7.8 km^2, and roughly 75% of this is tidal mudflats. It provides an extensive habitat for rearing and spawning of marine and freshwater fish species, and is a feeding area for migratory adults.

62. Lower Hororata River (L36 322352) (A)
This area supports a population of Canterbury mudfish, and fisheries staff have recommended to the Department of Lands and Survey that it be a reserve. Criteria 1, 4, 7.

63. Lake Forsyth (M36 900120) (B)
Lake Forsyth is a traditional Maori fishing reserve, and it carries stocks of eels, lamprey, perch, and brown trout.

64. Lake Ellesmere and associated wetlands (M37 598058-815137) (A)
Lake Ellesmere is a large, shallow, coastal lake, covering an area of about 20 000 ha, with an average water depth of 1-2 m. The lake has no natural, continuous outlet to the sea, but is opened artificially by the North Canterbury Catchment Board when its level exceeds 1.05 m a.m.s.l. in summer and 1.13 m a.m.s.l. in winter. The lake supports commercial eel and flounder fisheries, a recreational whitebait fishery, and a traditional Maori eel fishery (especially at Taumutu and Kaituna). The commercial eel fishery accounts for up to 30% of the total New Zealand catch. Historically, the lake has also supported important fisheries for brown trout and yellow-eyed mullet, but catches of these have declined in recent years. The lake is currently the subject of a National Water Conservation Order application, but under the current legislation, the wetlands cannot be included in any Order which may be granted. Kaitorete Spit, which separates the lake from the sea, is a

Scientific Reserve, and Yarrs Flat and Harts Creek, on the inland shores of the lake, are Government Purpose (Wildlife Management) Reserves. Harts Creek is also a Wildlife Refuge. Criteria 5, 7, 8.

65. Coopers Lagoon (M37 541043) (C)
Coopers Lagoon is tidal, with adjoining swampland and a seaward sandspit, and its outlet often blocks. It is a whitebait spawning area and fishery, and also supports populations of eels, lamprey, and trout. The lagoon was gazetted as a Government Purpose (Wildlife Management) Reserve by the Wildlife Service in 1970.

66. Wairuna Lagoon (S103 120850) (C)
Wairuna Lagoon is an estuarine wetland which is unusual in that it is not connected to a river mouth. It supports an eel fishery and a moderately important trout fishery, and common native fish species are present.

67. Orari Lagoon (K38 834623) (C)
This lagoon covers 4.5 ha of tidal open water, with emergent native grasses and sedges. It supports brown trout and whitebait fisheries, and provides good spawning habitat for inanga.

68. Opihi Lagoon (K38 783573) (C)
The Opihi Lagoon supports recreational fisheries for whitebait and brown trout, and a commercial fishery for eels, as well as providing spawning habitat for inanga.

2.11 Waitaki Valley

69. Wolds Swamp (S100 970875) (A)
The tributary streams of Wolds Swamp are valuable spawning areas for brown and rainbow trout from the Tekapo River and Mary Burn. The wetland supports an abundant population of koaro, as well as long-finned eels and upland bullies, and has a diverse fauna of benthic invertebrates. It is the largest unmodified wetland in the McKenzie Basin and is very important for water retention. Criteria 5, 7, 10.

70. Cattleyard Swamp (S99 577890) (B)
This wetland area near the confluence of the Dobson and Hopkins Rivers provides stable spawning and rearing habitat for brown and rainbow trout from Lake Ohau.

71. Temple Swamp (S99 540838-548800) (B)
Temple Swamp is a valuable spawning area for brown and rainbow trout from Lake Ohau.

72. Red (S108 606595), Raupo, (S108 583606), and Swan (S108 626605) Lagoons (C)
These lagoons contain stocks of brook char and rainbow trout, and are good examples of high country tarns.

73. Ben Avon (S108 369548) and Horseshoe (S108 372539) Lagoons (B)
These lagoons contain stocks of large brown trout, and have much value for recreational anglers. Because wetlands (including swamps, marshes, and bogs) are not specifically included in the draft National Water Conservation Order for the Ahuriri River, it may be appropriate to include the Ahuriri River and all of its associated wetlands in the Schedule to ensure that they are protected.

74. Willowbank Swamp (S109 675440) and Ben Omar Swamp (S109 720435) (C)
These 2 swamps are fairly unmodified wetlands in the Ahuriri catchment. Their outlet streams are important for trout spawning and rearing, and probably have other fisheries values.

75. Berwen Swamp (S116 555303) (B)
Berwen Swamp is vital for maintaining the flow in Omarama Stream, which is a valuable dry fly fishery, and is used for spawning by rainbow and brown trout from the Ahuriri River.

76. Wainono Lagoon (J40 640100) (B)
Wainono Lagoon is a shallow, flax-raupo lagoon, with adjoining swampland and a seaward spit of unconsolidated sand. The outlet often blocks, which makes the water vary in depth. It is an important area for whitebait spawning and rearing, and the outlet channel is particularly valuable for spawning. It also supports populations of smelt, eels, and lamprey. It has recently been gazetted as a Government Purpose (Wildlife Management) Reserve by the Wildlife Service.

77. Willowbridge (Buchanans) Creek (S128 676053) (C)
This area supports a population of Canterbury mudfish.

78. Lower Waitaki River, south bank (S128 685852) (C)
This area is probably important for inanga spawning, because it is the

only remaining part of the Waitaki catchment which has potential for whitebait spawning.

79. Kakanui Estuary (J42 446558) (C)
The Kakanui estuary supports recreational fisheries and a diversity of marine and freshwater fish species.

2.12 Otago

80. Upper Taieri River and associated wetlands (S135 770535) (B)
This area has been able to support a unique recreational fishery for brown trout because of the low gradient and sinuous nature of the river channel and its associated lagoons and oxbows. The Otago Catchment Board's "channel improvement scheme" has had some harmful effects, and the present status of the wetland is uncertain.

81. Shag Estuary (J43 388232) (B)
This long estuary has large areas of salt-marsh and tidal flats which support recreational fisheries for whitebait and trout, as well as providing habitat for estuarine species such as flounder, mullet, and stargazers. The area is also an important wildlife habitat, and contains archaeological sites.

82. Waikouaiti Estuary (I43 272055) (C)
This area supports recreational fisheries for trout, whitebait, mullet, and flounder. Several tidal arms have been reclaimed since the 1950s. Merton tidal arm was gazetted as a Government Purpose (Wildlife Management) Reserve in 1980.

83. Blueskin Bay (I/J44 217950) (A)
This large, shallow estuary supports a diversity of fish species, including 3 species of flounder, brown trout, kahawai, and numerous marine species. Inanga, giant bullies, common smelt, short-finned eel, and torrentfish have been recorded in the tidal reaches of Orokonui Stream and Careys Creek which drain into the estuary. Blueskin Bay also supports a range of bird species, including waterfowl, waders, and shags. Criteria 2, 4, 5, 6, 7.

84. Otago Peninsula Estuaries (I/J44 165770-326890) (A)
Several broad, shallow estuaries and estuarine areas, including Papanui

Inlet, Hoopers Inlet, and Tomahawk Lagoon, and areas of Otago Harbour such as Aramoana Spit, support a diversity of marine, estuarine, and freshwater fish species, as well as providing important wildlife habitat. Several localities around the peninsula are protected natural areas. Those of value to fisheries include Little Hoopers Inlet and Tomahawk Lagoon, which are both Government Purpose (Wildlife Management) Reserves. Criteria 4, 5, 6, 7.

85. Lakes Waihola and Waipori and associated wetlands (H45 813600 - 866678) (A)

This large, tidally-influenced, coastal lake and wetland complex supports a whitebait fishery, a commercial eel fishery, and a recreational perch and brown trout fishery. Both lakes contain populations of giant kokopu, banded kokopu, inanga, long- and short-finned eels, bullies, common smelt, lamprey, flounder, mullet, perch, and brown trout. Lake Waipori has been gazetted as a Government Purpose (Wildlife Management) Reserve since 1978. Criteria 1, 2, 3, 4, 5, 6, 7.

86. Lake Tuakitoto (H46 648374) (A)

Lake Tuakitoto supports a commercial eel fishery, as well as recreational fisheries for brown trout and perch. Populations of giant kokopu are to be found in 2 of its tributary streams. It is a good example of a lowland coastal freshwater wetland, and is one of the few remaining large wetlands in Otago, as well as being the only major wetland remaining in the Clutha catchment. It is currently the subject of a National Water Conservation Order application. Criteria 7, 10.

87. Tokomairiro Estuary (H46 817394) (C)

This long estuary is bordered by slightly terraced tidal flats of salt-marsh, flax, and sedges. It supports a diversity of estuarine and freshwater fish, including brown trout, inanga, koaro, common smelt, long- and short-finned eels, lamprey, common and red-finned bullies, mullet, 3 species of flounder, spotty, and blue moki.

88. Puerua Estuary (Clutha River mouth) (H46 638244) (B)

The Puerua estuary is formed from a coastal spit of unconsolidated sand, which has forced the Clutha River to change its course. Its large area supports a diversity of fish species including giant bullies, black flounder, yellow-eyed mullet, kahawai, brown trout, common smelt,

inanga, giant kokopu, both eel species, and perch. It has recreational fisheries for whitebait and flounder, and may also be important for juvenile salmon rearing. The estuary was gazetted as a Government Purpose (Wildlife Management) Reserve by the Wildlife Service in 1974.

89. Catlins River Estuary (H47 570095) (B)
This estuary, known also as "Catlins Lake", provides an important spawning and rearing area for marine and freshwater fish species. It supports recreational fisheries for brown trout, whitebait, and flounder, and is a whitebait spawning area. A small area on the banks of the lake is gazetted as a Scenic Reserve. At Manuka Point, 3 km from the river mouth, an archaeological site contains the remains of extinct goose and swan, and this also is gazetted as a Scenic Reserve.

90. Waikawa Harbour (G47 140820) (C)
This large, open estuary supports recreational fisheries for whitebait and flounder. Commercial eel fishing has been reported in the past. It is also an important wildlife habitat. A low headland with steep slopes overlooking the harbour has been gazetted as a Scenic Reserve since 1905.

91. Lakes Vincent (F47 896937), Brunton (F47 950872), Cook (S185 740740), Charles (S183 790762), and The Reservoir (S183 705735) (B)
These small dune lakes are important wildlife habitats. The fisheries values of Lakes Cook and Charles, and The Reservoir are not known, but Vincent and Brunton carry significant populations of giant kokopu, and support small commercial eel fisheries.

2.13 Southland

92. Mataura River Estuary (Fortrose) (F47 873955) (A)
The Mataura estuary, including the tidal reaches of Titiroa Stream, covers 2.8 km^2 of tidal mudflats, and 18 fish species have been recorded there (Riddell *et al.* in press). The estuary supports a whitebait fishery of national importance, with 250 stands being registered in 1986. The Mataura River is a nationally important brown trout fishery (Teirney *et al.* 1984), and the lower reaches are an important rearing area for adults. The estuary also supports a popular flounder fishery, and is a rearing area for marine fish, particularly flatfish. Criteria 2, 4, 6, 9.

93. Waituna Lagoon and associated wetlands (F47 725958) (A)
This lagoon covers 3486 ha, and is open to the sea only periodically. When the outlet is closed, the water level and temperature tend to rise; when the outlet is open, the lagoon is tidal. The lagoon supports a large population of sea-run brown trout and its tributaries provide extensive trout spawning gravels. It also contains populations of giant kokopu, banded kokopu, inanga, and long-finned eels, among other estuarine and freshwater fish species (Riddell *et al.* in press). There are minor recreational fisheries for flounder and whitebait, and a brown trout trophy fishery of regional importance. The area has been identified as a "wetland of international importance" by the IUCN. It has also been gazetted as a Scientific Reserve by the Department of Lands and Survey since 1983, and part of the area of swamp forest and peat bog has been a Scenic Reserve since 1947. Criteria 1, 2, 3, 4, 5, 7, 10.

94. New River (Invercargill) Estuary (E/D47 515050) (A)
The New River estuary is the largest in Southland, covering roughly 25 km^2, with about 65 km of tidal waters. It is Southland's most important habitat for waders and other water birds. The estuary provides extensive rearing and spawning habitat for marine and freshwater fish species. It is a popular area for trout fishing, and brown trout up to 11.5 kg in weight are caught there regularly, particularly in the Oreti arm of the estuary. Whitebaiting occurs on the river arms of the estuary, and again the Oreti is the most popular. There are also recreational fisheries for flounder (using nets and spears), eels, and mullet. Criteria 2, 4, 6, 7.

95. Jacobs River Estuary (D46 255178) (A)
The Jacobs River estuary is formed by the confluence of the Pourakino and Aparima Rivers, and covers about 7 km^2, with about 18 km of tidal waters. An important local commercial fishing fleet is based at the estuary entrance. Whitebaiting is the dominant recreational activity, and most of the stands are on the Aparima arm. Many whitebaiters also fish for trout, because this is a rearing area for brown trout, and sea-dwelling trout pass through the estuary during summer and autumn en route to their spawning grounds. There are also recreational fisheries for yellow-eyed mullet, black flounder, and kahawai, and cockles are collected from shellfish beds in the main part of the estuary. Criteria 2, 4, 6, 7.

96. Lake George and "Henderson" Extension (D46 143155) (A)
Located in swamp forest, with sedges and flaxes, the Lake George wetland complex has an area of 283 ha. It is a remnant of what was once a vast peat swamp. The wetland is low-lying, about 1 km from the coast, and drains into the sea via Ourawera Stream. The area supports a substantial population of giant kokopu, a species which is now rare in most parts of New Zealand. The "Henderson" extension has been gazetted as part of the Lake George Wildlife Management Reserve. Criteria 1, 3, 4, 6, 7.

97. Waiau River (Te Wae Wae) Lagoon (D46 963310) (B)
Te Wae Wae Lagoon is a narrow estuary, about 6 km long and 0.25 km wide, on the shores of Te Wae Wae Bay. Its fish species are typical of those found in other Southland estuaries, except that, occasionally, rainbow trout and, rarely, Atlantic salmon are found in the tidal and lower reaches of the Waiau River. The whitebait fishery is locally important, and differs from others in Southland in that only scoop nets are used. Flounder and mullet are also sought. Brown trout fishing is popular in the estuary, and locals report a high catch rate of 3-4 fish per hour.

98. Unnamed Tributary of Lake Poteriteri (S166 350325) (B)
This wetland area contains populations of lamprey and giant kokopu.

3. DISCUSSION

Over the past 5 years, several lists of nationally important rivers and lakes have been compiled by recreational user groups and the National Water and Soil Conservation Organisation (Egarr and Egarr 1981a, b, c; Anon. 1982; Teirney *et al.* 1982; Grindell 1984; Grindell and Guest 1986). Until recently, no attempt has been made to compile a comparable list of nationally important wetlands, although the Wetlands Task Group (1983) have proposed criteria for assessing wetland values (Appendix III). It could be said that this country's outstanding wetlands need not be identified. However, New Zealand's wetland resources have diminished greatly, and very few of those remaining are still in their natural state; the Nature Conservation Council (1981) estimated that less than 10% of our remaining wetlands are unmodified.

Therefore, it could be stated, with some justification, that all of New Zealand's wetlands now need to be conserved.

However, such a generalisation inevitably leads to the question of the definition of the term "wetland". Such a discussion is beyond the scope of this report, and the reader is referred to the Wetlands Task Group (1983) for elaboration. Nevertheless, the problem of term definition led to some overlap between the list of rivers and lakes compiled by the PWAC (Grindell and Guest 1986), and that of wetlands nominated by MWD officials for inclusion in the Schedule of Protected Waters (Appendix IV). For example, many lakes have extensive wetland margins which are an integral part of the lake ecosystem and contribute to the overall value of the waterbody. Similarly, it is common for estuaries to have tidally-influenced wetland areas. In an attempt to overcome the problem of term definition, the MWD paper submitted to Cabinet has recommended that the inland wetland margins of rivers and lakes listed on the Schedule be included for protection if they have high amenity values. Thus, whether or not the Government decides to include wetlands in the Schedule, those associated with rivers or lakes listed in the Schedule would receive interim protection.

The recent report by the Environmental Council (1987) to the Minister for the Environment highlighted the fact that wetlands throughout the country are under threat, and that changes are required urgently to improve the situation. In particular, their report noted the need to rationalise the 2 principal acts controlling the use of water: the Soil Conservation and Rivers Control Act (1941), and the Water and Soil Conservation Act (1967). The former promotes drainage to increase agricultural production, and it is untenable that drainage subsidies are not to be phased out until 1990. Also, regional water boards are confused about the necessity or otherwise of water rights for drainage.

Many of the 75 submissions to the Environmental Council advocated that the water conservation order procedures be extended to include wetlands. In addition, it was widely recommended that the Schedule of Protected Waters include nationally important wetlands. Among their recommendations to the Minister, the Council suggested "that the Government urgently advance consolidated water and soil legislation which contains:

- consolidation of the 2 acts;
- statutory recognition of water and soil planning;
- inclusion of wetlands within the criteria of Conservation Orders and Notices;
- clarification of the water rights required for drainage of wetlands;
- penalties sufficient to ensure adequate protection."

In considering waterbodies for inclusion in the Schedule, MWD officials decided to exclude those for which applications for Water Conservation Orders had been lodged. At the time of writing, there have been 9 applications for National Orders, 3 applications for Local Notices, and 4 applications which have not specified the type of protection being sought (Table 3). The main distinction between National Orders and Local Notices is that the former binds the Crown, whereas the latter does not. Although the principle of excluding waterbodies under consideration for protection is accepted, it is likely that the wetlands associated with them will not receive the level of protection that they deserve because the current legislation excludes wetlands from consideration. A case in point is the Lake Wairarapa application, where the many "associated wetlands" (see Section 3.6, No. 34) are not included in the draft National Water Conservation Order, and have not been included by the MWD officials preparing the wetland nominations for the Schedule. Similar difficulties apply to the Ahuriri River and Lakes Tuakitoto and Ellesmere applications.

Estuaries require special consideration, and it is acknowledged that they have not been dealt with adequately either in this report or in the overall consideration of waterbodies for inclusion in the Schedule. Because they lie where fresh and salt water meet, estuaries generally provide important spawning, feeding, and rearing areas for both marine and freshwater fish species, as well as allowing passage for migratory freshwater fish species which spend part of their life cycle at sea. Estuaries are usually characterised by high species diversity, productivity, and recreational use, and, as a whole, are scientifically and biologically valuable. However, fisheries features and values of estuaries throughout the country have not been well documented, and they have not been considered fairly in the process of ranking waterbodies (see Section 3). Ideally, they should be considered in a category of their own. The Department of Conservation has now assumed

responsibility for promoting conservation values in the management of the coastal zone, and coastal resources, including estuaries, should be protected more actively in the future.

This report has identified 101 individual wetlands or groups of waterbodies which have outstanding fisheries values. Of these, 41 qualified for an A-ranking, 41 for a B-ranking, and 19 for a C-ranking. All of the A-ranked waterbodies were recommended to the MWD officials for inclusion in the Schedule of Protected Waters, and those from the B and C lists were suggested for inclusion if other natural values (e.g., botanical, wildlife) were also high. However, the list of wetlands approved for inclusion in the Schedule which was forwarded to Cabinet (Appendix IV) contained only 9 waterbodies from the A list, 3 from the B list, and 2 from the C list.

Fisheries staff wrote to MWD expressing concern at the lack of nominations of wetlands with fisheries values. As a result, MWD officials agreed to include an additional paragraph in their paper to

TABLE 4. Additional wetlands nominated by the Freshwater Fisheries Centre for inclusion in the proposed Schedule of Protected Waters

North Island
Kaimaumau Swamp and associated wetlands (Motutangi and Kaikino)
Hikurangi Swamp
Mangaparo (Clarkes) Swamp
Mangatawhiri Swamp
South Island
Whanganui (Westhaven) Inlet
Birchfield Swamp
Orowaiti Estuary and associated wetlands
Hermitage Swamp
Okuru/Turnbull/Hapuka Lagoon
New River (Invercargill) Estuary

Cabinet, identifying 10 further wetlands (Table 4) which could be considered by the politicians for inclusion in the Schedule.

The paper was considered by the Cabinet Development and Marketing Committee in February 1987. They decided to defer any consideration of the Schedule of Protected Waters until the Water and Soil Conservation Bill comes before Parliament for revision. This may not happen for 2 or 3 years (1989-90), and in the meantime, there is to be no resolution of the content or intent of the proposed Schedule. It is to be hoped that, when the matter finally comes before Cabinet for a decision, the protracted and intense effort put into compiling the lists to be proposed for inclusion in the Schedule will not be ignored, and that the process will not be repeated unnecessarily.

4. ACKNOWLEDGMENTS

I sincerely thank the many acclimatisation society field officers from throughout New Zealand, together with staff from MAFFish, who contributed to this report at very short notice. The assistance of Greg Kelly in obtaining map references and drafting the maps is also gratefully acknowledged.

5. LITERATURE CITED

Anderson, R., Hogarth, I., Pickard, R., and Ogle, C. 1984. Loss of wildlife habitat in Northland 1978-83. *N.Z. Wildlife Service, Technical Report No.6.* 46 p.

Anon. 1982. A draft for a national inventory of wild and scenic rivers. Part I. Nationally important rivers. *Water and Soil Miscellaneous Publication No. 42.* 64 p.

Buchanan, I. n.d. The Lake Wairarapa wetlands wildlife habitat. Report to Wellington Acclimatisation Society. 20 p.

Commission for the Environment. 1986. "New Zealand Wetlands Management Policy." 8 p.

Department of Lands and Survey. 1984. "Register of Protected Natural Areas in New Zealand." Government Printer, Wellington. 468 p.

Egarr, G.D., and Egarr, J.H. 1981a. New Zealand recreational river survey. Part I. Methods and conclusions. *Water and Soil Miscellaneous Publication No. 13.* 68 p.

Egarr, G.D., and Egarr, J.H. 1981b. New Zealand recreational river survey. Part II. Summaries of North Island rivers. *Water and Soil Miscellaneous Publication No. 14.* 128 p.

Egarr, G.D., and Egarr, J.H. 1981c. New Zealand recreational river survey. Part III. Summaries of South Island rivers. *Water and Soil Miscellaneous Publication No. 15.* 160 p.

Environmental Council. 1987. New Zealand Wetlands Management Policy. A report to the Minister for the Environment. 14 p.

Grindell, D.S. (Ed.) 1984. A national inventory of wild and scenic rivers. *Water and Soil Miscellaneous Publication No. 68.* 23 p.

Grindell, D.S., and Guest, P.A. (Eds.) 1986. A list of rivers and lakes deserving inclusion in a Schedule of Protected Waters: Report of the Protected Waters Assessment Committee. *Water and Soil Miscellaneous Publication No. 97.* Unpaged.

McDowall, R.M., and Richardson, J. 1983. The New Zealand freshwater fish survey: Guide to input and output. *N.Z. Ministry of Agriculture and Fisheries, Fisheries Research Division Information Leaflet No. 12.* 15 p.

Nature Conservation Council. 1981. "Integrating Conservation and Development. A Proposal for a New Zealand Conservation Strategy." Government Printer, Wellington. 64 p.

Nature Conservation Council. 1982. Are we pulling the plug on wetlands? *Nature Conservation Council Newsletter No. 48:* 1-3.

Riddell, J.M., Watson, N.R.N., and Davis, S.F. (in press). Fisheries investigations of the Ashers-Waituna, Benhar, and Hawkdun lignite deposit areas. *N.Z. Freshwater Fisheries Report.*

Simpson, P. 1985. "WERI": A plug for protection. *The Landscape 25:* 5-9.

Strickland, R.R. 1980. Fisheries aspects of the Whangamarino Swamp. *N.Z. Ministry of Agriculture and Fisheries, Fisheries Environmental Report No. 7.* 37 p.

Strickland, R.R. 1985. Fisheries aspects of the Taharoa lakes and Wainui Stream. *N.Z. Ministry of Agriculture and Fisheries, Fisheries Environmental Report No. 66.* 48 p.

Teirney, L.D., Unwin, M.J., and Richardson, J. 1984. The relative value of Southland rivers to New Zealand anglers. *N.Z. Ministry of Agriculture and Fisheries, Fisheries Environmental Report No. 50.* 90 p.

Teirney, L.D., Unwin, M.J., Rowe, D.K., McDowall, R.M., and Graynoth, E. 1982. Submission on the draft inventory of wild and scenic rivers of national importance. *N.Z. Ministry of Agriculture and Fisheries, Fisheries Environmental Report No. 28.* 122 p.

Thompson, F.V. 1986. Notes on the black mudfish *Neochanna diversus,* (stokell) (sic). *Auckland Acclimatisation Society 119th Annual Report:* 32-38.

Wetlands Task Group. 1983. Wetlands: A diminishing resource (A report for the Environmental Council). *Water and Soil Miscellaneous Publication No. 58.* 62 p. and appendices.

APPENDIX I. Schedule of Protected Waters : Draft Legislation.

The latest draft (October 1986) of S 175 of the Water and Soil Conservation Bill, which implements "interim protection" for water bodies listed on the Schedule, reads as follows:

1. When any water body is included in a schedule of protected waters under this Act, or lies within a national park, no water right shall be granted and no general authorisation shall be made in respect of any water anywhere within the catchment of that water body which, when added to all rights and authorisations current at the date of introduction of this bill, results in:

   a) The damming of the full flow of any river or stream which is included in the Schedule or lies within a national park; or

   b) An alteration of more than 10% in the instantaneous flow of a river or stream which is included in the Schedule or lies within a national park; or

   c) A significant change in the course of a river or stream which is included in the Schedule or lies within a national park; or

   d) A change in the minimum or maximum water levels in a lake or wetland which is included in the Schedule or lies within a national park; or

   e) A change in the area of a lake or wetland which is included in the Schedule or lies within a national park; or

   f) Any deterioration in water quality which would detract significantly from the wild, scenic, or other natural characteristics or the recreational, fisheries, wildlife habitats, scientific, or other features or values of or associated with any river, stream, lake, or wetland which is included in the Schedule or lies within a national park; or

   g) Any change in an inland wetland adjacent to a river, stream, or lake which is included in the Schedule or lies within a national park which would detract significantly from the wild, scenic, or other natural characteristics or the recreational, fisheries, wildlife habits, scientific, or other features or values of or associated with that river, stream, or lake; or

   h) Any significant change in the natural character of a river, stream, lake, wetland, or geothermal area which is included in the Schedule or lies within a national park.

APPENDIX II. IUCN criteria for selecting wetlands of international importance. Meeting any one criterion enables a wetland to qualify. (From Appendix 7, Wetlands Task Group, 1983).

1973 Criteria

1. The wetland is a particularly good example of a specific type of water-dependent biotic community found in the climatic zone concerned.

2. The wetland is a critical habitat for certain animals or plants (or in some cases certain animal and plant communities), the existence of which depends on preserving the ecological characteristics of the wetland.

3. The wetland has high productivity, producing and supporting (or capable of producing or supporting) large numbers of animals and plants, especially those which are threatened with extinction.

4. The wetland is of high value to aquatic birds or mammals (whether resident or migratory) as a breeding, staging, feeding, moulting or wintering area.

5. The wetland is the outstanding or sole site in a region on which breeding populations of fish, amphibians, reptiles, crustaceans, molluscs or other aquatic species depend, or on which terrestrial species, particularly birds and larger mammals, depend for water supply, or on which certain plants or plant communities depend.

6. The wetland is an outstanding area for research, as a demonstration area (either natural or artificial) where management practices can be shown and studied, as an outdoor laboratory for nature or ecological studies, or for conservation education.

7. The wetland has scenic, aesthetic, scientific, educational, recreational or sporting values which are, potentially or actually, a great attraction for visitors and tourists from other countries.

8. The wetland is an important area to two or more countries.

1981 Revised Criteria

1. Quantitative criteria for identifying wetlands of importance to waterfowl.

   A wetland should be considered internationally important if it:

   (a) regularly supports either 10,000 ducks, geese and swans: or 10,000 coots; or 20,000 waders; or

   (b) regularly supports 1 percent of the individuals in a population of one species or subspecies of waterfowl; or

(c) regularly supports 1 percent of the breeding pairs in a population of one species or subspecies of waterfowl.

2. General criteria for identifying wetlands of importance to plants or animals.

A wetland should be considered internationally important if it:

(a) supports an appreciable number of a rare, vulnerable or endangered species or subspecies of plants or animal; or

(b) is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna; or

(c) is of special value as the habitat of plants or animals at a critical stage of their biological cycles; or

(d) is of special value for its endemic plant or animal species or communities.

3. Criteria for assessing the value of representative or unique wetlands.

A wetland should be considered internationally important if it is a particularly good example of a specific type of wetland characteristic of its region.

APPENDIX III. Criteria for assessing wetland conservation values. (From Appendix 5, Wetlands Task Group, 1983).

1. a) Those already ratified under the International Wetlands Convention. They are Farewell Spit (Nelson) and Waituna Lagoon (Southland). These are not necessarily our "best" wetlands, but our commitment to conserving them is high because of their international designation.

   b) Those having exceptional values in providing a habitat for rare or endangered indigenous (and especially endemic) flora and fauna, or for migratory birds of global significance (i.e., wetlands which might qualify as of international significance).

2. Those having high scientific values for diversity of wetland organisms or habitats, or for representativeness (e.g., in relation to Ecological Regions and Districts) or naturalness (e.g., Maungatua cushion bogs in eastern Otago) or for the preservation of pollen records of past vegetation and associated climate (e.g., Freestone Hill bog near Manapouri) or archaeological importance. A distinction between local, regional, and national significance may be appropriate.

3. Those with high value for unique or special geomorphological or hydrological features (e.g., Lammerlaw and Lammermoor Ranges in Otago). (We would comment that in the case of the Kepler Mire, it is so remarkable as to warrant a much higher rating.)

4. Those having value as spawning grounds for one or more species of commercial fish - whitebait (e.g., Tawharekiri Lakes, South Westland), flat fish (e.g., Aramoana salt-marsh, Otago), oysters (e.g., Mahurangi estuary) etc.

5. Those with scenic or landscape values of distinctive quality (e.g., Parengarenga Harbour, Northland, and Sinclair's Swamp, Waihola, Otago).

6. Those which have, or with potential for, high recreational values, such as game bird shooting, especially where the wetland is of special regional or national significance (e.g., Lake Wairarapa).

7. Those with sustainability in relation to size as well as the condition and security of contributing catchment(s) (e.g., Lake Ellesmere).

APPENDIX IV. Wetlands recommended to Cabinet by the Ministry of Works and Development for inclusion in a Schedule of Protected Waters

NORTH ISLAND

A FRESHWATER WETLANDS

1. Ahipara Wetland. South end of Ninety Mile Beach, about N9:700650.

2. Kaitoke Swamp. East side of Great Barrier Island, about N30:935378 to N30:978358.

3. Medlands Beach. East side of Great Barrier Island, about N30:986325.

4. North Manukau head, including all tributaries of Whakatipu Stream and Karekare Stream, and the lakes and swamps between.

5. Whangamarino Wetland. East of Meremere and Te Kauwhata, including parts of Maramarua River (N52:574068 to N52:667090) and its tributaries, and the Whangamarino River and its tributaries from its junction with the Maramarua River to N52:692005.

6. Kopuatai Peat Dome. West of Piako River and generally bounded by Elstow Canal, Tee Canal, Awaiti Road, Paeroa Road, Waitoa Canal, Patetonga Canal, and the Piako River.

7. Arahaki Lagoon. About N95:110337, on the Waiatiu Stream, a tributary of the Whirinaki River.

8. Reporoa Bog. At the head of the Taruarau River, about U21:775176.

9. Pekapeka Swamp. South of Hastings near Te Hauke, about N141:160065.

10. Lake Poukawa. South of Hastings near Te Hauke, at N141:127040.

11. Lake Papaitonga Bush. South of Horowhenua, an area of wetland associated with Lake Papaitonga, about N152:750000.

12. Taupo Swamp, Plimmerton. Between the Auckland-Wellington railway line and State Highway 1, about N160:425485.

13. Lake Onoke. Between Lake Wairarapa and the coast, about N165:660106.

B ESTUARINE WETLANDS

1. Parengarenga Harbour. On the east coast of North Cape. All of the tidal area out to Ohao Point (north head N2:498418) and Koteoneporo Spit (south head N4:050397).

2. Rangaunu Harbour. All of the tidal area to the Heads (N7:785996 (Blackney Point) and N7:763971), including the dunes and swamp behind Otiaia Point (N7:782958), but excluding the sand ridges of Kiwi Flat, about N7:835905.

3. Helena Bay Swamp. West of Mimiwhangata Bay (Northland). A small area, about N16:8743141, also known as Teal Bay.

4. Firth of Thames. The tidal mudflats from Maiaua to the Waihou River mouth.

5. Kawhia Harbour. Near Te Awamutu, south of Raglan Harbour. All of that area of mud and sandflat, saltrush and reed swamp and tidal reaches out to Opapaka Point (N73:304512) and its opposite point (N73:310104).

6. Ahuriri Estuary. Near Napier. From the breakwater entrance (N124:312407) to the road ends (N124:242452) (N124:260478) and (N124:269478).

7. Manawatu River Mouth. West of Foxton, including the old oxbow to N148:788217 and the Whirokino Cut to State Highway 1 (N152:794159), and seaward to points north N148:734213 and south N148:732200.

SOUTH ISLAND

A FRESHWATER WETLANDS

1. Tiropahi Pakahi. Around Tiropahi or Four Mile River south of Charleston. Between about S30:961455 and S30:991413, and including the lower reaches of Waggon Creek.

2. Groves and Harmon Swamp. Swamp on the edge of the Hokitika River east of Ruatapu. S57:515398 to S57:380500 including Pukaki Lagoon, Tukes Lagoon, Lords Lagoon, and the middle reaches of Shooting Creek.

3. Okarito Lagoon. Near Harihari and south of Waitangi-roto River.

4. Maori Lakes Complex. The lake, swamp, and coastal beach complex bounded by the sea, the Haast River, and Coppermine Creek.

5. Burmeister Morass. Between Haast and Port Jackson, including Dismal Swamp.

6. Big Lagoon, Tekapo. South of Mt Hay Station, about S90:162016 to S90:167008.

7. Swan Lagoon. Immediately south of Lake Ohau, about S108:627607.

8. Old Man Range Wetland. On the Old Man Range, about S134:035205.

9. Ararua Bog and Seaward Mors. The wetland area around Awarua Bay, Southland.

B ESTUARINE WETLANDS

1. Waimea Inlet. West of Nelson between Tahunanui (S20:590288) and Mapua (S14:473328), and including the estuary all around Rabbit, Bells, and Bests Islands.

2. Aramoana Salt Marsh. A large bar-built wetland at the mouth of Otago Harbour, about S164:315829.

STEWART ISLAND

1. Freshwater Flats. Northern Stewart Island including Scott Burn, Forked Creek, Lake Sheila, Double Lakes, and all that nearby land generally below the 20-m contour line.

CHATHAM ISLANDS

1. Lake Wharemanu and Lake Kaimoumi. On the northern coast of Chatham Island.

2. Cascade Gorge River, Lakes Te Rangatapu, Rakeinui, and Matangirau, which together form a complex in the southern part of the Southern Tablelands on Chatham Island.