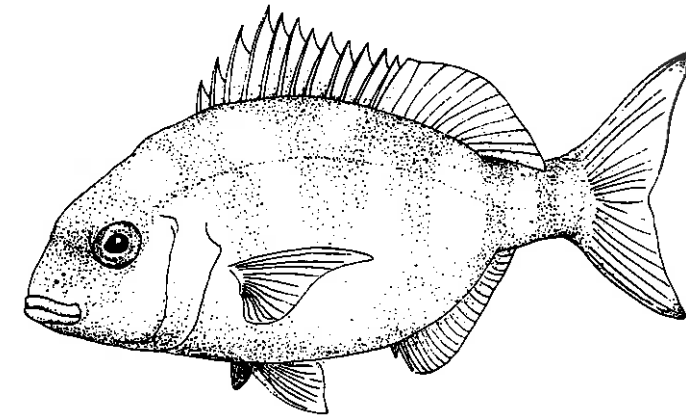


**WESTHAVEN
WHANGANUI INLET
NORTH-WEST NELSON**

**Application for a
MARINE RESERVE
and proposal for a
WILDLIFE MANAGEMENT RESERVE**



**Nelson/Marlborough Conservancy
Private Bag 5, Nelson**



**CONSERVATION
TE PAPA ATAWHAI**

PREFACE

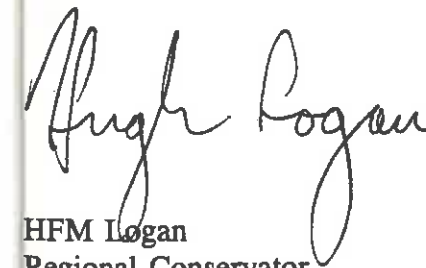
The Westhaven (Whanganui Inlet) is a special place. It is the largest relatively unmodified estuary in New Zealand. As such, it retains many of the elements of New Zealand's original estuarine and coastal ecological systems. Westhaven (Whanganui Inlet) is worthy of protection for future generations.

The Department of Conservation is presenting a formal application made under the Marine Reserves Act 1971 to establish a marine reserve in the southern part of the estuary (567 hectares). A wildlife management reserve under the Wildlife Act 1953 is proposed for the rest of the estuary (2,177 hectares) due to the outstanding ecological values.

In this way, the Department hopes to protect the estuary's habitat and species, and at the same time ensure that people are able to enjoy the recreational pursuits that take place there. In the southern arm of the estuary proposed as a marine reserve, however, there would be absolute protection for all species, including the fish.

It is significant that if successful, Westhaven (Whanganui Inlet) would be the first estuary in New Zealand to be protected using a combination of a marine reserve and a wildlife management reserve.

The Department of Conservation welcomes community involvement in the statutory process to create a marine reserve in the manner outlined in this document. In addition, comment on the proposal to establish a wildlife management reserve is also welcomed. We look forward to hearing from you.



HFM Logan
Regional Conservator
Nelson/Marlborough Conservancy

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PART I

- 1. Introduction**
- 2. Background**

1. INTRODUCTION

1.1 PROPOSAL FOR ESTUARINE PROTECTION

Since 1988, the Department of Conservation has been working towards protection of Westhaven (Whanganui Inlet). Initially the Department focused solely on the provisions of the Marine Reserves Act 1971. The proposal has evolved considerably since then. The Department of Conservation now proposes to protect the outstanding natural values of Westhaven (Whanganui Inlet) by establishing both a marine reserve and a wildlife management reserve.

This document contains:

- (1) the current section including the introduction and background (Part I);
- (2) an application by the Director-General of Conservation for a marine reserve (Part II); and
- (3) proposal for a wildlife management reserve (Part III).

Should this combination of protection be established, it would be the first of its kind in New Zealand.

The report details the nature and extent of the marine reserve application and wildlife management reserve proposal, their justification, and background and assesses the impacts of a marine reserve and wildlife management reserve on existing uses and users.

The Department seeks formal written objections on the marine reserve and your views on the wildlife management reserve. Two months are available from the date of the first publication of the notice (26 June 1993) for written objections to the marine reserve application. The Department of Conservation is also prepared to receive submissions in support of the proposed marine reserve. It is important that objections on the marine reserve are made on a separate sheet from your views on the wildlife management reserve.

1.2 MARINE RESERVE

Marine reserves are areas of the seabed, foreshore and waters which have been set aside under the Marine Reserves Act 1971 "... for the purpose of preserving, as marine reserves for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features, or marine life, of such distinctive quality, or so typical, or beautiful, or unique, that their continued preservation is of the national interest." (Section 3(1), Marine Reserves Act 1971).

The principal purpose of the Marine Reserves Act 1971 is to preserve marine areas in their natural state for the scientific study of marine life. In addition, a number of other benefits accrue from the protection of marine life, including: educational opportunities, new opportunities for recreation and tourism, potential refuge, feeding and nursery areas for unexploited marine organisms, and potential "yard sticks" for assessing the impacts or effectiveness of management of other marine areas and adjacent terrestrial and marine resources.

Marine reserves are established by an Order in Council made by the Governor General following the statutory process set out in Section 5 of the Act. This process is outlined in Appendix 1. This document meets the statutory requirements in relation to the application set out in Section 5 of the Marine Reserves Act 1971.

1.3 WILDLIFE MANAGEMENT RESERVE

A principal purpose of the Wildlife Act 1953 is to protect wildlife, particularly native birds. Under this Act, wildlife management reserves can be applied to land including areas of seabed and foreshore.

Wildlife management reserves are established by proclamation by the Governor-General subject to such conditions specified in the proclamation (Appendix 3).

1.4 CONSULTATION

Public support is essential if these types of protection are to work. The Department of Conservation has worked with tangata whenua, commercial fishers, MAF Fisheries, recreational fishers, the local community and other affected or interested parties. An advisory committee was established to facilitate development of a protected area proposal. Details of that consultation are outlined in Chapter 2.

2. BACKGROUND

2.1 ORIGIN

In 1987, the Ministry of Agriculture and Fisheries (MAF) suggested a variety of protection measures for Westhaven (Whanganui Inlet) (Rushton, 1987). From April 1987, the Department of Conservation (DOC) assumed administrative responsibility for the Marine Reserves Act 1971.

DOC commissioned a comprehensive biological investigation in 1989-90 (Davidson, 1990). The report detailed the inlet's habitats and associated flora and fauna (summarised material in Appendices 4, 5 of this document) and showed that Westhaven (Whanganui Inlet) was an estuarine area of national importance. Davidson (1990) recommended that DOC seek protection for the inlet and that two levels of protection be investigated: total protection in the southern inlet and habitat protection in the northern estuary. A MAF Fisheries report on freshwater fish in the inlet area demonstrated the importance of its natural catchments and also recommended protection of the inlet and adjacent waterways (Eldon & Ward, 1991).

In September 1989, the Department of Conservation began consultations with the public about protection for Westhaven (Whanganui Inlet) under the Marine Reserves Act 1971. A series of meetings with interest groups were held. Approximately 200 people attended a public meeting in Collingwood (25/9/89). Many local people wanted the importance of recreational fishing recognised. They expressed a lack of confidence in DOC, but generally agreed that some form of protection for the estuary was needed. This impression was confirmed by results received from a questionnaire distributed at the end of the meeting, and another pamphlet distributed more widely. All 82 individual submissions received stated that the inlet should be protected (Table 1). Some 71% of individual submissions supported the concept of a marine reserve, but 88% wanted recreational and traditional fishing accommodated. A similar trend was recorded for group submissions (Table 2).

During April 1990, a local resident was contracted to liaise between Golden Bay residents and DOC. An advisory committee of Golden Bay residents was established.

Discussions were also held separately with the tangata whenua, MAF Fisheries, Federation of Commercial Fishermen and the Royal Forest and Bird Protection Society.

TABLE 1

Results from Individual Submissions (n = 82)

Category	Protection of Westhaven (Whanganui Inlet)	Marine Reserve	Recreational and Traditional Fishing Within 'Reserve'
Support	100%	71%	88%
Opposed	0%	29%	6%
Conditional Support	0%	0%	0%
No Comment	0%	0%	6%

TABLE 2

Results From Group Submissions (n = 7)

Category	Protection of Westhaven (Whanganui Inlet)	Marine Reserve	Recreational and Traditional Fishing Within 'Reserve'
Support	71%	57%	100%
Opposed	0%	14%	0%
Conditional Support	0%	29%	0%
No Comment	29%	0%	0%

2.2 ADVISORY COMMITTEE

The advisory committee was formed to obtain the assistance of the local community in developing a workable proposal for protection of the estuarine environment.

The committee comprised of representatives active in the following local interest groups: tangata whenua; Golden Bay Community Board; farmers; Commercial Fishers; local businesses; and recreational fishers. MAF Fisheries staff participated in some meetings.

Advisory committee meetings commenced in June 1990. During meetings, social issues and conservation goals were discussed. The proposal for a fully protected zone south of Melbourne Point (Pah Point) and a habitat protection area for the remaining estuary (where recreational and traditional fishing would be allowed) evolved during this period.

Protection proposals for Westhaven Inlet described in this report are based on recommendations arising from this committee and separate discussions with key groups.

2.3 MAJOR ISSUES AND CONCERNS

A principal concern was the impact a marine reserve would have on recreational and traditional fishing. Although the Marine Reserves Act does not necessarily preclude recreational fishing within a marine reserve, there were strong objections in principle from the national staff of the Royal Forest and Bird Protection Society and the Federation of Commercial Fishermen to allow any form of recreational fishing in a marine reserve. The Department, therefore, decided after consultation with the advisory committee, to investigate other protection mechanisms for the northern inlet which would allow recreational and traditional fishing.

The recreational fishing fraternity argued strongly that the inlet north of a line between Melbourne Point (Pah Point) and the Westhaven Scenic Reserve was an important recreational fishing area. Of particular significance were tidal channels. Traditional fishing issues for the tangata whenua centred in the northern inlet for finfish and in the mouth for kina. Most interest in fishing focused on the northern inlet north of a line between Melbourne Point and Westhaven Scenic Reserve.

Traditional movement of stock around the margins of the estuary as well as limited access by farm vehicles and the launching of boats were concerns of local farmers.

PART II

3. **The Marine Reserve Application**
4. **Proposed Management of Marine Reserve**
5. **Implications for Current Uses and Users**
6. **Justification**

3. THE MARINE RESERVE APPLICATION

3.1 LOCATION AND DESCRIPTION

The sea entrance to Westhaven (Whanganui Inlet) is located 19 kilometres south-west of Farewell Spit on the west coast of the South Island (Figure 1). The inlet is a barrier enclosed, drowned river valley approximately 13 kilometres long and between 2-3 kilometres wide (2,744 hectares). As the tide enters the inlet it is divided into north-east and south-west channels. Once filled these channels spill water out onto expansive intertidal flats which dominate the estuary (72% of total estuarine area).

3.2 BOUNDARIES

The proposed marine reserve area is defined as all the tidal waters below mean high water spring, south-west of a straight line between Melbourne Point (Pah Point) and the closest point on the Westhaven Scenic Reserve and all of the estuarine embayments south of and including the Wairoa River bounded by the dry road (Fig. 1). This area covers approximately 567 hectares or 21% of the total inlet. The Mangarakau wharf is not to be included in the marine reserve.

The plan of the area is open for inspection free of charge and may be inspected at the offices set out in the formal notice of intention to apply for a marine reserve (see Appendix 2).

3.3 APPLICANT

The applicant for the marine reserve is the Director-General of Conservation. The application was prepared by the Nelson/Marlborough Conservancy of the Department of Conservation. A copy of the formal public notice of intention to apply for a marine reserve is provided in Appendix 2.

3.4 OBJECTIVES

The principal purposes of this application are:

- (i) to meet the policy and objectives of the Marine Reserves Act (1971); and
- (ii) to contribute towards the Department of Conservation's mandate to conserve and protect natural resources of New Zealand for the benefit and enjoyment of the public and establishment of a network of marine reserves.

4. PROPOSED MANAGEMENT OF MARINE RESERVE

4.1 LEVEL OF PROTECTION

The marine reserve application is for a totally protected area where no extraction or disturbance of marine life would be permitted.

4.2 ACCESS TO THE PROPOSED MARINE RESERVE

Section 3(2)(d) of the Marine Reserves Act requires that "...the public shall have freedom of access and entry to the (marine) reserves, so that they may enjoy in full measure the opportunity to study, observe and record marine life in its natural habitat" subject only to such "...conditions and restrictions as may be necessary for the preservation of the marine life or for the welfare in general of the reserves...". Section 23 of the Act, subject to any regulations that might be made, also preserves rights of access and navigation at all times within a marine reserve, the only exception being anchoring which can be controlled by regulations.

The Department of Conservation recognises the educational benefits to be derived from first-hand experience of a marine reserve and would actively promote the use of the reserve for such purposes.

4.3 MARKING OF BOUNDARIES

Under the provisions of the Marine Reserves Act, the Director General has discretion in the marking of boundaries. The seaward boundary and boundary between the proposed protected areas may not be marked because they are straight lines easily identified using dominant landmarks. Tidal boundaries around the margins of the estuary are in most areas defined as mean high-water spring (MHWS). Tidal penetration into the river arms, particularly on the south-eastern margins, is often considerable. Tidal areas of the rivers are also to be included within the proposed protected areas. In most locations this is easily recognised as the intertidal shore ends abruptly in steep banks, or can be recognised as the landward extent of salt marsh vegetation. Where potential confusion exists appropriate markers may be installed.

4.4 ENFORCEMENT AND COMPLIANCE

Policing the proposed marine reserve would be the responsibility of DOC. Assistance, however, will be required from others. These might include, subject to their willingness, commercial fishers, local residents and landowners appointed as Honorary Marine Reserve Rangers. To some extent the marine reserve would be self-policing. Experience in other areas has shown that users supportive of the concept are often strongly protective of it. Education and advocacy to generate respect for the area and an understanding of the rules would also help to ensure compliance. DOC would advertise the existence of the marine reserve, its significance, and restrictions which apply to the area.

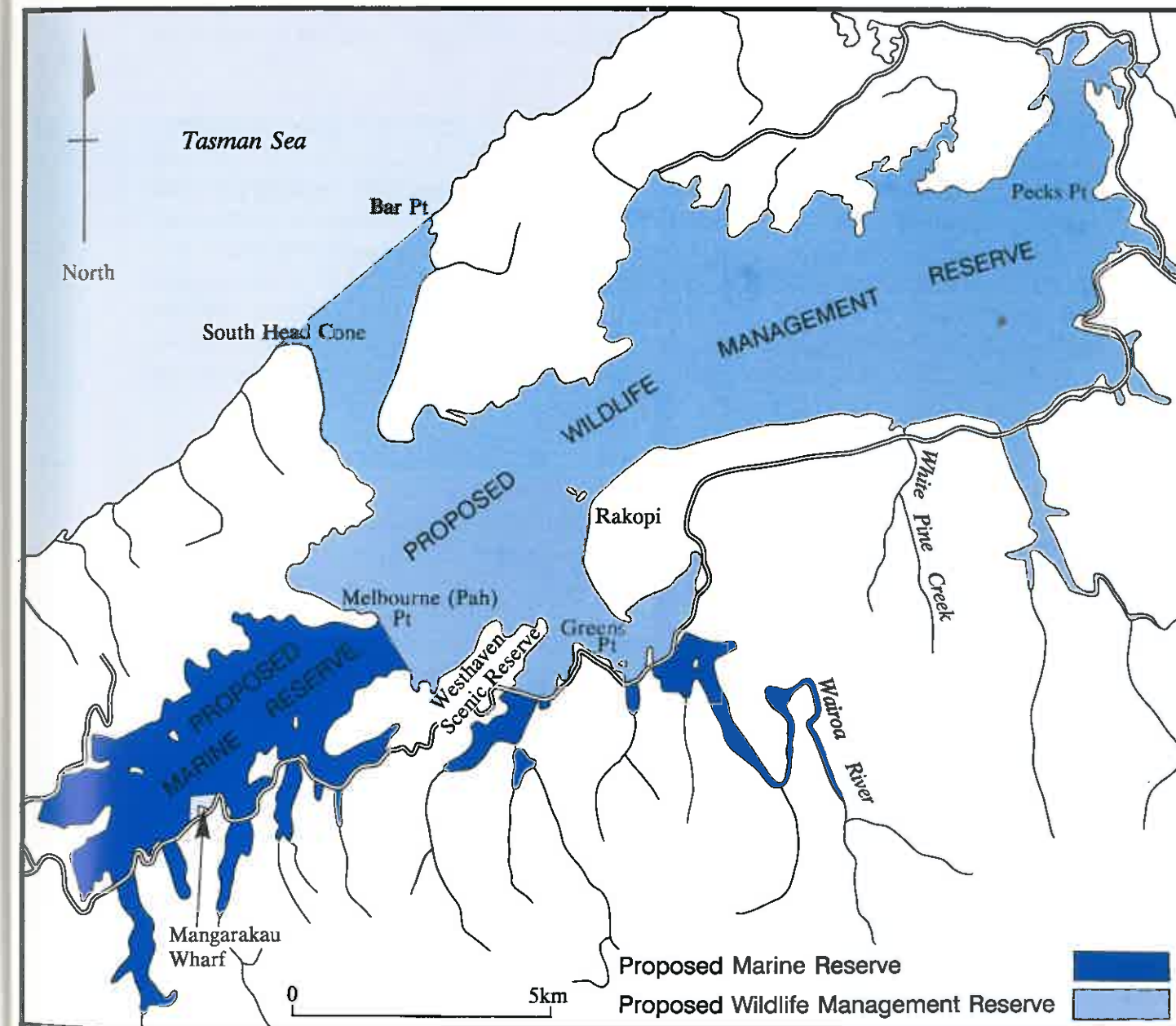
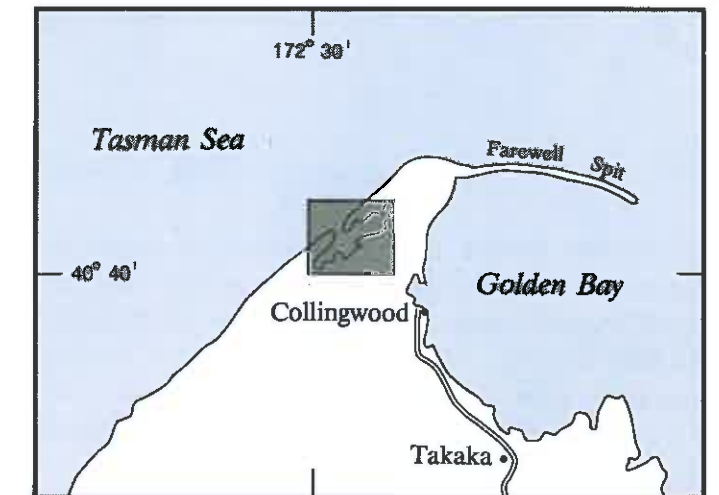
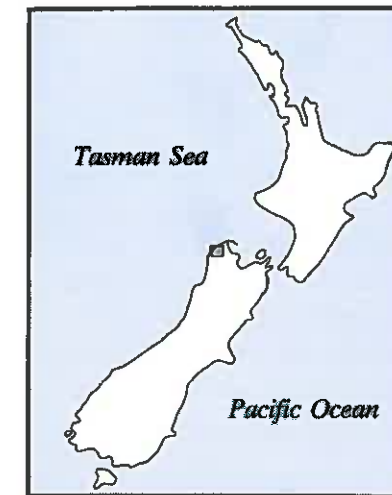


Fig.1 Location and boundary of proposed marine reserve and proposed wildlife management reserve.

4.5 MONITORING

Wise management depends on having sound information. If a marine reserve is established, DOC will continue to collect information on the distribution and abundance of key biological features. Periodic monitoring would determine what changes were occurring. The use of the reserve by people would also be monitored. DOC would be responsible for monitoring, but would encourage marine science, educational institutions and local residents to participate and assist.

4.6 INTERPRETATION

The values of the marine reserve would be publicised to enhance public awareness and enjoyment of the area, and public education will help ensure its appropriate use.

4.7 ADVISORY COMMITTEE

The Department of Conservation wants strong community involvement in the management of the inlet. An advisory committee could be formed with representatives from the tangata whenua, recreational fishers, landowners, conservation groups, Fish and Game Council, MAF Fisheries, and others with an active interest or involvement in the proposed protected areas. Such a committee's role would be to give local input into the management planning and advisory functions of the Nelson Conservation Board and facilitate communication between all interested and affected parties.

4.8 ADMINISTRATION AND MANAGEMENT PLANNING

The Department of Conservation administers the Marine Reserve Act 1971 and would be responsible for day to day management of a marine reserve in accordance with the provisions of that Act.

Management of Westhaven (Whanganui Inlet) will be guided by the Department's conservation management strategy for Nelson and Marlborough currently being prepared and will be made available for public comment before it is adopted.

5. IMPLICATIONS FOR CURRENT USES AND USERS, AND OTHER GROUPS

- 5.1 **TANGATA WHENUA** (summarised from a submission from the Wakatu Incorporation 30/10/89, compiled by Dr. J. Mitchell, Nelson). Since ratified by hui Te Runanganui o Te Tau Ihu o Te Waka a Naui in meetings of Te Onetahua Marae committee (Tarakohe, Golden Bay), Te Awhina Marae committee (Motueka) and the committees of the iwi trusts with manawhenua in the area.

Maori History:

The inlet is recognised as part of the Te Tai Tapu district. This area stretches from Onetahua (Farewell Spit) to Kawatiri (Buller River) and inland to the main ridges of the western slopes. Te Tai Tapu has always been important to the Maori, both in its own right, as a food basket for resident hapu and as a staging post on one of the major overland routes to and from greenstone and other taonga of the south.

A long history of different tribes going back some 800 years has been recorded for the area. Today manawhenua of Te Tai Tapu/West Whanganui rests primarily with the Pareteata and Turangapeke hapu of the Ngati Rarua iwi, especially the descendants of Riwai Turangapeke, his brothers and fellow chiefs and families, and descendants of Henare Tatana Te Keha of the Te Ataiwa iwi.

Occupation Reserves:

In 1845, Commissioner William Spain created a number of Occupation Reserves in the Westhaven (Whanganui Inlet) area. Spain acknowledged that these titles often carried rights of food gathering and harvesting of nearby forest, river, estuary and coastal resources. Two Occupation Reserve blocks remain in Maori ownership (North-Head and Rakopi areas).

Traditional Fishing:

Many descendants and parties from other areas visit the estuary and coast to harvest fish and kina. On special occasions such as tangi, a group from Motueka will visit Te Tai Tapu for kaimoana as it is one of the few places left where a good harvest can still be guaranteed. Areas recognised as being important for harvesting are the entrance to the inlet for kina (sea urchin) gathering, and the northern inlet for fin fish.

The Wakatu Incorporation supported protection of Whanganui Inlet under marine reserve legislation provided that:

- (i) *customary non-commercial uses of the inlet be protected;*
- (ii) *community groups be represented in an interim committee and a management committee;*

- (iii) *commercial fishing be excluded from the whole inlet and from a zone around the mouth;*
- (iv) *modification through earthworks of estuarine and/or adjacent forest be banned;*
- (v) *land practices be so controlled to ensure no sedimentation enter the inlet; and*
- (vi) *ensure other potential pollutants not be introduced to the area and careful district planning be followed to ensure that run-off into the inlet from rubbish dumps be free of contamination.*

Collection of kaimoana would not be possible in the marine reserve. See Chapter 7.5.1, page 16 for traditional fishing in the wildlife management reserve.

5.2 COMMERCIAL FISHERS

The New Zealand Federation of Commercial Fishermen and the New Zealand Fishing Industry Board have insisted there be full and proper consultation over marine reserves and that there be no regulations or management provisions which favoured one fishing sector over another; ie. any restrictions on commercial fishers must also be applied to recreational fishers.

According to a representative of the Federation of Commercial Fishermen on the advisory committee, no commercial fishing currently occurs in the inlet. Commercial fishers do use the Mangarakau wharf area and the adjacent channel to launch and moor their boats. To overcome any conflict within this area, it is proposed to exclude the Mangarakau Wharf area from the marine reserve. Boat passage by commercial fishers through the proposed marine reserve would not be affected by the marine reserve.

5.3 RECREATIONAL FISHERS

The proposed marine reserve would close 21% (567 hectares) of the Inlet's waters to any form of recreational or traditional harvesting. Much of this area is shallow water covered by the tide for only short periods. From submissions received and from discussions with the advisory committee, relatively little recreational fishing occurs in the southern inlet. The closure of the southern zone to fishing and traditional gathering does not, therefore, appear to be a major issue.

5.4 USE OF FIREARMS

Discharge of a firearm within a marine reserve is not permitted.

5.5 ADJACENT LANDOWNERS

A variety of views were expressed by local landowners, but the general consensus was for the estuary to remain in its present state. Most supported protection of the estuary if fishing and traditional uses were maintained.

Stock grazing on the foreshore and within the estuary would be incompatible with the proposed marine reserve. There are no farms directly adjacent to the proposed marine reserve.

An increasing number of land blocks are being subdivided for holiday homes or lifestyle blocks around the estuary margin. Few submissions were received from these landowners, but most were fully supportive of protection, provided that access to the estuary was maintained.

5.6 NON-EXTRACTIVE RECREATIONAL USERS

Westhaven (Whanganui Inlet) has a natural beauty which attracts many visitors. In addition to its forested and terrestrial features, it has a spectacular coastline and provides a unique experience for visitors to the area. The proposed marine reserve would not affect boating enthusiasts or others who visit the area simply to take photographs or observe its features.

5.7 SCIENTIFIC INTERESTS

Protection of Westhaven would provide opportunities for the scientific study of marine features in a natural and relatively undisturbed state. Because very few areas are left in New Zealand which are not subject to disturbance, the proposed marine reserve would enable comparative studies on the effect of human activity and disturbance in estuaries elsewhere.

The scope and potential for useful research would be considerable. Possible subjects include investigations of the biology and ecology of species and communities which inhabit the area; studies of features unique to this area; investigation of the status of estuaries with low levels of human-induced nutrient input; the influence of forested catchments on estuarine zones; and studies aimed at assessing the values of protected estuaries and catchments.

5.8 EDUCATIONAL INTERESTS

A Westhaven (Whanganui Inlet) marine reserve would provide opportunity to educate people at all levels and ages about the marine environment and its flora and fauna. First-hand experience would be complemented by the production of written and visual material on the area's features.

5.9 CONSERVATION INTERESTS

The proposed protection represents a positive nature conservation initiative. The reasons for seeking such protection are many and varied and include the protection of nature for its intrinsic values, and the provision of unexploited and undisturbed areas which can be enjoyed by people.

5.10 DIVING

Diving activities in the inlet are limited due to poor underwater visibility, unfavourable weather, strong tidal currents and poor access. No submissions were received from divers on the marine reserve proposal. The only area likely to affect divers is located within the inlet's mouth outside the proposed marine reserve.

6. JUSTIFICATION

6.1 MEETS PURPOSE OF THE MARINE RESERVES ACT (1971)

The ecological values of Westhaven (Whanganui Inlet) are summarized in Appendices 4 and 5. These values are fully discussed in "A report on the ecology of Whanganui Inlet, North-west Nelson" by Davidson (1990).

Section 3(1) of the Marine Reserves Act 1971 declares that marine reserves have the "*purpose of preserving, as marine reserves for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features, of marine life, of such distinctive quality, or so typical, or beautiful, or unique, that their continued preservation is in the national interest*".

This application for a marine reserve in the southern part of Westhaven (Whanganui Inlet) meets most of these criteria.

The proposed marine reserve contains *typical* examples of 16 of the 17 major estuarine habitat types recorded from the estuary. Boulder habitat not found in the proposed reserve is restricted to the entrance and outer coast areas of Westhaven (Whanganui Inlet).

The area has a high degree of naturalness. All catchments surrounding the proposed marine reserve are clad in native forest. In addition there is no urban or industrial development around its margins. This represents a rare opportunity for *scientific study* of an estuarine environment in a relatively natural state.

The inlet has low levels of artificial nutrient input, low pollutant input, natural freshwater input and intact salt marsh communities. Low freshwater input and a variety of hard and soft substrate habitats result in a high diversity of invertebrate and fish species in the inlet. The recognition and protection of all these features is in the *national interest*. To ensure their continued preservation, and to minimize the influences which directly or indirectly affect the abundance of organisms within the area, marine reserve legislation is appropriate. Such protection would allow the estuarine area to revert to as near a natural state as possible.

In summary, the proposed marine reserve in southern Westhaven meets the statutory purposes for which marine reserves are established. It incorporates both representative and unique features, has considerable potential for *scientific study* and is the *national interest*.

6.2 MEETS OTHER LEGISLATIVE CRITERIA

Section 4(1) of the Marine Reserves Act prohibits the establishment of a marine reserve in any area in which a lease or licence under the Marine Farming Act (1971) has been issued. No such lease or licence is currently held within the proposed marine reserve area.

6.3 WIDESPREAD SUPPORT

Submissions received on the marine reserve proposal, and discussions with the advisory committee, indicate a high level of support for protecting Westhaven provided that adequate provision is made for traditional and recreational fishing and hunting outside the marine reserve.

PART III

7. Wildlife Management Reserve

7. WILDLIFE MANAGEMENT RESERVE

7.1 LOCATION AND DESCRIPTION

The sea entrance to Westhaven (Whanganui Inlet) is located 19 kilometres south-west of Farewell Spit on the west coast of the South Island (Figure 1). The inlet is a barrier enclosed, drowned river valley approximately 13 kilometres long and between 2-3 kilometres wide (2,744 hectares). As the tide enters the inlet it is divided into north-east and south-west channels. Once filled these channels spill water out onto expansive intertidal flats which dominate the estuary (72% of total estuarine area).

7.2 BOUNDARIES

Figure 1 shows the boundaries for the proposed wildlife management reserve. This zone is bounded by a line beginning at Bar Point which then runs south-west to South Head Cone. From there the boundary runs south around the margin of the Inlet to Melbourne Point (Pah Point), then south-east to the closest unnamed point in the Westhaven Scenic Reserve. It then travels north-east around the margins of the Inlet to the point of commencement (Bar Point). A total of 2,177 hectares or 79% of the total inlet is included.

7.3 OBJECTIVES

The principal objectives of this proposal are:

- (i) to meet the purposes of the Wildlife Act (1953), notably those relating to the protection of wildlife and associated wildlife habitat in the national interest; and
- (ii) to contribute toward the Department of Conservation's mandate to conserve and protect natural resources of New Zealand.

7.4 PROPOSED MANAGEMENT

7.4.1 Level of Protection

The taking of MAF Fisheries administered species (including finfish, sea urchins (kina)), and netting of whitebait and hunting of acclimatized waterfowl would be allowed within the terms of the proclamation. The Department would like to see all other bottom-dwelling animals and attached plants protected under fisheries regulations. The Department considers the use of bulk fishing techniques such as set-netting as inappropriate in the enclosed waters of Westhaven. Supporting fishing regulations which protect food for wildlife and exclude indiscriminate bulk fishing will be sought from MAF Fisheries.

All other marine organisms would be protected from unauthorised activities as they represent either food for wildlife, or form part of the food chain in the estuary.

7.4.2 Access

The proposed conditions of access are as follows: (1) unrestricted boat and foot access throughout the marine reserve; (2) vehicle launching of boats only at Mangarakau wharf, Rakopi sandflats, the old tidal road (south-east of Peck's Point), and at Greens Point unless by adjacent land-owners; (3) no vehicles on tidal areas other than boat launching areas unless for traditional farming practices; (4) domestic animals or birds would be allowed only in the wildlife management reserve for farm, hunting or recreational pursuits, and under direct control (no dogs would be permitted on the tidal areas from Rakopi to White Pine Creek); and (5) the discharge of firearms would be allowed only in the wildlife management reserve for waterfowl hunting during the licensed season. These provisions would ensure the public had freedom of access and entry to the proposed protected areas subject to such conditions and restrictions necessary for the protection of wildlife and the habitat and food of wildlife.

7.4.3 Enforcement and Compliance

Policing of a wildlife management reserve would be the responsibility of the Department of Conservation, but policing of fishing would continue to be the responsibility of MAF Fisheries.

7.5 IMPLICATION FOR CURRENT USES AND USERS

7.5.1 Tangata Whenua

The Westhaven Inlet area is part of the Te Tai Tapu district and has a long history of occupation. It is important to tangata whenua as an area where kaimoana can be reliably gathered for special occasions such as tangi.

Traditional fishing would be allowed to continue in the wildlife management reserve. Tangata whenua have stated they will use bulk fishing techniques only when required to cater for special occasions (eg. major hui and tangi). This represents a voluntary restriction requiring the authority of a permit issued by appointed Kaitiaki. Catch limits would be according to existing MAF Fisheries regulations.

7.5.2 Commercial Fishers

Passage of commercial boats through a wildlife management reserve would continue. The use of fishing devices which damage marine habitats or communities could be excluded from use within the terms of the Fisheries Act.

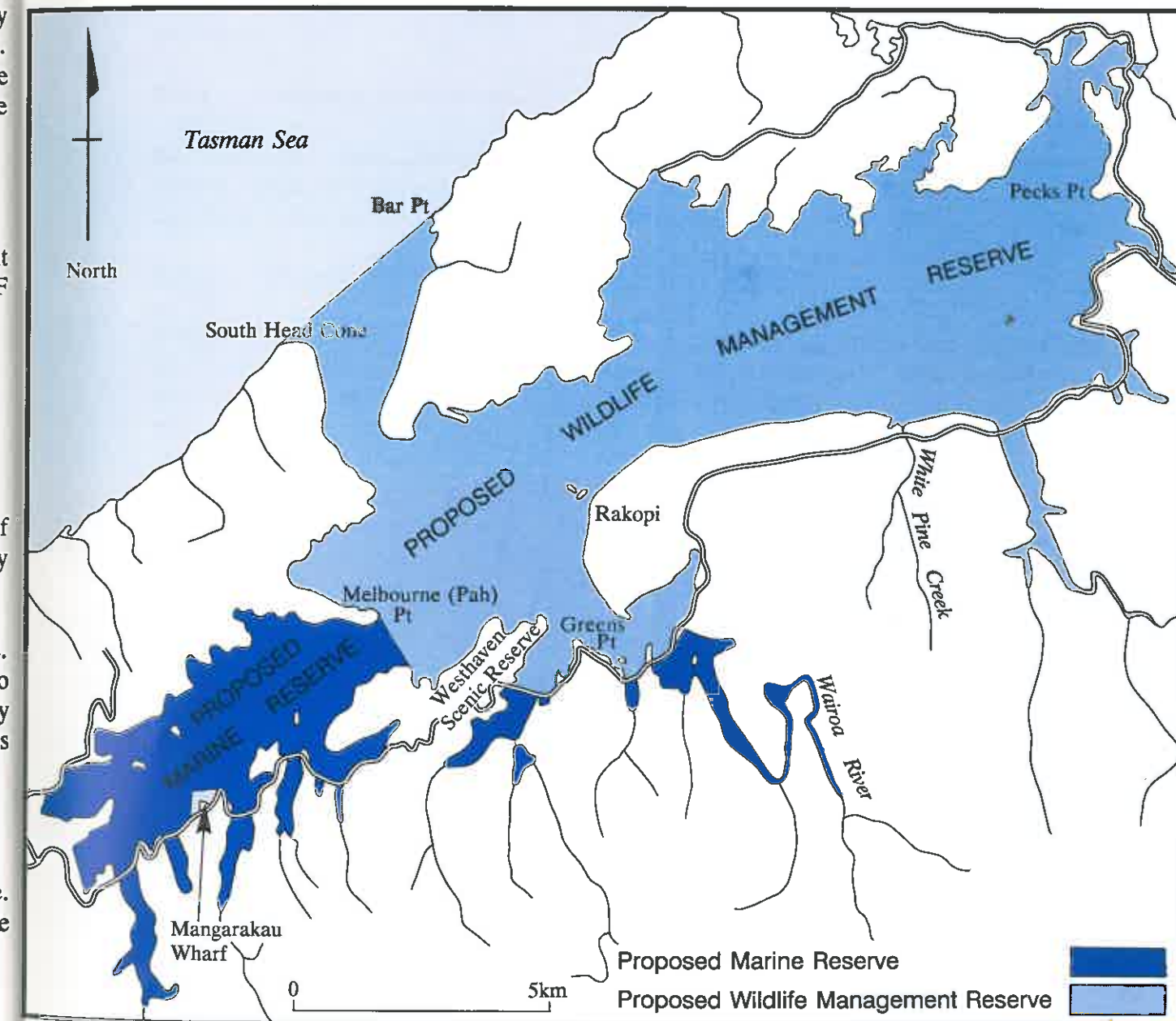
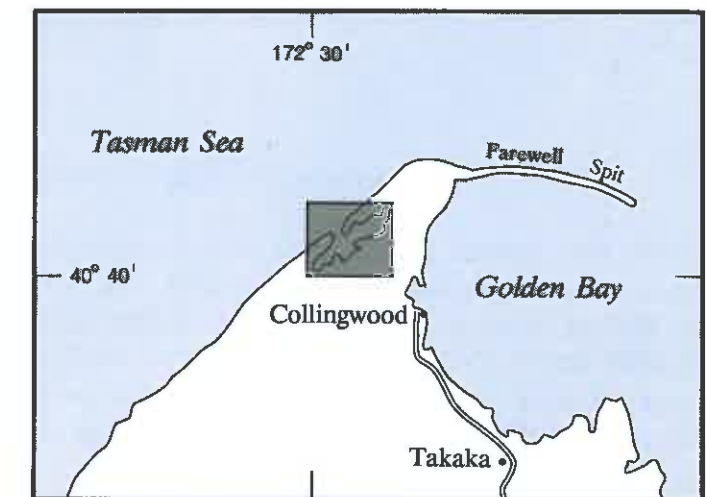
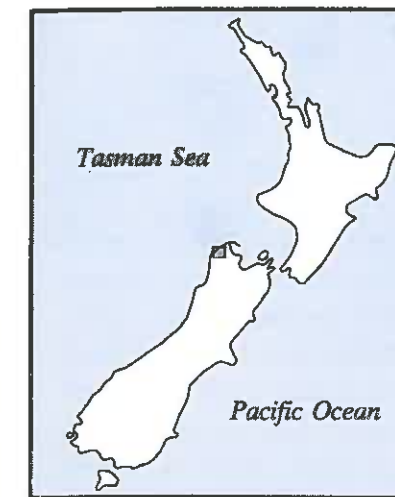


Fig.1 Location and boundary of proposed marine reserve and proposed wildlife management reserve.

7.5.3 Recreational Fishers

Recreational fishing would be allowed in a wildlife management reserve and would remain under the control of MAF Fisheries. Whitebaiting would also continue in this area. Other marine organisms constitute either food for wildlife, or form part of the food web and productivity flow through the estuary. Fishing methods which damage habitat or other plants and animals throughout the estuary would be highly undesirable. Therefore, all bottom towed devices in the proposed protected areas could be excluded from use under Fisheries regulations.

Bulk fishing methods such as set-lining and netting remains an issue with many recreational fishers in the proposed wildlife management reserve area. The continued use of these methods is a matter which MAF Fisheries can address through fisheries regulations.

7.5.4 Adjacent Landowners

At Westhaven, stock grazing would be incompatible within a wildlife management reserve. Traditional movement of stock around estuary margins, vehicle access and boat launching would be specified by conditions in the proclamation.

7.5.5 Waterfowl Hunters

Waterfowl hunting in the proposed wildlife management reserve would be largely unaffected. Existing hunting rules would apply, but no permanent maimai would be permitted in the inlet (portable maimai and camouflaged boats would be permitted). A restriction on the use of dogs in the Rakopi to White Pine Creek area is proposed (see 7.4.2).

7.6 JUSTIFICATION

Wildlife management reserves are proclaimed pursuant to Section 14A, of the Wildlife Act 1953. Section 14A(1) states the Governor-General may by proclamation declare any area "... available for the purpose...to be a wildlife management reserve for the purposes of this Act..."

A wildlife management reserve must adhere to the purposes of the Wildlife Act. Reserves are established to allow particular protection to be given to wildlife and associated habitat. The Wildlife Act does not protect all animals, only those defined as "wildlife". It does, however, allow other animals and plants to be protected where they provide habitat or food for wildlife.

Section 2(1) of the Act defines:

- (i) "*animal*" as being any mammal (excluding domestic animals, rabbits, hares, seals and marine mammals), birds (excluding domestic birds), and any reptile or any amphibian (and includes any terrestrial or freshwater invertebrate declared to be an animal under Section 7B of this Act).

- (ii) "bird" means any bird whether native, introduced, imported, or that has migrated to or arrived in New Zealand and become established there (but does not include any domestic bird).
- (iii) "wildlife" means any animal living in a wild state (but excludes wild animals subject to the Wild Animal Control Act 1977).

A detailed account of the inlet's ecological importance is contained in Davidson (1990), and summarized in Appendices 4 and 5 of this document. The report states Westhaven is one of only 20 sites in New Zealand that hold 1000 waders or more in summer. Further, the regionally uncommon reef heron was also recorded on the rocky shores near the mouth of Westhaven. The inlet is also relevant for its dotterel population as it supports a significant proportion of the regional total (Appendix 5). Westhaven ranks second in the Nelson region for the number of wader species recorded. The inlet is the only site on the west coast of the South Island where the vulnerable banded rail have been recorded. Butler states that wetland sites around the margins of Westhaven "... would make an important contribution to safeguarding marsh birds within the region." (Appendix 5). In that report Dr D. Butler, states "... that the large expanses of intertidal mudflat offer feeding areas for many wading birds and its unmodified sections and fringe vegetation support characteristic species that are increasingly rare." (pp. 62).

In relation to marsh birds including the banded rail and bittern (both vulnerable species) and the fernbird and reef heron (regionally vulnerable), all are at risk because of habitat destruction and/or disturbance. The report by Davidson further states that "... protection of the sites at Whanganui Inlet would be an important contribution to the safeguarding of birds." (pp. 77).

There is, therefore, considerable evidence to support the establishment of a wildlife management reserve over Westhaven (Whanganui Inlet) for the purpose of "... protecting wildlife (especially birds) which use the estuary." (see chapter 5 In: Davidson, 1990).

In the proclamation of a wildlife management reserve under Section 14A of the Wildlife Act, a number of conditions can be imposed which would have the effect of preserving wildlife habitat. Given the importance to the birds (especially the waders and marsh birds) of Westhaven's unmodified estuarine habitat, and the reliance of these birds on estuarine productivity, it is appropriate to protect that habitat. Protection should include all components contributing to the basic primary productivity of the estuary. Most important in this are the eelgrass beds, salt marsh, mudflats and benthic invertebrates on which the wildlife depend. Protecting these areas would be within the purposes of the Act.

Davidson (1990) documents the impact of activities such as dredging, infilling, pollution, refuse disposal, causeways, roading, livestock grazing and the introduction of exotic flora and fauna. The impact of such activities on wildlife indicates that their control would be within the purposes of the Wildlife Act.

7.6.1 Wildlife Act and the Sea

Section 14A(1) states the Governor-General may from time to time declare any "area" to be a wildlife management reserve. The Act also states that sea or harbour waters can be affected by a proclamation only on the joint recommendation of the Ministers of Conservation, Lands, Transport and the Minister administering the Department of State controlling the land.

The original Act in 1953 confined management reserves to "areas of land", however, the words "of land" were deleted and a new provision (Section 14) was included by amendment in 1959, indicating a clear intention to extend the concept of protection to encompass both land and sea.

Examples of estuarine/tidal areas already protected in the Wildlife Act include Taiaroa Head foreshore (wildlife sanctuary), Buller River Mouth (wildlife refuge), the previous Wildlife Act protection of Farewell Spit (now revoked in favour of a nature reserve), and Ohiwa Harbour Sandspit (wildlife refuge).

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Draughting of the figures, title page and associated pamphlet were by Garry Holz and Colin Ratcliffe.

APPENDIX 1

STATUTORY PROCESS FOR ESTABLISHING A MARINE RESERVE

The statutory process for establishing a marine reserve commences with an application for an Order in Council being lodged with the Director-General of Conservation. Following consultation with the Director-General the application is publicly notified. For a period of two months from the date of first publication of the notice any person or organisation who wishes to object to the application has the statutory right to do so. Objections must be in writing and specify the ground of the objection. They are sent to the Director-General of Conservation with a copy being served on the applicant (where the applicant is the Director-General only one copy need to be served). Any objections and any answer to those objections prepared by the applicant and served on the Director-General within three months from the date of first publication of the notice must then be forwarded to the Minister of Conservation for consideration before proceeding further with the application¹. Where the Director-General is the applicant there is provision for the Minister of Conservation to obtain a report on the objections from an independent source. If the Minister upholds any objection the area will not be declared a marine reserve. Section 5(9) "*If, after consideration of all objections, the Minister is of the opinion that no objection should be upheld and that to declare the area a marine reserve will be in the best interests of scientific study and will be for the benefit of the public, and it is expedient that the area should be declared a marine reserve, either unconditionally or subject to any conditions (including any condition as to providing the cost of marking the boundaries of the marine reserve under section 22 of this Act, and any condition permitting fishing within the reserve by persons not holding a permit issued under Part IV of the Fisheries Act 1983), the Minister shall, if the Ministers of Transport and Fisheries concur, recommend to the Governor-General the making of an Order in Council accordingly.*"

1

While there is no express statutory provision relating to submissions in support of an application for an Order in Council to declare an area a marine reserve any expressions of support that are received may be used by the applicant in answer prepared in terms of Section 5(4) of the Marine Reserves Act 1971.

APPENDIX 2

COPY OF FORMAL NOTICE OF INTENTION TO APPLY FOR A
MARINE RESERVE AT WESTHAVEN (WHANGANUI INLET)NOTICE UNDER SECTION 5
MARINE RESERVES ACT 1971


Pursuant to Section 5 of the Marine Reserves Act 1971 I hereby give notice of my intention to apply for an Order in Council declaring an area in the southern estuarine portion of Westhaven (Whanganui Inlet) a marine reserve, and to be known as the Westhaven (Whanganui Inlet) Marine Reserve.

A plan of the proposed marine reserve showing all tidal waters coloured blue and the boundaries and the extent of the area sought to be declared a marine reserve may be inspected free of charge at Nelson, Takaka and Motueka offices of the Department of Conservation, or on request from the address below. (The area proposed for a marine reserve abuts an area subject to a proposal for a wildlife management reserve being investigated by the Department of Conservation.)

Any person or organisation may object to the making of an Order in Council establishing the marine reserve by specifying the grounds of the objection in writing and submitting it to the Director-General, Department of Conservation, whose address for service is given below, within two months from the date of the first publication of this notice.

The date of the first publication of this notice is 26 June 1993.

This notice of intention to apply for a marine reserve is given by the applicant, the Director-General of Conservation, whose address for service is at the offices of the Regional Conservator, Department of Conservation, Monro Building, Bridge Street, Private Bag 5, Nelson.


Bill Mansfield
Director-General of Conservation

APPENDIX 3

STATUTORY PROCESS FOR ESTABLISHING A
WILDLIFE MANAGEMENT RESERVE

On the recommendation from the Minister of Transport the Minister of Conservation would recommend to the Governor-General the making of a proclamation declaring the area available for the purpose to be a wildlife management reserve for the purposes of the Wildlife Act (1953).

The Department has already undertaken an extensive public awareness campaign involving submissions on the subject of marine protection for Westhaven (Whanganui Inlet). This document calls for a round of submissions in response to the proposed wildlife management reserve in the northern inlet. The period for submissions is two months from the date of release of this document (see front cover). The Department will base its recommendations to the Minister on ecological grounds and submissions received.

APPENDIX 4

SUMMARY OF ECOLOGICAL FEATURES

The Department of Conservation has completed a detailed report on the ecology of Westhaven (Whanganui Inlet) (Davidson, 1990).

The ecological investigation included the inlet, entrance and adjacent outer coast and was carried out between October 1988 and October 1989 by Department of Conservation staff. The following text summarises the report's main points.

Westhaven (Whanganui Inlet) is the second largest barrier-enclosed estuary in the South Island (2744 hectares) behind Waimea Inlet, Nelson (3455 hectares).

The coast of the inlet has been selectively logged, flax milled and mined for coal and gold, but most of the inlet has escaped permanent ecological damage from industrialisation, reclamation and land development. Most catchments are covered with regenerating forest.

Seventeen main habitat types were identified in the estuary, entrance and adjacent outer-coast. A characteristic invertebrate community was recognised for each habitat. The distribution and location of each habitat and vegetation type are displayed on ten marine habitat maps in the full report. Along with three maps detailing terrestrial vegetation types.

The most common estuarine habitat was eelgrass (859 hectares), followed by fine sand (384 hectares) and mobile sand (269 hectares). Most eelgrass was located in the northern half of the Inlet (92%).

Invertebrates were collected from 250 replicate core samples from 50 sites in Westhaven (Whanganui Inlet). One hundred and sixty-three invertebrate species were recorded from intertidal and subtidal sites in the entrance and estuary. This is the highest known number of species recorded for any South Island estuary. The highest density of benthic invertebrates was 4830 individuals per square metre. Mollusca were represented by 72 species, Crustacea by 45 species, Polychaeta by 26 species, Echinodermata by five, Anthozoa by four, Porifera by numerous species, Insecta by three species, Nemertina by one, Turbellaria by one, Hydroid by one, and Sipunculida by two species. Three new species of Amphipoda were recorded from Westhaven (Whanganui Inlet) (Hurley, 1989).

Thirty-eight marine and 12 freshwater fish species were recorded from Westhaven (Whanganui Inlet) and freshwater catchments (Eldon and Ward, 1991).

Forty-two species of waterbird were recorded from the inlet. The most common bird species were South Island pied oystercatcher, bar-tailed godwit, knot and banded dotterel. The inlet represents the second most important tidal area in the Nelson/Marlborough region behind Farewell Spit for numbers of wader bird species. Westhaven (Whanganui Inlet) is the only location on the West Coast of the South Island where the nationally important banded rail is present (D. Butler In: Davidson, 1990).

Based on conservation criteria developed for the evaluation of estuaries, Westhaven (Whanganui Inlet) was compared with three other South Island estuaries: Waimea Inlet, Avon-Heathcote and Parapara Inlet. Westhaven (Whanganui Inlet) was ranked highest of these estuarine areas.

Productivity estimates were the highest per unit area for any estuary in the South Island to date.

APPENDIX 5

COMPARISON OF ECOLOGICAL VALUES WITH OTHER ESTUARIES

BIRDS

Waders:

The estuaries of the Nelson region rank alongside those of the Auckland region in their importance to wading birds. This is particularly so in summer when the November counts of OSNZ show Nelson sites holding 20.5-30.8% of the national total of waders; c.f. winter (June) 14.5-18.1% (years 1983-6, 'OSNZ NEWS'). Farewell Spit alone holds 15-25% of the summer total and shares with Manukau Harbour the position as the most important site in terms of numbers each year. Westhaven (Whanganui Inlet) is one of about twenty sites in New Zealand that hold 1,000 waders or more in summer, ranking c.17th in its totals in 1985 and 1986 (OSNZ).

A large proportion of the summer wader population in the Nelson region is made up of two Northern Hemisphere species, the eastern bar-tailed godwit and the knot (Table 3) (counts of OSNZ).

Summer numbers of godwit at Westhaven (Whanganui Inlet), 1,000-2,000 birds (November 1984 count assumed to have missed most birds as will occur on some tides), represent 5-10% of those in the Nelson region. Westhaven (Whanganui Inlet) holds a smaller percentage of the regional total of knot, but typically ranks second behind Farewell Spit.

In winter the Nelson region is particularly important for two species, South Island pied oystercatcher, though it holds fewer than the Auckland harbours, and banded dotterel for which Farewell Spit and Lake Ellesmere are the major sites. Westhaven (Whanganui Inlet) holds few South Island pied oystercatchers (Table 3), but its dotterel population is of more relevance representing a significant proportion of the regional total.

Table 3 compares the four major estuaries of the Nelson region with the three major estuaries in the Auckland region. In terms of wader density (waders/intertidal hectare), Westhaven (Whanganui Inlet) does not appear to rank highly, but it stands out along with Farewell Spit for the markedly different densities in summer and winter. This pattern is largely explained by the relatively low numbers of South Island pied oystercatchers overwintering at these two sites.

The similarity of seasonal patterns at Westhaven (Whanganui Inlet) and Farewell Spit raises the question of whether the two sites are linked, birds moving the 11 kilometres from one to the other. OSNZ observers have suspected such movements, but they are difficult to confirm. During the very high tides of the January survey, most godwit and knot flew out the mouth of Westhaven (Whanganui Inlet), to roost it was assumed, on the ocean beach. However, these birds could have moved up the coast to the Spit. In a previous summer, a pre-roost gathering of 900 godwit was observed at the very northern end of the inlet, an area where no roost site would be available at the top of the tide (J. M. Hawkins, pers. comm.). These birds too could have been on their way to the Spit.

Westhaven (Whanganui Inlet) ranks second in the Nelson region for the number of wader species recorded, yet it is visited very rarely by birdwatchers compared to the other sites of Table 3. Examination of the species recorded at the inlet shows that they represent most wader 'types', for example:

1. *Tringa* sandpipers - common sandpiper, wandering tattler.
2. *Calidris* sandpipers - knot, sharp-tailed sandpiper.
3. *Numenius* spp. - far-eastern curlew.
4. Plovers and dotterels - golden plover, banded dotterel.

More frequent surveys of Westhaven (Whanganui Inlet) would be expected to record occasional visits by the other species in these wader groupings that regularly visit the region (eg. whimbrel, red-necked stint, New Zealand dotterel).

Marsh Birds:

This group includes the species that occupy the zone of estuarine fringe, from *Juncus/Leptocarpus/Schoenoplectus* through raupo and flax to manuka and shrub species.

The most significant species to occupy this habitat at Westhaven (Whanganui Inlet) is the banded rail, recorded at two sites at each end of the inlet. Unlike the other species in this group, it is now only found in marshes with a marine influence (salt marshes) in the South Island, not in freshwater sites. Westhaven (Whanganui Inlet) represents the only site for the species on the West Coast of the South Island, while a few are present on Stewart Island (Bull et al. 1985). The location of banded rail in the same marsh at the western end of the inlet in 1982 and 1989, and not in neighbouring marshes, suggests stability of the population.

Bitterns require densely vegetated wetlands, particularly those with standing water (Williams, 1985). One was flushed from a site west of Rakopi that offered this combination with water in channels and ponds at all tidal levels. Tapes of booming calls were played at this and other sites with no response, though it was rather later in the season than ideal for such a survey. Bittern are known from two nearby freshwater sites, Rakopi wetland and Mangarakau Swamp.

Crakes are notoriously difficult to census. This brief survey indicated that marsh crake were resident in two or three sites, areas with a fairly broad fringe including scattered raupo. Extrapolating from these sites, it is considered that there are six other sites suitable for crakes, two of which have never been surveyed and four that have been covered, but no birds found. The presence of single birds at Muddy Creek and east of Rakopi is assumed to indicate the presence of breeding pairs there. Extending this assumption to the other sites, the best estimate of the marsh crake population of the inlet is between two and nine pairs. Another assumption which is borne out by this brief survey and the very much more extensive one of Elliot (1983), is that banded rail and marsh crake will not occupy the same salt marsh.

The survey was too brief to state categorically that there is no resident population of spotless crane at Westhaven (Whanganui Inlet), but this seems likely, particularly after the findings of Elliot (1983) referred to earlier. The species was recorded at relatively few sites in New Zealand during the 1969-76 bird mapping scheme of OSNZ (Bull et al. 1985) and at one round the coast from the Takaka area to Hokitika. Westhaven (Whanganui Inlet) is thus a new location for the species, but recent work is showing marsh crane to be more common than once thought (e.g., birds located near Westport in 1985).

Fernbirds were located at six sites during the survey. This is considered to be a very incomplete picture of their distribution, for birds do not respond very readily to tapes at the time of year the survey was made. Suitable habitat exists round most of the larger salt marshes at Westhaven (Whanganui Inlet).

Both the banded rail and bittern are considered as "vulnerable" species and the fernbird as "regionally vulnerable" (Bell, 1986). This largely results from habitat destruction through wetland drainage, infilling and burning. The numbers of these species occurring at Westhaven (Whanganui Inlet) are not large, but they are significant because of this destruction which continues in many areas. The only major coastal wetlands with formal protection in the region are those at Farewell Spit and in Abel Tasman National Park. Protection of the sites at Westhaven (Whanganui Inlet) would be an important contribution to the safeguarding of marsh birds within the region.

Herons, Egrets and Spoonbills:

Westhaven (Whanganui Inlet) supports large numbers of the widespread white-faced heron, but apparently is only visited by occasional individuals of the other rarer species within this group. Both white herons and royal spoonbills have small populations in New Zealand, 100-120 and 50-100 birds respectively, and have been recorded once or twice at Westhaven (Whanganui Inlet). Cattle egret visit New Zealand in winter in much larger numbers and have only been recorded once at Westhaven (Whanganui Inlet). However, the inlet's location may make it one of the arrival points for Nelson region's cattle egret - the first records each winter usually come from nearby Pakawau (J.M. Hawkins, pers. comm.).

Seabirds:

Westhaven (Whanganui Inlet) did not support large numbers of seabirds during the survey, though more gulls may occur in winter. Gannets, caspian and white-fronted terns and red-billed gulls that breed on Farewell Spit may regularly feed there and the inlet may provide shelter for other seabirds during storms on the West Coast. Little shags and black-backed gulls would be the most numerous of the resident species, but Westhaven (Whanganui Inlet) does not hold significant numbers of either.

INVERTEBRATES

The number of invertebrate species recorded from Westhaven (Whanganui Inlet) are compared with other New Zealand estuaries in Table 4. Westhaven (Whanganui Inlet) is represented by the highest number of species, followed by the Avon-Heathcote Estuary (Christchurch) and Waimea Estuary (Nelson). Lowest values were recorded from the Wairau River Estuary (Blenheim) and Ahuriri Estuary (Napier).

Densities of common benthic invertebrates from various New Zealand estuaries are compared in Table 5. In Westhaven (Whanganui Inlet), maximum densities of most species are in the mid-range, however, some species are in relatively low densities (pipi, *Paphies australis*; capitellid polychaetes; stalk-eyed crab, *Macrophthalmus hirtipes*; mud crab, *Helice crassa*; hairy-handed crab, *Hemigrapsus crenulatus*). Densities of the nut shell, *Nucula hartvigiana* (1,958 per m²) recorded from eelgrass beds in Westhaven (Whanganui Inlet) is the highest recorded for any New Zealand estuary to date.

Whanganui and Waimea Inlets have the highest recorded number of species of invertebrate at the highest densities for an estuary in the Nelson/Marlborough region. Davidson and Moffat (1989) suggested estuary size, sampling intensity and habitat diversity contributed to the large number and densities of invertebrates in Waimea Inlet. Westhaven (Whanganui Inlet) can be characterised by having even more habitat types than Waimea Inlet, and this combined with unusually high salinity values, helps account for the high diversity of invertebrates. High salinities recorded over most of the inlet at both high and low tide allows many coastal species to enter. This phenomenon is particularly apparent in the entrance area where subtidal and intertidal rock and sand habitats, combined with high salinity, dominate the environment. It is expected that numerous species have yet to be recorded from this area.

All of the major feeding types are represented in Westhaven (Whanganui Inlet). As expected for estuaries, detritivores (deposit feeders) dominated the invertebrate fauna with 47 species. Detritivore numbers were closely followed by carnivores (41 species), herbivores (40 species), suspension feeders (21 species) and others (10 species), mostly parasites and scavengers. The number of herbivores recorded in Westhaven (Whanganui Inlet) is relatively high, probably due to the presence of eelgrass and rock substrata, both of which are covered in a layer of algae. The dominance by detritivores in Westhaven (Whanganui Inlet) and probably most estuaries in New Zealand, emphasises the importance of the detrital food chain.

Most detrital material in an estuary is derived from river input and fringe vegetation (Knox and Kilner, 1973; Gillespie and MacKenzie, 1981; Knox, 1986).

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Fish species recorded from Westhaven (Whanganui Inlet) are compared with selected New Zealand estuaries in Table 6. The highest number of marine species of fish recorded from an estuary are recorded from Westhaven (Whanganui Inlet) (37 species), closely followed by Porirua and Pauatahanui Inlets (36 species) and Waimea Inlet (31 species).

The number of freshwater fish species living in the catchments of the inlet is relatively high (Table 6). Eldon and Ward (1990) suggested that the high density of some fish, particularly the banded kokopu, was due to the relative proximity of adult habitated waters to the sea. This, combined with the clean waters, the unmodified nature of the area, lack of barriers and absence of trout, make the inlet and associated catchments an important area for native freshwater fish.

The variety of fish entering, living and/or feeding in Westhaven (Whanganui Inlet) suggests that the inlet is an important fishery area. The inlet is the only significant sheltered body of water along the North-west Nelson coastline. This factor is also reflected in the importance recreational fishers place on the inlet.

TABLE 3 Comparison of New Zealand estuaries in terms of numbers of the four most common wader species, average wader densities, and the number of different wader species recorded.

Site	Intertidal Area (ha)	SIPO	Maximum No. Of:			Mean No. Waders/Intertidal Hectare		No. Wader Species Recorded	Month Counted
			Bar-t Godwit	Knot	Banded Dotterel	Summer	Winter		
Nelson Region									
Whanganui Inlet	2,350	442	1,702	371	204	0.60	0.19	15	Nov 1984-8 June 1984-8
Farewell Spit	9,430	8,046	16,080	24,227	1,442	3.50	1.08	30	Nov 1984-8 June 1984-8
Waimea Inlet	2,867	3,065	2,930	750	84	0.98	0.82	14	Nov 1984-8 June 1984-8
Motueka Estuary	1,783	2,791	2,500	100	53	1.51	1.31	8	Nov 1984-8 June 1984-8
Other South Island									
Wairau Estuary	1,200	200	400	25	27+	(Not recorded)	(Not recorded)	21	(Over several years)
Avon/Heathcote	c.800	4,000	3,000	2	150+	(Not recorded)	(Not recorded)	14	(Over several years)
Auckland Region									
Manukau Harbour	c.18,000*			(Not analysed)		1.80	1.85	42	Nov 1983-6 June 1984-7
Firth of Thames	c.7,700*			(Not analysed)		1.59	2.18		Nov 1983-6 June 1984-7
Kaipara Harbour	c.28,400*			(Not analysed)		0.56	0.57	18	Nov 1983-6 June 1984-7

* The northern harbours hold extensive areas of mangroves (*Avicennia resinifera*) which are rarely utilised by waders. The area of Manukau Harbour was obtained from Veitch (1978) and includes an unknown, but relatively small, area of mangroves. The intertidal area of the Firth of Thames is 8,500 hectares, 800 hectares of which is mangrove (ibid), and that of the Kaipara is c.40,900 hectares including 12,500 hectares of mangroves (Veitch, 1979).

Sources:

- Whanganui Inlet - OSNZ counts and classified summarised notes.
- Farewell Spit - OSNZ counts and Lands & Survey (1983)
- Waimea Inlet - OSNZ counts and Butler (1989)*
- Motueka Estuary - OSNZ counts
- Wairau Estuary - Knox (1983b) - (includes Vernon Lagoons)
- Avon/Heathcote Estuary - Baker (1973), Holdaway (1983)
- Manukau and Firth of Thames - Veitch (1979)
- Kaipara Harbour - Veitch (1978)

TABLE 4

Number of macroinvertebrate species recorded from Whanganui Inlet and other estuaries in New Zealand.

	Crustacea	Mollusca	Polychaeta	Others	Total
Whanganui Inlet (North-west Nelson) ¹	45	71	26	20	159
Waimea Inlet (Nelson) ²	27	36	36	12	111
Nelson Haven (Nelson) ³	5	11	17	3	36
Parapara Inlet (Nelson) ⁴	4	21	24	5	54
Moutere Inlet (Motueka) ⁵	11	27	16	5	59
Wairau River Estuary (Blenheim) ⁶	10	3	7	0	20
Brooklands Lagoon (Canterbury) ⁷	13	8	10	9	40
Avon-Heathcote Estuary (Canterbury) ⁸	30	49	27	29	134
Okarito Lagoon (Westland) ⁹	15	7	3	17	42
Ahuriri Estuary (Napier) ¹⁰	6	11	14	2	33
Upper Waitemata Harbour (Auckland) ¹¹	21	31	25	10	87

1. Davidson, 1990
2. Davidson and Moffat, 1989
3. Knox, 1979a
4. Knox et. al., 1977a
5. Moffat, 1989
6. Knox, 1983b
7. Knox and Bolton, 1978
8. Knox and Kilner, 1973
9. Knox et. al., 1976
10. Knox, 1979b
11. Knox, 1983a

TABLE 5

Maximum densities (per m²) of selected species from Whanganui Inlet and other New Zealand estuaries.

	Whanganui Inlet	Waimea Inlet	Moutere Inlet	Parapara Inlet	Wairau River Estuary	Avon-Heathcote Estuary	Ahuriri Estuary
Bivalves							
<i>Chione stutchburyi</i>	2,524	3,168	1,347	1,426	1,340	3,050	7,270
<i>Paphies australis</i>	815	3,530+	4,494	-	452	2,547*	Present
<i>Tellina liliana</i>	283	815	419	230	-	1,337*	730
<i>Nucula harrigiana</i>	1,958	1,268	226	Present	-	-	N/A
Gastropods							
<i>Amphibola crenata</i>	215	532	68	230	129	977*	580
<i>Diloma subrostrata</i>	127	170	79	63	-	1,146*	360
<i>Potamopyrgus estuarinus</i>	3,656	23,450	Present	Present	10,449	884,000	2,500
<i>Zeacumantus luteiventris</i>	260	147	226	150	-	-	740
<i>Zeacumantus subcarinatus</i>	962	-	11	-	-	18,000*	N/A
Polychaetes							
Capitellidae	45	4,674	691	50	12,040	36,584*	Present
Nereidae	555	509	464	230	602	1,350*	Present
Decapods							
<i>Helice crassa</i>	71	328	430	180	516	250*	420
<i>Hemigrapsus crenulatus</i>	57	566	260	Present	-	255*	Present
<i>Macrophthalmus hirtipes</i>	23	102	215	-	516	250*	Present

* Jones, 1983

+ Subtidal

TABLE 6

Number of fish species recorded living, visiting or migrating into Whanganui Inlet and other estuaries in New Zealand.

Estuary	Marine Species	Freshwater Species	Commercial Species	Total Species
Whanganui Inlet ¹	38	12	17	50
Waimea Inlet ²	31	10	20	41
Ahuriri Estuary ³	21	8	18	29
Avon-Heathcote ⁴	24	10	19	34
Porirua, Pauatahanui ⁵	36	7	14	43
*Wairau River Estuary ⁶	13	9	7	22
Upper Waitemata Harbour ⁷	20	1	10	21

* Includes Vernon Lagoons

1. Davidson, 1990
2. Davidson and Moffat, 1990
3. Kilner and Akroyd, 1978
4. Knox and Kilner, 1973

5. Jones and Hadfield, 1985
6. Knox, 1984
7. Biggs, 1980

NELSON/MARLBOROUGH CONSERVANCY OCCASIONAL PUBLICATIONS

No. 1

Davidson, R. J., Moffat, C. R. 1990: A report on the ecology of Waimea Inlet, Nelson. 165 pp. NZ\$30.00.

No. 2

Davidson, R. J., 1990: A report on the ecology of Whanganui Inlet, North-west Nelson. 133 pp. NZ\$32.00.

No. 3

Byrom, A. E., Davidson, R. J. 1992: Investigation of behavioral patterns of black swan at Farewell Spit and Whanganui Inlet, North-west Nelson. 20 pp. NZ\$10.00.

No. 4

Davidson, R. J. 1992: A report on the intertidal and shallow subtidal ecology of the Abel Tasman National Park, Nelson. 161 pp. NZ\$30.00.

No. 5

Davidson, R. J., Duffy, C. A. J. 1992: Preliminary intertidal and subtidal investigation of Croisilles Harbour, Nelson. 36 pp. NZ\$12.00.

No. 6

Department of Conservation, 1992: Abel Tasman National Park marine reserve discussion paper. Ed: C. Taylor & A. S. Baxter. 43 pp. Free.

No. 8

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No. 10

Brown, D. A. 1992: Maud Island pest and weed operations plan 1991-1996. 40 pp. NZ \$5.00.

No. 11

Taylor, C. M. 1993: Abel Tasman National Park Marine Reserve, Summary of Submissions, December 1992. 76 pp. NZ \$10.00

No. 12

Department of Conservation, 1992: Westhaven (Whanganui Inlet), North-west Nelson: application for a marine reserve and proposal for a wildlife management reserve. Ed: R. J. Davidson & P. F. Lawless. 34 pp. Free.

No. 13

Department of Conservation, 1993: Tonga Marine Reserve, Abel Tasman National Park: Application, May 1993. Ed: A.S. Baxter. 33 pp. Free

In Preparation

* Duffy, C. A. J.; Davidson, R. J.; deC Cook, S.: Shallow subtidal habitats of the Marlborough Sounds, New Zealand.

* Chadderton, W. L.; Davidson, R. J.; Brown, D. A.: Quantitative investigation of selected subtidal sites in Pelorus Sound, Marlborough Sounds.