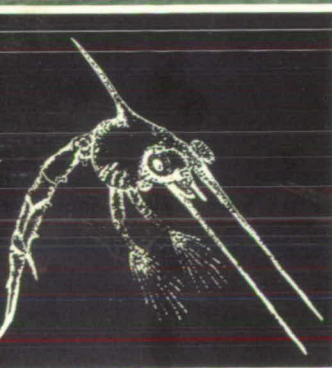
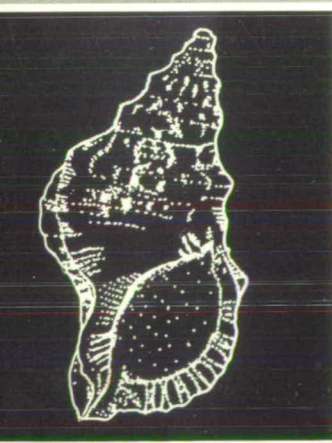
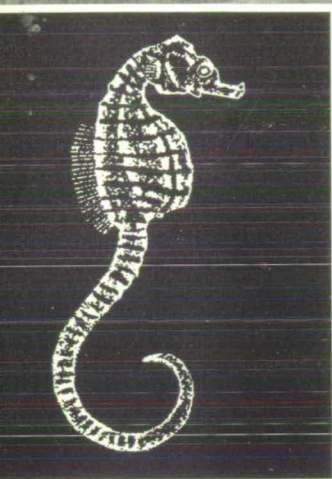




INTERNATIONALLY AND NATIONALLY
IMPORTANT COASTAL AREAS FROM
WAIMEA INLET TO CAPE SOUCIS,
NELSON, NEW ZEALAND



RECOMMENDATIONS FOR PROTECTION

Nelson/Marlborough Conservancy
Occasional Publication No15



CONSERVATION
TE PAPA ATAWHAI

**INTERNATIONALLY AND NATIONALLY IMPORTANT
COASTAL AREAS FROM WAIMEA INLET TO CAPE SOUCIS,
NELSON, NEW ZEALAND: RECOMMENDATIONS FOR
PROTECTION**

1994

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Te Papa Atawhai

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Photography: Rob Davidson (Whangamoia Estuary and adjacent coast)

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ABSTRACT

Marine areas from Waimea Inlet to Cape Soucis, Nelson were ranked on ecological and geomorphic criteria as internationally or nationally important. A total of eight sites (two international, six national) were recognised (Table 1). Internationally important sites were the Nelson Boulder Bank, recognised as an internationally important landform (Kenny and Hayward, 1993) and the Back Beach as the only known site where the endemic carabid beetle (*Cilenum tillyardi*) (I. Townsend, pers. comm.) has been recorded. A variety of criteria were fulfilled for the nationally important areas. These included the presence of threatened or rare species (Given, 1981; Bell, 1986), forested coastal catchments, spectacular seascapes, and low levels of human modification (high degree of naturalness) (Draft New Zealand Coastal Policy, 1992).

The report utilizes known information from the literature as well as data collected by Department of Conservation staff.

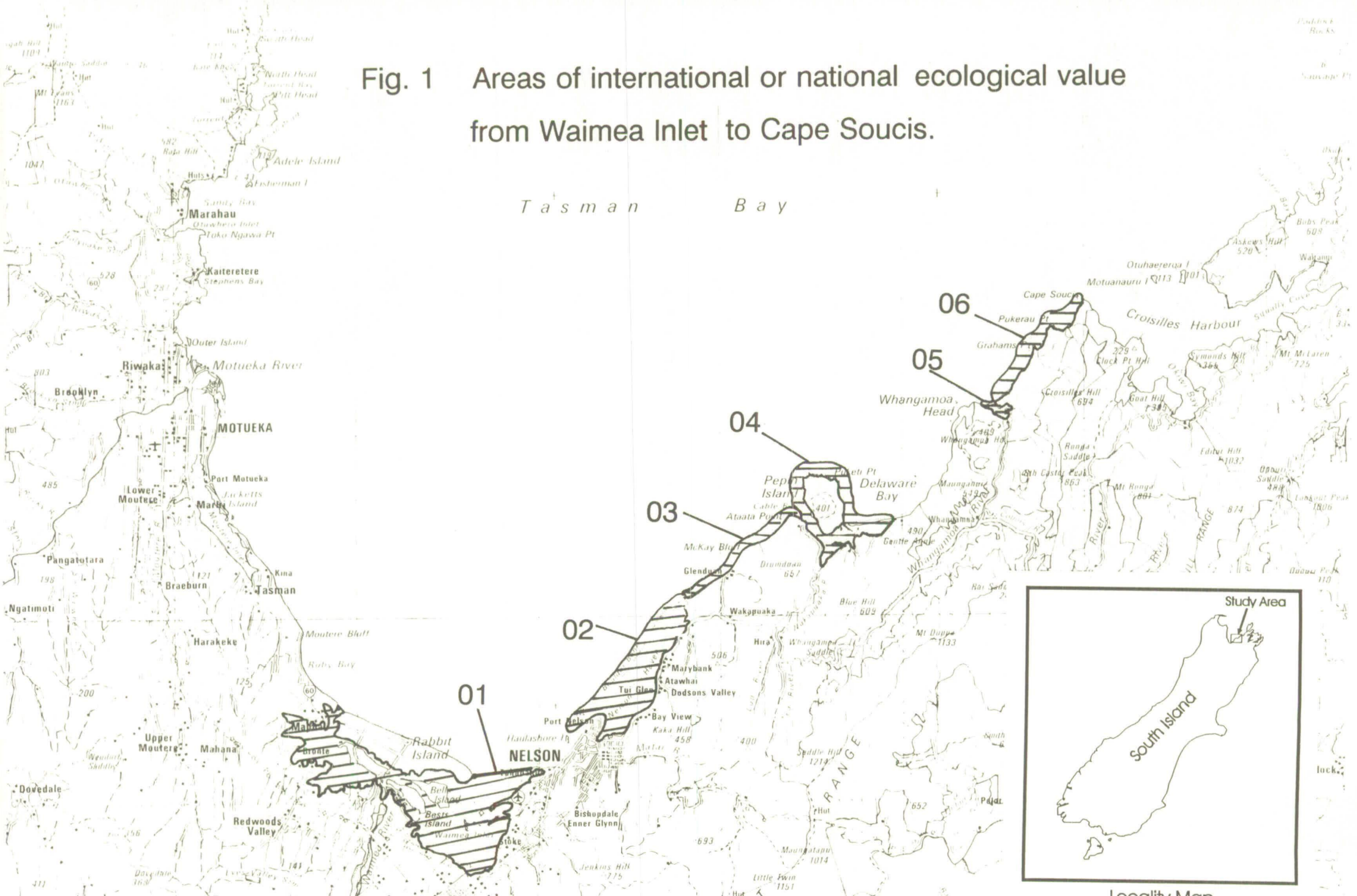
It is recognised that not all potential areas with high ecological value have been discovered. As more information is obtained, ranking of sites may be modified or new sites added. This report is therefore an introduction of ecologically important areas from Waimea Inlet to Cape Soucis. It also highlights the need for further biological study.

TABLE 1:

Index of internationally and nationally important sites from Waimea Inlet to Cape Soucis

Site	Status	Site number	Page
Waimea Inlet	National	01	14
Back Beach (Waimea Inlet)	International	01	14
Nelson Boulder Bank	International	02	22
Nelson Haven	National	02	22
The Glen to Cable Bay	National	03	28
Delaware Inlet and Spit, Pepin Island	National	04	31
Whangamoia Estuary	National	05	36
Whangamoia River Mouth to Cape Soucis	National	06	39

Fig. 1 Areas of international or national ecological value from Waimea Inlet to Cape Soucis.



INTRODUCTION

The information in this document has been compiled to assist with the preparation of the Nelson City Coastal Plan and other related policy statements and plans by the Nelson City Council.

The Resource Management Act 1991 (RM Act) requires the City Council to prepare a Regional Coastal Plan (RCP) for the coastal marine area of its region and a District Plan for the land area of its region. The RCP is to be prepared in consultation with the Minister of Conservation and iwi authorities of the region (RM Act, First Schedule).

The Minister of Conservation, under Section 68(4) of the RM Act, can require the Council to specify (by rules) in their coastal plan, an activity as a restricted coastal activity on the grounds that:

- (a) it has or it is likely to have significant or irreversible adverse effects on a coastal marine area; or
- (b) it occurs or is likely to occur in an area having significant conservation value.

A Restricted Coastal Activity (RCA) is an activity which occurs in the coastal marine area and is of a magnitude that the effects could be significant. In part, the purpose of this document is to consider (b) above; to introduce the coastal areas which have significant conservation value and to justify the importance of sound resource management for those areas. Whether this should be by means of RCA's, or other planning or management mechanisms, has not been determined at this stage. This report does not attempt to specify RCA's for the areas identified as have significant conservation value. However, any RCA's which are specified for a particular area will relate directly to the values of that area as identified in this document.

The draft New Zealand Coastal Policy Statement, released in September 1992, identified:

- (a) the RCA criteria to be identified in Regional Coastal Plans and applied throughout the coastal marine area (draft NZCP, Schedule 1); and
- (b) the criteria for identifying areas of significant conservation value which the Minister of Conservation is to specify in each region, and the proposed RCP will identify these areas (draft NZCP, Schedule 2, see Appendix 1).

Using the criteria in the draft New Zealand Coastal Policy Statement coastal areas of significant conservation value between mean high water springs and the 12 mile territorial sea limit in the Nelson City were evaluated. Although the criteria allow a wide degree of latitude, only areas with national or international status were considered as having appropriate status for inclusion in this report. Identification of coastal areas of significant conservation value in Nelson City was based on "*criteria for identification of areas of significant conservation value*" outlined in Schedule 2 of the draft New Zealand Coastal Policy Statement (Department of Conservation, 1992, see Appendix 1).

The present report evaluates the ecological status of coastal areas between Waimea Inlet and Cape Soucis into international or national importance.

It should be noted that a strict application of Schedule 2 in the draft NZCP would have identified most of the Nelson City coastline as having significant conservation value. This would be of minimal use to the Nelson City Council in preparing their RCP. This report, by concentrating on areas of national and international importance (by recognised sources), aims to highlight those areas which have particularly high values.

Evaluation into international or national status was based on:

1. Red Invertebrate Data Book (I.U.C.N.);
2. Conservation Status of New Zealand Wildlife (Bell, 1986);
3. Wildlife in the Nelson Region (Walker, 1987);
4. The First Order Coastal Resource Inventory (Davidson, et al., 1990);
5. Rare and Endangered Plants of New Zealand (Given, 1981);
6. Threatened Plants of New Zealand (Wilson & Given, 1989);
7. Landform Inventory (Priestly, 1990); and
8. Geological and Landform Inventory (Kenny & Hayward, 1993).

Areas not classified as nationally or internationally important often have considerable ecological value. For further information on coastal areas in Nelson and other parts of the Nelson/Marlborough region, refer to the Coastal Resource Inventory (Davidson, et al., 1990).

Information on landforms (and associated processes) is covered only to the extent possible on the basis of existing information held by the Department of Conservation. This aspect may be adequately covered by other agencies. It is noted that the landform inventory does not cover all sites in New Zealand.

Information on historic places is also covered using existing information only. This information is not, and cannot be, used in ranking sites.

Information on Maori cultural values is not, and cannot be, used by the Department in ranking sites at this stage, as there is no accepted ranking system. The information the Department has on Maori cultural values is included in this report, but should not be taken as an indication of preferences of the tangata whenua. The Department has approached tangata whenua in relation to areas of significant cultural value and is aware of existing knowledge and databases held by tangata whenua.

Recommended management options are made both in general terms, ie. based on common issues (see chapter 3), and in terms of site specific issues (see chapter 4). The options are recommendations only and reflect the current knowledge of particular issues and sites. Recommended management options are based on the principle of protecting, enhancing or restoring ecological values of these nationally and internationally recognised coastal areas within the Nelson City area. Management recommendations do not determine which agency has, or should have, responsibility for particular options.

In identifying areas of significant conservation value in the coastal marine area, reference is sometimes made to values above MHWS. There is a strong relation and interaction between terrestrial, intertidal and subtidal areas, particularly in terms of scenic and ecological importance. Therefore, some marine areas in the vicinity of highly valued terrestrial areas are considered to have high conservation value. While the Minister of Conservation cannot formally identify areas above MHWS as areas of significant conservation value under the RMA, nor specify RCA's for areas above MHWS, the Nelson City Council has clear responsibility under the RMA for such areas and values.

It is important to note that subtidal information for the Nelson City area is very limited. This highlights the need for a precautionary approach in management. Subtidal sites which potentially have value have not been identified in this document.

This document is divided into four chapters:

Chapter 1 and 2 deal with the ecological nature of sheltered and exposed shore types and highlights the need for their sound management.

Chapter 3 identifies general management principles, issues, and options for the coastal area. This section deals with flora, fauna and habitats, physical processes, water quality, coastal buffers and use.

Chapter 4 summarises and justifies each site's ecological values, specific issues and specific management recommendations.

STUDY AREA

The study area extends from the eastern side of Waimea Inlet, northwards to Cape Soucis, Nelson, with the offshore boundary being the 12 mile territorial sea limit. This report is confined to the coastal areas within this study area. It does, however, contain ecological information on the whole of Waimea Inlet. Waimea Inlet has been included as one unit because it represents an array of ecological processes which should be managed with regard to all parts of the system.

The study area is dominated by boulder, rubble, bedrock shores, and sand beaches/barrier spits and barrier enclosed estuaries. Sheltered estuarine environments are located in Waimea Inlet, Nelson Haven, Delaware Inlet and Whangamoia Estuary. All of these are shallow barrier enclosed estuaries with one or two entrances. All are stream or river fed and are surrounded by agricultural or urban development or regenerating forest. Nelson Haven is the only estuary with port and marina developments.

The exposed shores in the study area are a combination of boulder banks, rubble, sand beaches or bedrock. The exposed rocky coastline is characterised by steep cliffs and headlands which are continually depositing material into the marine environment. This rock material is transported in a southerly direction and has resulted in the formation of the Nelson Boulder Bank. Rocky shores are generally restricted to the intertidal and shallow subtidal (< 15m depth) and terminate in soft bottom areas dominated by combinations of sand, broken shell, silt, and mud substrates. These soft bottoms cover most of Tasman Bay.

The study area is characterised by a relatively sheltered aspect with few ocean swells, with wave action restricted to northerly storms and sea breezes. Wave action quickly subsides following wind events.

1. SHELTERED COASTAL ENVIRONMENTS

In Tasman Bay, sheltered coasts include: estuaries; intertidal flats; harbours; inlets; river mouths; coastal tidal wetlands; and partially enclosed bays.

Physical characteristics of sheltered coasts include:

- the rarity or absence of large waves or swells;
- shallow offshore areas;
- domination by fine sediments;
- tidal and/or freshwater currents; and
- mixed salinities including brackish waters.

The biological processes which operate in sheltered coasts have led to fragile communities and habitats sensitive to disturbance. Examples of these fragile communities include: bryozoan beds; horse mussel dominated communities; reef fish communities; saltmarsh and herbfields; and particular types of seaweed beds.

Sheltered coasts include some of the most biologically productive ecosystems of the world (Knox, 1986). These coasts contain unique communities that provide habitat, spawning or juvenile areas for fish, invertebrates, plants and birds. The extremely high productivity of sheltered coasts relates to the way that they trap nutrients washed in from the sea, as well as from the land upstream (Barnes, 1984; Knox, 1986). These nutrients provide the first link in a food web which involves plants and animals existing within, utilising, and depending upon these coasts, particularly many national and international migratory species.

Sheltered coasts are perhaps one of the systems most utilised and modified by humans (Knox, 1986). Many species of plant and animal found there have been harvested for food and other economic purposes, while many New Zealanders recreate or live in close proximity (McLay, 1976). These environments retain important historical and archaeological heritage.

The linkage between sheltered coastal systems, the adjacent land, its use and upstream catchment use, must be recognised in managing sheltered coasts. Good management of sheltered coastal systems depends on good catchment management.

1.1 NEED FOR MANAGEMENT

There are few unmodified sheltered coasts in New Zealand at present. They are, therefore, threatened habitats with many having a substantial reduction in area, and degradation from siltation, pollution or loss in water quality (Davidson & Moffat, 1990). Infilling, rubbish disposal, sewage disposal, port development, residential subdivision, aquaculture, fishing methods, land practices (such as forestry and fertiliser applications), sediment extraction, and roading have affected sheltered coasts. The impact of these modifications on sheltered coasts has often been widespread and long-term. It is essential that an important aim of resource management is to avoid or mitigate further loss, and to enhance or restore the remaining sheltered coastal systems.

Resource management policy statements and plans should recognise the fragile and vulnerable nature of sheltered coasts and the intense pressure placed on these environments by people. Policies and plans should emphasise the use and protection of sheltered coasts on a sustainable basis, and recognise that sheltered coasts need to be protected to maintain their own intrinsic values, their use to humans for recreation and economic purposes, as well as their importance as a valuable habitat for many species. Policies and plans should also recognise that areas of coast identified as having international or national importance should be managed to maintain, enhance or restore their ecological values.

2. EXPOSED COASTAL ENVIRONMENTS

No truly exposed shores are located in Tasman Bay, however, there remains the principle that some shore types have a greater degree of exposure. The open coasts of Tasman Bay represent a greater exposure level than the sheltered shores found within estuaries. Therefore, the open coastal areas of Tasman Bay can be regarded as exposed in relation to estuarine areas.

The biological processes which operate on exposed coasts have lead to relatively robust communities and habitats which are subject to disturbance usually through storm events. Examples of these communities include: Macroalgal (seaweed) beds, coarse sand beaches, rocky platforms and sea cliffs.

The north Nelson coast represent the most rugged coastline in Tasman/Golden Bay. Rocky reef platforms and sea cliffs are located here. The habitats and associated communities located on this shore type are dramatically different from those found in sheltered estuarine shore areas.

2.1 NEED FOR MANAGEMENT

Resource management policy statements and plans should recognise the rugged and changeable nature of exposed coasts. Change and catastrophic events may be a common event with erosion and accretion occurring regularly. Management needs to recognise that interruption of the dynamic processes can have considerable effects which are difficult to accurately predict. Exposed coasts have high seascape values which are quickly reduced by inappropriate or poorly designed developments on adjacent land.

3. GENERAL MANAGEMENT PRINCIPLES

Some issues on the Nelson coast are common to many areas. This section lists these issues and recommended management actions across the range of areas described in detail on the site record forms in Chapter 4. It is recognised that the Nelson City Council may be implementing some of these recommendations already and that others may not be strictly a Council responsibility. They are included to provide a comprehensive basis for discussion on the Regional Coastal Plan between the Council and the Department. There is no attempt made here to examine the full range of development activities found on the Nelson coast. The focus is rather on the qualities of the coast that need to be protected.

The issues and recommendations for management are divided into:

- 3.1 flora, fauna and their habitats;
- 3.2 physical processes;
- 3.3 water quality;
- 3.4 coastal buffers; and
- 3.5 use.

3.1 FLORA, FAUNA AND THEIR HABITATS

Issues:

Populations of coastal plants, animals and their habitats have been greatly modified by use and development of the coastal environment. Protection of remnant natural areas and the natural biological functioning of coastal ecosystems is fundamental to good coastal management.

Management Recommendations:

Protect rare, unique, vulnerable and representative ecosystems, communities, habitats and species occupying and/or utilising coasts.

Set aside adequate funding to protect and manage areas of national, international, regional or local importance. An ecological inventory could be used to identify, rank and evaluate these areas and values in need of protection.

Identify and establish effective boundaries/buffer zones related to specific management purposes.

Recognise the importance of primary production sources (eg. saltmarsh) and protect these areas.

Restore selected degraded or damaged coastal systems.

Avoid further loss and/or degradation of coastal habitat and buffer vegetation.

Prevent the release or spread of exotic species which have been shown to compete with natives (eg. introduced ice plant (*Carpobrotus edulis*), cord grass (*Spartina*), Pacific oyster (*Crassostrea gigas*)).

Recognise the threat of oil spills to ecosystems, communities, habitats and species on the coast.

Recognise the threat of plastic pollution and encourage clean-up operations.

Devise and implement the control of existing exotic species which are significant habitat modifiers, eg. *Spartina*.

Protect sensitive benthic communities from the effects of damaging fishing practices.

Investigate the impact of Pacific oysters on native communities.

Identify 'key indicator' species in order to monitor water and habitat change/quality.

Avoid draining, infilling or stopbanking coastal wetlands.

Avoid disturbances to areas that are important breeding sites, and migration and dispersal routes for indigenous species.

Recognise the lack of ecological information on subtidal environments and develop strategies to overcome this problem.

3.2 PHYSICAL PROCESSES

Issues:

Physical processes fundamental to the natural functioning of coastal ecosystems have, and are being, disturbed by use and development of the Nelson coast.

Management Recommendations:

Avoid the alteration of the natural flow of freshwater (including groundwater) or saltwater, into and out of coastal water.

Avoid the reduction of naturally occurring dissolved oxygen concentrations caused by both point and non point source discharges into coastal water (especially sheltered shores).

Avoid unnatural alteration of temperature, salinity and circulation patterns in coastal water.

Avoid an increase in the suspended sediment input into coastal water caused by changes in catchment activities or through coastal development.

3.3 WATER QUALITY

Issues:

Degradation of coastal water quality can diminish both human enjoyment of the coast and the natural functioning of coastal ecosystems.

Management Recommendations:

Avoid changes in catchment use that increase the discharge or run-off of nutrients, especially nitrogenous compounds and phosphates, into coastal systems.

Protect water quality from any discharge of persistent toxic substances directly or indirectly into the coastal environment.

Protect water quality from any discharge of untreated sewage into coasts either directly or via their catchment rivers.

Develop strategies to minimise the incidence of toxic substance spill accidents, particularly from shipping and land-based sources.

Establish and effectively manage riparian strips adjacent to the coast to buffer water quality from adverse effects of land use.

Monitor coastal waters, sediments, and aquatic species to provide background data on water quality.

Monitor to determine the effects of coastal discharges.

Require the on-land treatment of wastes and wastewater prior to discharge.

Require the on-land disposal of wastes and wastewater whenever possible.

3.4 COASTAL BUFFERS

Issues:

The habitat quality, natural functioning and aesthetic quality of the land/sea boundary is highly dependent on the maintenance of natural vegetation and landforms on the landward margin.

Management Recommendations:

Avoid significant modification to the coastal environment except where a coastal location is necessary and when there are no inland, land-based alternatives with lesser adverse environmental effect.

Establish protected coastal buffer strips, including riparian strips, adjacent to coastal systems to allow for the projected rise in sea level, to provide for the natural biological sequence from land to sea, and to buffer the coast from harmful effects of land use.

Discourage stock grazing and vehicle use at the land/sea interface through fencing, reserve/riparian strips and advocacy.

3.5 USE

Issues:

Coasts have highly valued resources. Active use of those resources can adversely effect passive users and future users, and the natural functioning of coastal ecosystems.

Management Recommendations:

Provide public access to coastal systems in a way which ensures minimum impact and provide interpretation facilities that encourage coastal conservation.

Locate industrial development away from sensitive coastal margins.

Safeguard open space values.

Protect sites valued by tangata whenua.

Prevent draining of wetlands.

Give preference to developments which require a coastal location over those that do not.

Close and seal existing rubbish tips located in the coastal environment.

Recognise particular recreational pursuits are not compatible with natural communities, species and habitats.

Provide appropriate areas for those recreational pursuits which compromise natural communities or ecologically important areas.

4. WAIMEA INLET TO CAPE SOUCIS

4.1 Summary and Justification of Ecological Values

4.2 Site Data, Issues and Management Recommendations

Waimea Inlet and Back Beach

Nelson Haven and Boulder Bank

The Glen to Cable Bay

Delaware Inlet and Spit, Pepin Island

Whangamoā Estuary

Whangamoā River Mouth to Cape Soucis

4. WAIMEA INLET TO CAPE SOUCIS

4.1 SUMMARY AND JUSTIFICATION OF VALUES

The study area (Nelson City Council boundary) extends from eastern Waimea Inlet to Cape Soucis, a distance of approximately 52 km of open coast. The total coastline, including the internal coast of estuaries, islands and spits is approximately 96 km.

Within this area, seven sites (Waimea Inlet and Back Beach; Nelson Haven; The Glen to Cable Bay; Delaware Inlet, Spit and Pepin Island; Whangamoia Estuary; Whangamoia River Mouth to Cape Soucis coastline) are considered nationally important. The Nelson Boulderbank (within Nelson Haven) and Back Beach (within Waimea Inlet) are regarded as internationally important. Collectively, the sites comprise approximately 71% of seaward coastline, or 84% of the total coastline. The total intertidal area of the sites is approximately 5,595 ha.

There are a number of important feeding, breeding, and roost sites present. Pied shags use Haulashore Island for breeding and roosting, while spotted shags have major roost sites at Ataata Point (Cable Bay) and Pepin Island. Nelson Haven is an important feeding area for wading birds with the upper reaches providing roost sites. Fur seals use Pepin Island as a haul-out site. Both the Whangamoia and Wakapuaka River mouth areas are probably important for whitebait spawning. Variable oystercatchers, white-fronted terns, black-backed and red-billed gulls, all breed on the Nelson Boulderbank.

A range of threatened species are present. The rare variable oystercatcher is found at the Boulderbank, Delaware Inlet and Whangamoia River mouth. The threatened Australasian bittern have been recorded at Wakapuaka. The threatened banded dotterel are present at Wakapuaka River mouth, Delaware Inlet and Whangamoia Rivermouth. Banded rail (also threatened) are found at Delaware Inlet and Whangamoia River mouth, the latter also has a population of the regionally threatened South Island fernbird. The threatened reef heron is found between Pepin Island and Cape Soucis. The Back Beach area at Tahunanui is the only known location of the endemic carabid beetle *Cillenum tillyardi*.

There are a number of areas of high value to the Maori community, especially the Delaware Inlet area. Archaeologically, the site at Rotokura is considered to be of national importance, but there are many other sites which may also be of high value. The lighthouse on the Boulderbank has an Historic Places Trust "1" classification.

A number of sites are considered to have high landform value, the Boulderbank is a landform of international significance, while Nelson Haven is considered to be of national significance. The area around Cable Bay/Pepin Island/Delaware Inlet is considered to be a unique assemblage of landforms.

4.2 SITE DATA, ISSUES AND MANAGEMENT RECOMMENDATIONS

Site Name/s: Waimea Inlet and Back Beach	CRI Site No. 10-031	Code: 01
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Recorders Name: Rob Davidson

Map No: N27 (m)

Grid Reference: 25220 59914

Date: 1 April 1993

Brief Description of Site: (Tasman Bay)

Waimea Inlet is a shallow bar-built estuary. The inlet is the largest enclosed estuary in the South Island (~ 3,455 ha), with an internal coastline of approximately 65 km. There are 10 islands within the inlet and 42,000 people living within 8 km of the inlet. The inlet is enclosed by Rabbit Island which limits tidal flow from the estuary to Tasman Bay via the Mapua (western) and Tahunanui (eastern) entrances. A combination of large tidal volume (up to 62 million cumecs of water) and the shallow nature of the inlet result in a relatively quick flushing action. Fresh water input into the inlet is from 22 small streams and the Waimea River (Davidson and Moffat, 1990). Normal flows from the Waimea River are approximately 19 cumecs, but floods of 2,000 cumecs have been recorded. The inlet and surrounding land have been occupied by Maori since the 1300's and Europeans since the 1840's. The estuary margins and adjacent land have been considerably modified over this period by industrial, urban and rural development.

Conservation Values:

Natural: Although the margins of the inlet have been significantly modified, areas within the inlet retain high biological importance (Davidson & Moffat, 1990). Areas of biological interest include: the whole western inlet; Orphanage Creek mouth; No-mans Island; O'Connor Creek; Pearl Creek; Higgs Reserve and Stringer Creek; Saxton Island and intertidal flats; MDF plant to Waimea River (Neiman Creek); Bells Island flats; Tahunanui embayment (Back Beach); Saxton Creek saltmarsh; and Aerodrome Peninsula flats. The inlet is utilized by 112 invertebrate species, 41 fish species (marine and freshwater) and 50 species of waterbird. These numbers are relatively high compared with other New Zealand estuaries (Davidson & Moffat, 1990). Of particular significance are visits by ~ 3,000 eastern bar-tailed godwit (*Limosa lapponica baueri*) and ~ 3,100 South Island pied oystercatcher (*Haematopus ostralegus finschi*). Fourteen species of wader utilize the inlet. The marginal areas that remain are important to the threatened (Bell, 1986) (=IUCN vulnerable) banded rail (*Rallus philippensis assimilis*) and Australasian bittern

(*Botaurus stellaris poiciloptilus*); also marsh crake (*Porzana pusilla affinis*). The inlet is important for juvenile flatfish and snapper. Large numbers of juvenile snapper (*Pagrus auratus*) have been recorded congregating outside the inlet (MAF Fisheries). The Waimea River mouth and associated areas are thought to be important for whitebait spawning, which has been observed at Neiman Creek (M. Ward, pers. comm.). Densities of invertebrates reach numbers as high as 76,000 per m². This represents a huge food source to the estuarine food chain (Davidson & Moffat, 1990). The endangered (Wilson & Given, 1989) coastal peppergrass (*Lepidium banksii*) is present, as is the endangered grey salt bush (*Atriplex cinerea*).

The Tahunanui Embayment or Back Beach is the only known location where the carabid ground beetle (*Cillenum tillyardi*) has been recorded. Investigations by Ian Townsend (carabid beetle expert) in the early 1970's of other probable locations for this beetle in Tasman Bay revealed no other records. The beetle appears to prefer sandy areas at vegetation edges above most high tides. This species appears to be very specific in its habitat requirements.

Rabbit Island represents a vital landform for the continued survival of Waimea Inlet. Rabbit Island was once a system of dunes and wetlands, the island now has few natural values. Isolated pingao (*Desmoschoenus spiralis*) plants are located on Rabbit Island. Pingao is a nationally threatened species and other than a few plants on Motueka Spit and at the Whangamoa River mouth, these are the only populations known in Tasman Bay (S. Courtney, pers. comm.). A small area of flax (*Phormium tenax*) exists near the eastern end of Rabbit Island. On the adjacent Rough Island, the only South Island record of the sedge (*Baumea articulata*) is known (Davidson & Moffat, 1990). A small wetland at the western end of the Traverse is the only Nelson location of *Isolepis prolifer*. As a landform, Rabbit Island is the best New Zealand example of a barrier island (Priestley, 1990). Many people use the area because of its quiet nature and pleasant seascapes.

Cultural: The intertidal flats at Aerodrome Peninsula are used by school students from Nelson and Stoke (Norriss & Davidson, 1989). The inlet is an important part of the Nelson landscape, especially as viewed from the adjacent hillsides at Nelson and in the Mapua area. Oral traditions record pre-'fleet' people on the Waimeas, and the first named occupiers, as Pohea's people who were believed to have come there in about 1,450 AD.

Historic: Approximately 33 known archaeological sites are recorded from the inlet and islands within the estuary. The majority of these sites are midden, however, a number of findspots are also recorded. Urupa are also located within the boundaries of the inlet. The inlet was an important area to the Maori, especially for food and materials. The Grossi Point/Mapua area is of particular archaeological importance. The inlet also has a rich European history which has resulted in extensive modification of the natural values of Waimea Inlet.

Site Importance:

Waimea Inlet : National
Back Beach : International

The Waimea Inlet is regarded as one large ecological unit having national importance. Sites of specific interest include the following:

Waimea Inlet is one of the only two known sites in New Zealand where the endangered (Wilson & Given, 1989) endemic coastal peppergrass (*Lepidium banksii*) grows naturally, the endangered grey salt bush (*Atriplex cinerea*) is also present (Davidson & Moffat, 1990). Ranked as an area of outstanding value to wildlife (Walker, 1987). The size and variety of habitats found in the estuary makes Waimea Inlet a nationally significant estuary. Nationally important to the endangered (Bell, 1986) white heron (*Egretta alba modesta*), the threatened (Bell, 1986) (= IUCN vulnerable) Royal spoonbill (*Platalea leucorodia regia*), Australasian bittern (*Botaurus stellaris poiciloptilus*) and banded rail (*Rallus philippensis assimilis*) (Davidson & Moffat, 1990).

Back Beach is the only known location of the endemic predatory beetle (*Cilenum tillyardi*).

Archaeological sites are abundant (Challis, 1978).

Draft New Zealand Coastal Policy Criteria For Areas of Significant Conservation Value

S 2.2 The area below MHWS has significance because of the adjacent protected areas, This recognises the sequence and linkages from terrestrial to subtidal habitats. No-mans Island is a Nature Reserve. The boundary of the reserve extends down to MHWM.

Davidson & Moffat (1990) proposed protective status for a number of areas within Waimea Inlet, some of which are being implemented (eg. esplanade reserves and covenant on Pearl Creek).

- S 2.3 The Inlet is considered to be of national significance by Davidson & Moffat (1990) and of outstanding significance to wildlife by Walker (1987).
- S 2.3(b) It is important for juvenile snapper and flatfish (Davidson & Moffat, 1990).
- Whitebait spawning has been observed in Neiman Creek and the whole Waimea River mouth is likely to be good spawning habitat (J. Preece, pers. obs.).
- S 2.4(b) Species present include the threatened banded rail, Australasian bittern, Royal spoonbill and the endangered white heron.
- S 2.4(c) The large intertidal area provides important feeding grounds for 14 species of waders including large numbers of eastern bar-tailed godwit and South Island pied oystercatcher (Davidson & Moffat, 1990).
- S 2.5 Several 'at risk' birds are present, including the endangered white heron and threatened Royal spoonbill, Australasian bittern and banded rail.
- Pingao (threatened) is present on Rabbit Island and the endangered coastal peppergrass and grey saltbush are present within the inlet (Davidson & Moffat, 1990). Back Beach has the only known population of the endemic carabid beetle (*Cillenum tillyardi*) (I. Townsend, pers. comm.).
- S 2.8 Rabbit Island is considered to be the best New Zealand example of a barrier island and a landform of national significance (Kenny & Hayward, 1993).

Human Modification and Human Use:

Modification of the estuary and surrounding land has been greatest in the eastern or Nelson side of the inlet. Here the urban centres of Stoke and Richmond lie adjacent to the inlet. Numerous industrial developments lie along the eastern margins, while farms and forestry surround the remaining estuary. Approximately 200 ha of estuary has been lost to reclamation and industrial development. Between 8,000-17,000 m³ of treated effluent is discharged into the eastern inlet per day. Three ski lanes exist, two in the eastern inlet and one adjacent to Mapua. The inlet and surrounding land is recreationally important to joggers, dog exercisers, duck hunters, fishers, whitebaiters and birdwatchers.

Existing Protection: There are some recreational reserves around Rabbit Island and occasional esplanade reserve around parts of the inlet. Oyster Island is a Recreation Reserve (~ 5 ha). Most of Rabbit Island is a Plantation Reserve. No-mans Island is a Nature Reserve.

Recorded on Existing Databases: CRI, 1990
WERI, 1988
SSWI - Outstanding
HPT County Inventories - Waimea County, 1985

Stringer Creek wetland on WERI
Trafalgar Road wetland on WERI

Issues:

Erosion is taking place on the estuary side of the Nelson airport, along the margins of the inlet from Monaco to the Craft Habitat and periodically at Tahuna Beach. Where erosion protection works have been constructed, these are out of character with the natural environment (eg. airport, golfcourse).

Spartina anglica has been present in large areas, with resultant trapping of silt, building up of estuary levels and displacement of natural communities. Control operations have reduced the area of *Spartina*.

Grazing is taking place at several locations on the eastern inlet. This results in destruction of saltmarsh communities, modification of wildlife habitats, and causes erosion which in turn releases fine sediment into the estuary.

Whitebaiting can cause localised damage to vegetation and streambanks through trampling.

The popularity of recreational shooting sometimes results in the death of non-acclimatised species.

Residential developments and subdivisions have reduced natural coastal values.

Industrial development has been allowed to take place directly adjacent to, and in, the estuary with consequent destruction of estuaries and buffer zone values. Public access is also inhibited by these developments.

Treated sewage disposal results in large amounts of nutrients being discharged into the estuary daily, with occasional further problems arising from maintenance, construction, or accidental disruption and spillage.

Illegal rubbish dumping periodically occurs. A refuse transfer station now operates at Richmond on land reclaimed from the inlet.

Gravel extraction operations have caused damage to saltmarsh vegetation in the past.

Transmission lines have had an adverse visual impact within the inlet.

Annual motorcycle racing on the Back Beach has caused damage to saltmarsh vegetation in the past and continued use is now preventing revegetation of these areas.

Management Recommendations:

An ecological report on Waimea Inlet (Davidson & Moffat, 1990) includes a chapter of management recommendations. This is a summary from that document.

Protective status is recommended for a number of areas in recognition of the area's outstanding ecological values. The western part of the inlet between Mapua and the Waimea River is recommended for protective status, as well as a number of other areas proposed for more specific protection (eg. wildlife management reserve). These include Back Beach, Orphanage Stream mouth, O'Connor Creek, Pearl Creek, Saxton Island Flats, Chip Mill to Waimea River, Higgs Reserve and Stringer Creek Flat, and the Bells Island Flats. Additionally, protection is proposed for areas important as whitebait habitat (and other native fish) including parts of Pearl Creek, Neiman Creek and O'Connor Creek.

Management recommendations for the inlet include:

- prohibit marine farming, commercial fishing, gill and drag netting, infilling, illegal rubbish dumping and unnecessary stopbanking, roading, and port development;
- prohibit motorbikes and cars on the estuary;
- set out in a management plan, areas where passive recreation (eg. sailing and boating, walking, dog exercise, bird watching) can be undertaken to avoid conflicting use;
- construction of adequate fencing around sensitive areas;
- provide protection to land adjacent to biologically important areas through management agreements or land purchase;
- replant vegetation both intertidally and immediately above the high tide zone, thereby creating a buffer strip.

Specific measures for the management of whitebait habitat include:

- recognition of spawning sites;
- establishment of plants suitable for spawning;
- discourage drainage of wetlands;
- minimizing of stopbanking, especially around the saltwater wedge;
- removal and discouragement of the use of culverts or other structures which interfere with migration pathways;
- fencing of spawning areas to prevent grazing of habitat;
- education of the public and relevant organisations.

Chapter 3 provides recommendations for the protection of estuarine plant communities. Given the highly modified nature of the estuarine margins, and their ecological importance, it is also recommended that enhancement of these margins take place through an active revegetation programme.

It is recommended that production of educational material and use of the estuary by school groups be encouraged. Education is an important part of estuarine management.

Currently access around the edge of Waimea Inlet is difficult; establishment of a walkway system around the entire margin of the inlet would improve this situation.

Establishment of strips to buffer both land and sea from the effects of sea level rise is recommended through an active programme of land retirement around the edge of the estuary. Restrictions on the type and form of development around Waimea Inlet should be formulated. The following guidelines are suggested:

- infilling (reclamation) of intertidal areas, particularly marginal vegetation, should only be approved in exceptional circumstances;
- no refuse tips or rubbish disposal/management schemes should be established in or adjacent to the estuary;
- existing rubbish tips or transfer stations adjacent to the estuary be relocated;
- new roadways should be discouraged in or directly adjacent to the inlet;
- coastal subdivision should be discouraged from areas directly adjacent to the inlet;
- housing and industry should be gradually relocated away from the edges of the inlet;
- the 20 metre esplanade reserve which may be formed if subdivision occurs, should be retained as a reserve, not as a road substitute;
- structures which destroy marginal vegetation or disrupt the natural flow of water or sediments should be discouraged;
- control of erosion using buffer strips and planting of marginal vegetation be encouraged. Wherever possible erosion should be left to take its natural course. Grazing of saltmarsh vegetation should be prevented;
- present discharge levels of treated sewage into the inlet should not be increased. A full investigation into the probable impacts on the inlet and investigation into alternative disposal options should be undertaken;
- faecal coliform bacterial, viral levels and nutrients should be monitored;
- industry, local government and local farmers and residents should be encouraged to remove rubbish which has been deposited into the inlet;
- the environmental implications of aquaculture in Waimea Inlet need to be very thoroughly assessed before being allowed to proceed. Commercial harvesting of cockles should be prohibited;
- any facilities to cater for additional recreational pressure need to be carefully assessed for their necessity, impact on the estuary, and effectiveness;
- powerboating , jet skis and hovercraft be restricted to particular areas of the inlet;

- the use of underground transmission lines be encouraged and the gradual replacement of existing aerial lines be encouraged;
- dis-used lines and poles be removed from the inlet and estuary margins;
- efforts be made to reduce sediment load from sources including catchment use, gravel extraction and dredging;
- construction of fences to limit livestock grazing be encouraged;
- the flow of Waimea River, small streams and ground seepage into the estuary not be significantly interrupted or altered;
- *Spartina* spraying in biologically important areas be prioritized;
- further biological surveys be undertaken at regular intervals. Areas of specific interest include: the distribution and changes in abundance of the Pacific oyster; impact of *Spartina*; loss of sediments and habitat classification; spread of vegetation cover over time; and the impact of sea level rises on estuarine boundaries and erosion rates.

Site Name/s: Nelson Haven & Boulder Bank	CRI Site No. 10-032	Code: 02
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Recorders Name: Elspeth Wingham/John Preece

Map No: 027 (m)

Grid Reference: 25355 59965

Date: 28 June 1993

Brief Description of Site: (Tasman Bay)

This site extends from Fifeshire Rock to The Glen (~17 km outer coastline) and includes Nelson Haven (excluding the Port area). Nelson Haven represents a further 21 km of coastline and ~1600 ha. The Boulder Bank is a natural spit of cobbles and boulders that separates the sheltered harbour of Nelson Haven from Tasman Bay and extends ~13.5 km south from The Glen to Nelson. Except at The Glen, it is separated from the mainland by ~1.5 km of estuary. The width of the Boulder Bank is relatively constant. At high tide its maximum width is ~55 metres and at low tide, it is up to 240 m wide. The Boulder Bank ends ~210 metres from the shoreline at Rocks Road, north of Magazine Point. In 1906 an artificial entrance to the harbour, "The Cut", was constructed through a low point. This action formed Haulashore Island. At the approach of the old entrance of the harbour, there is a prominent rock, Arrow Rock (or Fifeshire) Rock, which at low water is almost connected to a wave cut platform that extends out from Magazine Point.

In the south-east, the Maitai River flows into the Haven and the Brook and other small streams have formed a small alluvial plain on which the commercial area of Nelson City is sited. Between the commercial area and the port, a large area of the Haven, ~100 ha, has been infilled by hard and hydraulic fill. The estuarine area of the Haven consists of banks of mud and sand separated by channels at low water. Near to the port, many of the sand banks have been removed by dredging (Collyer, 1976).

Conservation Values:

Natural: The vegetation communities growing on the Boulder Bank are distinctive and cannot readily be compared to that of beach habitats. The main plant communities are mosses and lichens (Collyer, 1976). Three lizards are known from the Boulder Bank, they are the common gecko (*Hoplodactylus maculatus*), common skink (*Leiopisma nigriplantare maccanni*) and the spotted skink (*Leiopisma lineocellatum*) (Collyer, 1976). There are small pockets of coastal forest, eg. at Clifton Terrace and in other gullies (Davidson, et al., 1990) These need further investigation. Nelson Haven is an important feeding and roosting area for waders (J. Preece, pers. comm.). The most conspicuous

waders are the summer migrants, eg. flocks of eastern bar-tailed godwit (*Limosa lapponica baueri*). Pied shags (*Phalacrocorax varius varius*) breed in pine trees on Haulashore Island. A small number of rare (Bell, 1986) variable oystercatchers (*Haematopus unicolor*) nest along the Boulder bank; threatened (Bell, 1986) (= IUCN vulnerable) banded dotterels (*Charadrius bicinctus bicinctus*) breed on the saltmarsh flats and black-backed (*Larus dominicanus*) and red-billed (*Larus novaehollandiae scopulinus*) gulls breed at varying numbers on an annual basis. White-fronted tern (*Sterna striata*) also breed on the Boulder Bank (Walker, 1987). Many ducks, during moult, seek shelter near the sewage ponds at the head of the Haven. Australasian bittern (*Botaurus stellaris poiciloptilus*), a threatened species (Bell, 1986) (= IUCN vulnerable) has been recorded from the raupo swamp which is part of the Wakapuaka Wildlife Reserve.

Since 1992, a dramatic increase in the cover of eelgrass in the Haven has occurred (R. Davidson, pers. comm.). The reasons for this phenomenon are difficult to determine, but these large eelgrass beds represent a highly productive environment (Davidson, 1992; Knox, 1986).

The Boulder bank is a landform considered internationally important, while the Haven is recognised as a nationally important landform (Priestley, 1990; Kenny & Hayward, 1993). Both the cliffs and Magazine Point areas are considered by Kenny & Hayward (1993) to be regionally important for their value as the first recorded fossil site in New Zealand and as a site to illustrate sedimentological features respectively. Also, the Boulder Bank/Nelson Haven area is of known scientific value as it has been studied over a long period of time by Cawthron Institute.

Cultural: 'Archaic' Maori camps were sited on the large boulders just over the crest of the Bank and it is likely that layers of flax and raupo from The Glen would be laid on the boulders inside the sleeping huts. The dry and warm Boulder Bank had plentiful fish, intertidal shell-fish, and bird life abundant in the nearby bush and in the Haven. Fresh water was available at The Glen and freshwater mussels were plentiful. The Maori used granodiorite boulders as hammerstones. Boulders of up to 60 kg have been found in the argillite quarries on D'Urville Island and in the Upper Maitai and the Whangamoas. These boulders must have been transported by canoe and overland for distances up to 100 km.

The Maori used the Haven for fishing and there were numerous settlements along the shore such as Te Rere a Hihi at the Glen (see CRI, 1990: 10-0033), the eel pond of Queens' Garden, Matangi Awhea at Auckland Point and Te Punawai near the bottom of Richardson Street. The Boulder Bank was probably visited for short periods. In 1827/28 Te Rauparaha's allies of Ngati Tama, Ngati Rarua and Te Atiawa sailed down the Boulder Bank and attacked the local settlements; when the first Europeans arrived a few years later, no Maori remained in residence. In

1845 James MacKay found traces of foundations of whares on the northern end of the bank, but there were no huts remaining (Collyer, 1976).

The whole site has considerable land/seascape value, especially viewed from the Port Hills and from the air (J. Preece, pers. obs.). Spiritually important as a long occupied area.

Historic: In 1841, Captain Wakefield sent a boat with five people aboard "*to see if there is any bay, inlet or river suitable for a town site*". They sailed southwards from Pepin Island and along the Boulder Bank until they put ashore and saw the waters of Nelson Haven. They entered the Haven between Haulashore and Arrow Rock and sailed on to Auckland Point (Cawthron, 1976).

Haulashore was used for beaching ships until the 1860's where repairs were made to ships (Cawthron, 1976)

In the early days of ships bringing stock from Australia (1842), sometimes Haulashore was used as a holding paddock for prospective buyers to view the stock. In 1843 a Stone Powder magazine was built on the Boulder Bank. It was destroyed 100 years later because it was considered dangerous. In 1862 the lighthouse, built of octagonal cast iron plates painted white, was ready to operate. It was manned by two keepers who had their houses and domestic buildings around its base. In 1915 the new un-watched beam was installed and the keepers houses and shed removed (Cawthron, 1976).

The Cut was considered a necessity because the channel and harbour were becoming blocked with sand because the eastern mouth of the Waimea River no longer flowed out near Arrow Rock and in fact flowed to the west nearer Mapua. The Nelson Harbour board was set up in 1901 and work started on the Cut in 1903. It was 61 m (200') wide. It has since been widened to 152 m (500') and minimum depth is maintained at 9 m (30') at high tide (Cawthron, 1976).

The most noteworthy wreck was that of the "Fifeshire" in 1842 on Arrow Rock. During the early days, the Boulder Bank was regarded as an endless source of cheap road metal. The gravel was loaded onto a barge at Haulashore Island and sailed up the harbour to the Gasworks Wharf. Here the boulders were crushed with a steam-driven crushing plant (Collyer, 1976).

Site Importance:

Boulder Bank : International
Haven : National

The Boulder Bank is considered an internationally important landform, while the Nelson Haven is classified as a nationally important landform (Kenny & Hayward, 1993). The Haven is of national importance as a major feeding area and roost for

migratory waders. Also banded dotterels (*Charadrius bicinctus bicinctus*), Australasian bittern (*Botaurus stellaris poiciloptilus*) and variable oystercatchers (*Haematopus unicolor*) which are nationally threatened species (Bell, 1986) breed here (Walker, 1987). The "Archaic" Maori sites along the Boulder Bank may be nationally important. Regionally, the moss and lichen communities are only found on the Boulder Bank and the local species of dwarf kowhai is only found on Haulashore Island (Collyer, 1976). Also, the Haven estuarine area is locally and regionally important as a nursery and feeding area for fish.

The lighthouse has an Historic Places Trust "1" classification, ie. its permanent preservation is essential.

Draft New Zealand Coastal Policy Criteria For Areas of Significant Conservation Value

- S 2.2 The area below MHWS has significance because of the adjacent protection areas. This recognises the sequence and linkages from terrestrial to subtidal habitats:

The Boulder Bank is a Scenic Reserve.

Some of the sandflats at the head of the Haven are within the Wakapuaka Wildlife Reserve.

- S 2.3 The Boulder Bank provides shelter for Nelson Haven, creating the estuary and allowing development of the Port Nelson area.

- S 2.4(b) The rare (Bell, 1986) variable oystercatcher are present and the threatened (Bell, 1986) (= IUCN vulnerable) banded dotterel and Australian bittern (Walker, 1987).

- S 2.4(c) The whole Haven is an important feeding area for waders, and the upper reaches are important roost sites (Walker, 1987).

The rare variable oystercatcher and the threatened banded dotterel and Australian bittern are present.

- S 2.8(c) The Boulder Bank is considered to be a landform of international significance, while Nelson Haven is of national significance (Kenny & Hayward, 1993).

Human Modification and Human Use:

The land area adjacent to Nelson Haven is highly developed, ie. Nelson City Port and suburbs. Seven cottages were built in the early 1900's on the Boulder Bank. There are major reclamations, ie. industrial area of the Port, causeways in Nelson Haven and at the head of the estuary (Davies, 1931; Armstrong & Knox, 1985).

The commercial port of Nelson and the main area for small boat moorings and marinas is in the Haven. The sewage outfall at the Boulder Bank puts treated sewerage from the adjacent ponds into Tasman Bay. There is also an outfall at the Boulder Bank from a local fish factory. The Cut is an artificial opening in the Boulder Bank that provides a safe entrance into Port Nelson.

Fishing, bird watching, walking and horse riding and exercising dogs are some of the shore-land based recreational activities. Yachting, swimming, power boating, wind surfing, canoeing, rowing and jet skiing are the main water-based recreational pursuits. The area was traditionally used for fishing and gathering of shellfish by the Maori.

Existing Protection:

At the head of Nelson Haven is the Wakapuaka Wildlife Reserve (4 ha). The Boulder Bank is a Scenic Reserve which has reverted to the Crown. Arrow Rock is Crown land and Haulashore Island is City Council land. Small remnants of coastal forest along the Atawhai foothills are administered by the Council.

Recorded on Existing Databases:

CRI, 1990.

SSWI - Nelson Haven = (site 195). Site of high value (Walker, 1987).

Geopreservation - Boulder Bank, classification "1" (of international importance).

HPT County Inventories - No. 41, Nelson lighthouse, Status 'A'. Cross Landing, Nelson Plaque 1965.

Issues:

The port area has a marina, but "demand exceeds supply", and enlargement of the marina is planned. Rowing, yachting and cruising clubs and the sea scouts are sited near the port area. People fish from the wharves and canoes, power boats, yachts, wind surfers and people on jet skis use the inner harbour.

In the past, large amounts of boulders have been removed for roading and infilling, but by July 1972, the Harbour Board planned to take no more and no private contractors were allowed to remove stones (Collyer, 1976). A breach of the bank could have serious consequences.

The harbour constantly requires dredging to remove sediment transported in by tributaries. The catchments are being increasingly modified by residential development and forestry.

Demand for recreational and commercial boat facilities and industrial land is high and has resulted in substantial infilling.

The high degree of industrialisation coupled with the high level of shipping creates the potential for major pollution events, as well as many minor events.

Pollution from nutrient run-off and effluent from tributaries has caused mild nutrient enrichment, which could lead to algal blooms.

Triathlons are run along the Boulder Bank and have the potential to impact on bird breeding.

Dogs being exercised along Sewerside Drive sometimes disturb birds roosting at the head of the Haven, and within the Wildlife Reserve.

Rabbits browse Boulder Bank vegetation.

Back owners on the Boulder Bank occupy public land and have introduced a range of exotic plants.

Gorse (*Ulex europaeus*), broom (*Cytisus scoparius*) and the introduced ice plant (*Carpobrotus edulis*) all threaten natural plant communities.

Rubbish dumping on the Boulder Bank introduces new weed species.

Vehicle access onto the Boulder Bank damages vegetation communities, and lizard habitat.

Occasional failure, or problems in the sewerage pipework has caused sewage leaks into the Haven.

Management Recommendations:

Land disturbance activities within the catchment need to be carefully controlled and monitored to minimise sediment and nutrient input. Create a strip to buffer both land and sea and replant where possible.

Further reclamation in the Port area should consider ecological values and should only occur in exceptional circumstances. Use of the existing reclamation should be rationalised and priority given to those activities which require a port/coastal location.

An integrated pollution management strategy is required for the whole Nelson Haven.

A statement of management intent needs to be drawn up for both Boulder Bank and Wakapuaka Wildlife Reserve, covering such aspects as weed and pest control, access, revegetation and rubbish dumping.

An ecological monitoring programme in the Haven and Boulder Bank should be established.

Removal and discouragement of the use of culverts or other structures which interfere with natural estuarine processes or disrupt the natural flow of water or sediments.

Site Name/s: The Glen to Cable Bay

CRI Site No. 10-033

Code: 03

Recorders Name: Elspeth Wingham/John Preece

Map No: 027 (m)

Grid Reference: 25425 60042

Date: 28 June 1993

Brief Description of Site: (Tasman Bay)

The Glen (or Glenduan) is located at the northern end of the Nelson Boulder Bank. Steep coastal cliffs begin at The Glen and continue along the coast to Cable Bay, a distance of ~6.5 km. These cliffs are formed from 'Tasman Intrusives' (Franko, 1988). These cliffs are continually eroding and are the most important source of materials which have formed the Nelson Boulder Bank (Collyer, 1976).

At Cable Bay, to the north, a natural boulderbank connects the mainland with Pepin Island.

Conservation Values:

Natural: In gullies north of The Glen, there are coastal forest remnants with karaka (*Corynocarpus laevigatus*) and nikau palm (*Rhopalostylis sapida*). The rocks near Ataata Point (and around Pepin Island) are an important roost for ~2,000 spotted shag (*Stictocarbo punctatus punctatus*) (Walker, 1987).

Subtidally, the area represents habitat for a variety of reef species (R. Davidson, pers. comm.). From 0-10 metres depth, the area is a mixture of boulders and outcropping rock with a dominant weed cover of flapjack (*Carpophyllum maschalocarpum* and *C. flexuosum*). Below 10 metres depth the bottom slopes gently and is primarily fine sands and mud (R. Davidson, pers. comm.). It is considered to be representative of the rocky shore/reef habitats of the north Nelson coastline.

Cultural: The Glen, Cable Bay area had Maori occupation sites and was part of a traditional fishing ground (Harvey, 1989). The name 'Te Rere a Hihi' was given to The Glen in 1827/28 to describe the flight of Hihi who was a member of a Ngati Tama/Ngati Rarua/Te Atiawa party which attacked the resident hapu (probably Ngati Apa/Ngati Kuia). Hihi had got ahead of his support party and suddenly found himself surrounded by enemy warriors. In a desperate bid to escape, he ran down the valley and launched himself into space - possibly over the bluffs. Luckily the dense flax then growing up the face broke his fall and he slid in a most spectacular fashion to rejoin his supporters who were amassing on the shore below. There is a strong belief by

Maori that this is the pa site referred to as "Skoī tehai" (ie. "Te Rere a Hihi") and variants thereof, as given by D'Urville in his log (J. Mitchell, pers. comm.).

The coastal cliffs at The Glen and the Cable Bay area have land/seascape value (J. Preece, pers. obs.).

Historic: Cable Bay's present name was due to the siting of New Zealand's first overseas telegraphic cable link which came ashore on 5 February 1876. Two cable laying ships set out from Botany Bay, Sydney to Cable Bay. Due to exceptionally calm weather in the Tasman Sea, they took only 11 days. The new cables came into operation on 21 February 1876 and caused great excitement as it meant that colonists could communicate with friends and relatives in England by telegram taking only four days instead of by letter which took up to six months by sailing ship. A fire in 1914 hastened the end of the cable station (walkway pamphlet).

At the edge of Cable Bay, there is an 'archaic' Maori campsite of national importance. It was occupied periodically at least from the beginning of the 14th century (Butts, 1977).

Site Importance:

National

Archaic Maori site, Rotokura is of national importance (Butts, 1977). Regionally important are the remnants of coastal forest and the site is locally important as a major roost site for spotted shags (*Stictocarbo punctatus punctatus*) (E. Wingham, pers. obs.). The area is recognised as a potential marine reserve site and is under investigation by the North-Nelson Marine Reserves Coalition.

Draft New Zealand Coastal Policy Criteria For Areas of Significant Conservation Value

S 2.2 The area below MHWS has significance because of the adjacent protected areas. This recognises the sequence and linkages from terrestrial to subtidal habitats:

Cable Bay Recreation Reserve which includes the boulderbank.

Several covenants protect areas of coastal bush from The Glen to Cable Bay.

S 2.4(c) Ataata Point is an important roost site for spotted shags (Walker, 1987).

S 2.7 The site known as Rotokura, adjacent to the coast is considered to be of national significance (Butts, 1977).

**Human Modification
and Human Use:**

The flat land near The Glen behind the boulderbank was flax swamp (E. Wingham, pers. comm.), but has been reclaimed and is now used for dairy farms. Shoreland-based recreation in the area is surfcasting, bird watching, rock climbing and walking along the coast or over the Cable Bay Walkway. The coastline here was part of a Maori traditional fishing ground (Harvey, 1989).

Existing Protection:

The boulderbank at Cable Bay is a Recreation Reserve, while areas of coastal forest totalling more than 300 ha are covenanted.

**Recorded on Existing
Databases:**

CRI, 1990.

SSWI - Site 171: Pepin Island and Ataata Point. Both moderate to high value (Walker, 1987). Site 173: Drumduan remnants of moderate to high value. Coastal lowland forest remnant with transferred population of the land snail (*Powelliphanta gilliesi subfusca*).

HPT County Inventories - Used to locate sites, Waimea County, 1985.

Issues:

Cable Bay is a high use recreational area because of its proximity to Nelson. The area around Ataata Point, Cable Bay is regularly spear-fished. People surf-cast north of the car-park at The Glen and off the rock beaches at Cable Bay. This combined pressure appears to have depleted fish, paua and crayfish in the area (Duffy, 1989).

Goats graze the cliffs, causing damage to vegetation and probably increasing the erosion rate.

Wilding pines are present on cliffs, and will probably spread.

The suitability of the area as a marine reserve deserves further investigation.

Management Recommendations:

Pest and weed control is desirable for goats and pines.

Investigate potential for marine reserve status.

Being close to Nelson, it is an important recreational area and any opportunities to enhance or facilitate recreation should be taken.

Encourage retirement of cliff areas from farming and fence to prevent stock access.

Site Name/s: Delaware Inlet and Spit, Pepin Island	CRI Site No. 10-034	Code: 04
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Recorders Name: Elspeth Wingham/John Preece

Map No: 027 (m)

Grid Reference: 25475 60055

Date: 28 June 1993

Brief Description of Site: (Tasman Bay)

This site extends from the northern end of Cable Bay to the base of the Delaware Spit (~10 km) and includes Pepin Island. Delaware Inlet is a shallow estuary (~420 ha) located 17 km north-east of Nelson. The inlet is enclosed by a boulderbank which links Pepin Island to the mainland and a sand spit with a single narrow entrance (Kenny & Hayward, 1993). The Wakapuaka River enters the inlet at the most southern point of the estuary. Delaware Inlet is regarded as a relatively unmodified estuarine area (Davidson, et al., 1990). The Spit is a ~50 metres wide, cobble and sand bar extending ~2.25 km. Pepin Island has a coastline of ~11 km, while the internal coastline of the inlet is ~12 km.

Delaware Bay is the sea area boarded by Pepin Island in the west and the Whangamoia range in the east. Adjacent land use around Delaware Inlet and the Spit is pastoral farming.

Conservation Values:

Natural: Delaware Inlet is an estuary with a high degree of naturalness and has areas with intact vegetation sequences from saltmarsh through to coastal forest on Bishops Peninsula, and on some hillsides (Davidson, et al., 1990). Also on the Spit, there is a remnant of coastal akeake (*Dodonaea viscosa*) forest on sand, which is uncommon, and a small population of spinifex (*Spinifex sericeus*). A remnant area of alluvial coastal forest is located at the mouth of the Wakapuaka River. Forest on sand, spinifex and alluvial coastal forest are all regionally rare plant communities (S. Courtney, pers comm).

Banded Rail (*Rallus philippensis assimilis*), banded dotterel (*Charadrius bicinctus bicinctus*), and variable oystercatcher (*Haematopus unicolor*) have been recorded breeding in Delaware Inlet (Walker, 1987). Delaware Inlet is an important breeding and nursery area for fish species (Franko, 1988).

Pepin Island is an important winter roost for spotted shag (*Stictocarbo punctatus punctatus*) a breeding site for white fronted tern (*Sterna striata*) and probably reef heron (*Egretta sacra sacra*) (Walker, 1987).

New Zealand fur seals use Pepin Island as a haulout site, and it may develop into a nursery (R. H. Taylor, pers. comm.).

Landforms include the sandpit (a tombolo) representing the seaward boundary of the estuary and Bishops Peninsula, that projects into the estuary and is covered with coastal forest. A natural boulderbank links Pepin Island to the mainland and separates Delaware Inlet from the sea. Another remnant boulder bank is located subtidally on the seaward side of the existing bank. Pepin Island is steep with rugged coastal cliffs. It is farmed and there are coastal forest in gullies. This range of geological features are regarded by Kenny & Hayward (1993) as "*a unique combination of features*".

Delaware Inlet provides an estuarine habitat that is largely unmodified and of scientific value. It has been studied by Cawthron Institute staff (Franko, 1988).

Cultural: Delaware Inlet was a former occupation site. The area has high aesthetic and seascape values, eg. Bishops Peninsula and Delaware Spit, which are also spiritually important sites. There is a rahui over the Delaware Inlet area. Maori Reserve Land is located along the landward side of the road to Delaware Spit (Mitchell & Mitchell, 1990).

Historic: There are a large number of archaeological sites in the Delaware Bay/Cable Bay area. On the lower south-west slopes of Pepin Island, the Maori had a garden area (J. Elkington, pers. comm.). A brigantine, the 'Delaware', was wrecked in the bay in 1863, and all but one of the crew were rescued by local Maori, including Huria Matanga.

Site Importance:

National

Nationally important because the threatened (Bell, 1986) (= IUCN vulnerable) species, banded rail (*Rallus philippensis assimilis*), banded dotterel (*Charadrius bicinctus bicinctus*) and reef heron (*Egretta sacra sacra*) are present. The rare variable oystercatcher (*Haematopus unicolor*) is also present at this site. Regionally, it is an unmodified estuarine area and is an important nursery area for fish species. Locally, it is important to the Maori community for spiritual reasons and is a traditional food collecting area. There are a large number of historical sites within a small area. Coastal forest located on Bishops Peninsula and at the Wakapuaka River mouth are regionally important.

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- S 2.1 The area is regarded as being important to Maori as a major centre of occupation, both historic and recent. A number of sites are considered waahi tapu, and it is also important as a mahinga maataitai area (S. Bagley, pers. comm.).
- S 2.3(c) The extensive tidal flats and saltmarsh are relatively unmodified (S. Courtney, pers. comm.).
- S 2.4(a) Fur seals use Pepin Island as a haulout site (R. Taylor, pers. comm.).
- S 2.4(b) The threatened (Bell, 1986) (= IUCN vulnerable) banded rail, banded dotterel and reef heron are present (Walker, 1987).
- S 2.4(c) Pepin Island is an important roost site for spotted shag (Walker, 1987).
- S 2.5 The forest on sand on Delaware Spit is a regionally threatened ecosystem (S. Courtney, pers. comm.).

The threatened banded rail, banded dotterel and reef heron are present.

Human Modification and Human Use:

Almost all the land adjacent to Delaware Inlet has been cleared of coastal forest and is used now for pastoral farming. Shoreland-based recreation in the area includes walking (and fossicking), picnicking, surfcasting, white-baiting and bird watching. Water-based recreation includes swimming, sailing and fishing. Flax is gathered from an area near the base of the Delaware Spit (Mitchell & Mitchell, 1990).

The area was a traditional fishing ground for the Maori. The boundary went from Whangamoia Heads in a straight line to the western-most point of Pepin Island, then in a direct line to The Glen and down to the boulderbank where the original survey line met the coast (Harvey, 1989).

Existing Protection:

Cable Bay Scenic Reserve - for 3 ha coastal forest.

Private Protected Land - (Owners - Stuart's) - area of 0.5 ha native bush near between The Glen and Cable Bay.

Cable Bay Walkway - Easement for the public right of way in favour of the Crown. Note: closure due to lambing at landowner's request.

Cable Bay Recreation Reserve - covers most of the Boulder Bank area excluding the road.

A 20 metre Esplanade Reserve borders Delaware Spit.

Esplanade Reserve - between residential sections and the estuary at Cable Bay.

Rahui - covers Delaware Inlet

Recorded on Existing Databases:

CRI, 1990.

WERI, 1988.

SSWI - Pepin Island = site 171, Wakapuaka River Mouth = Site 172. Both of moderate/high value (Walker, 1987).

HPT County Inventories, Waimea County 1985.

Other Considerations:

The Maori community are interested in land claims for this area: *"Under the newly introduced English laws, pressure came upon the Wakapuaka people to obtain a Certificate of Title to the land. This non-traditional concept of land ownership was resisted until 1883, at which time title was awarded to Huria Matenga ... The majority of the land soon passed out of Maori ownership from Huria Matenga to her husband by European law of Will and Testament, and finally by subdivision and sale."* (Franko, 1988).

Issues:

At present, archaeological sites on the spit are under threat from cattle grazing and trampling, burrowing by rabbits and from people fossicking. The area of akeake forest on the Spit is vulnerable to fire. All sandspit vegetation is under threat from grazing. Stock are causing riverbank erosion.

Coastal forest remnants on the cliffs are browsed by goats which hinder revegetation and alters the abundance and range of species present. Alluvial forest remnants are also being grazed.

Continued residential development is a threat. Also, on sections at Cable Bay some residents periodically extend their gardens down to the estuary, encroaching on esplanade reserve. Lack of legal access also restricts public use.

The area is very close to the heart of the Maori community.

Management Recommendations:

Prevent stock from grazing the estuary and sandspit. Rabbit control on the sandspit is necessary.

Monitor esplanade reserve boundaries to ensure no encroachment. Fencing would aid this.

All developments or proposals in this area need to be discussed with the Maori and local community at the earliest possible stage.

All opportunities to acquire land for conservation purposes around the edge of the coast, estuary and rivers should be utilised. A strong case should be made to acquire the sandspit and the alluvial forest area at the mouth of the Wakapuaka River, both of which will require some restoration.

Encourage the establishment of riparian strips along the river to reduce erosion, stabilise riverbanks, prevent sediment reaching the river and estuary, as well as providing habitat and increasing the area of lowland forest.

Site Name/s: Whangamoia Estuary	CRI Site No. 10-036	Code: 05
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Recorders Name: John Preece
 Map No: 026 (m)
 Grid Reference: 25553 60110
 Date: 28 June 1993

Brief Description of Site: (Tasman Bay)

This estuary (~ 120 ha) is surrounded by steep hills and fronted by a sandspit with a narrow entrance. There are significant areas of alluvial flats around the mouth of Toitoti Stream and the main river. The western side of the inlet is mostly in regenerating shrubland, with pine plantations at higher elevations. The eastern side is grazed with large areas of pasture and shrubland. Some very small forest remnants remain. The estuary has relatively large areas of saltmarsh, with the vegetation sequence including native shrub and forest. The estuary itself is relatively unmodified.

The area is an important archaeological area, especially the sandspit.

Conservation Values:

Natural: The main body of the estuary is relatively unmodified. Large areas of mud and sandflat are present, with several small forest remnants (on alluvium). Areas of shrubland are present, a rarity in Nelson estuaries (J. Preece, pers. obs.). The shallow estuary provides excellent feeding grounds for waders; banded rail (*Rallus philippensis assimilis*), marsh crake (*Porzana pusilla affinis*), South Island fernbird (*Bowdleria punctata punctata*), banded dotterel (*Charadrius bicinctus bicinctus*) and variable oystercatcher (*Haematopus unicolor*) (Walker, 1987). The freshwater wetland remnants and mouth of the Whangamoia River are probably important whitebait spawning areas (J. Preece, pers. obs.). A sandspit encloses the estuary, with small remnant areas of pingao (*Desmoschoenus spiralis*).

Cultural: Culturally the area is important as a major occupation site.

Historic: The sandspit is considered to be one of the best examples of river mouth occupation sites in the Nelson area (S. Bagley, pers. comm.). Evidence of occupation over 1200 years ago has been recorded and it is likely the site was occupied for long periods. Freshwater shellfish and estuarine fish species were close at hand, while the mouth provided canoe access to the open

sea. This is a large site with numerous ovens and midden. It was also important as a tool manufacturing site, with the raw materials coming from argillite quarries further up the Whangamoia Valley. Other sites are recorded from the surrounding area.

Site Importance: National

May be of national importance due to its archaeological sites. Considered to be one of the best examples of a river mouth occupation site in Nelson, with a history of occupation dating back ~1200 years (S. Bagley, pers. comm.).

Of national importance for the presence of the threatened (Bell, 1986) (= IUCN vulnerable) banded rail (*Rallus philippensis assimilis*) and banded dotterel (*Charadrius bicinctus bicinctus*). Also has the regionally threatened South Island fernbird (*Bowdleria punctata punctata*) and the rare variable oystercatcher (*Haematopus unicolor*) (Walker, 1987; G. Elliot, pers. comm.).

Regionally important as a relatively unmodified estuary (Davidson, et al., 1990).

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S 2.3(c) The estuary margins are relatively unmodified (Davidson, et al., 1990).

S 2.4(b) Habitat for the threatened (Bell, 1986) (= IUCN vulnerable) banded rail and banded dotterel, the regionally threatened South Island fernbird, and the rare variable oystercatcher (Walker, 1987).

Human Modification and Human Use:

There is one house, which is privately owned and isolated, so public use is almost non-existent. Much of the immediate catchment has been burnt off in the past and is now regenerating in gorse (*Ulex europaeus*), manuka (*Leptospermum scoparium*) or tauhinu (*Cassinia leptophylla*). The hills on the western side of the estuary are in this category, with occasional bush remnants in gullies and tall kanuka (*Kunzea ericoides*) on the middle slopes, and pines at higher elevations. The eastern side has been developed and regeneration is not as advanced, with some areas of pasture. Wetlands have been drained. Grazing has caused erosion on the spit.

Existing Protection: Nearly all the land is private and unprotected, with the exception of a Section 58 (Land Act) strip, now a marginal strip under the Conservation Act, which runs along the open coast to the base of the spit and inside part of the estuary. This strip has been allocated to the Department of Conservation, as it is without title.

Recorded on Existing Databases: CRI, 1990.
WERI, 1988.
SSWI - moderate/high.
HPT County Inventories - Waimea County 1985.

Issues:

Increased sediment input from upstream sources has already resulted in higher bed levels (J. Preece, pers. obs.). If this continues it may threaten the long-term integrity of the aquatic habitats. Potential sources of sediment include forestry operations and stock grazing on the riverbanks.

Grazing is damaging the saltmarsh community within the estuary, the riverbanks, and especially the sandspit area where vegetation, archaeological sites, and the structural integrity of the spit are being damaged.

Freshwater wetland has been drained, reducing the area available for whitebait spawning and fish habitat.

Marram grass out-competes native vegetation on the spit.

Rabbits are damaging archaeological sites.

Old mans beard, possums and grazing threaten the small bush remnant at the head of the estuary.

Management Recommendations:

A careful scrutiny of all land use applications is required to ensure that sediment does not reach waterways; monitoring is needed to achieve this.

Encourage riparian strip management. Establishment of riparian strips along the Whangamoia River and its tributaries would help to stabilise the riverbanks, reduce bank erosion, intercept sediment and reduce sedimentation of the estuary. In addition, it would provide improved habitat for freshwater animals and increase the area of lowland forest.

Prevent stock from grazing the estuary and sandspit. Some rabbit control may be necessary on the sandspit.

Long-term, revegetation of the sandspit is desirable, using naturally occurring species.

Bush remnants require fencing and weed control.

Site Name/s: Whangamoia River Mouth to Cape Soucis	CRI Site No. 10-037	Code: 06
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Recorders Name: John Preece
 Map No: 026 (m)
 Grid Reference: 25580 60155
 Date: 28 June 1993

Brief Description of Site: (Tasman Bay)

The site consists of the area between the Whangamoia River and Cape Soucis, ~8.5 km. The predominant landform is steep coastal cliffs and steep hill sides. Areas of boulder or rocky shore dominate, with rocky headlands and two small, sandy beaches complete with dunes. Several rock stacks and reefs are present. The cliff faces have a modified form of coastal shrubland and forest present, with either pines or, in some cases, native forest behind. The sand dune areas are notable for the presence of Spinifex (*Spinifex sericeus*), one of the native sand binding plants.

Conservation Values:

Natural: Conservation values are little known. The coastal cliffs have their distinctive shrub/forest vegetation communities, with patches of herbs climbing to the steeper sites. Notable for this region is the presence of *Peperomia urvilleana*. Further inland are large areas of coastal forest (J. Preece, pers. obs.). Although most of the coast is rocky, two small sandy beaches (Omakau and Oananga) have dune systems containing *Spinifex*, a native sand binding plant no longer found elsewhere in Tasman Bay (J. Preece, pers. obs.). This stretch of coastline is habitat for the threatened (= IUCN vulnerable) (Bell, 1986) reef heron (*Egretta sacra sacra*) (Walker, 1987). This site is representative of Nelson's north-east coastline (J. Preece, pers. comm.).

The subtidal environment is dominated by boulders, rock headlands, sand and mud bottoms. Algal cover seldom exceeds depths of 6 metres and is dominated by *Carpophyllum flexuosum* and *C. maschalocarpum* on hard substrates. Large pods of bottlenose dolphins (*Tursiops truncatus*) are regularly seen along this coastline (R. Davidson, pers. comm.).

Habitat for reef fish and invertebrates eg. paua (*Haliotis iris*) and crayfish (*Jasus edwardsi*) are common along this coast. However, fishing pressures appear to have significantly reduced populations of many species. Few legal sized pauas have been observed along this coastline (R. Davidson, pers. comm.).

Cultural: Traditionally used, and high landscape/seascape values (J. Preece, pers. obs.).

Historic: Maori occupation of the area was probably the flatter areas of Omakau and Oananga Bays, the coastline being steep cliffs. Midden and ovens have been found from these sites, but there is little published information available.

Site Importance:

National

Of national significance for the presence of the threatened (Bell, 1986) (= IUCN vulnerable) reef heron (*Egretta sacra*), the only Tasman Bay population of *Spinifex sericeus*, and sand binding plant (J. Preece, pers. obs.).

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S 2.2 The area below MHWS has significance because of its proximity to adjacent protected areas. This recognises the importance of the linkages from terrestrial to subtidal habitats. The Whangamoia River mouth to Cape Southerly and the land adjacent to the coast is either marginal strip or part of Mount Richmond Forest Park.

S 2.4(b) Habitat for the threatened (Bell, 1986) (= vulnerable) reef heron (Walker, 1987).

S 2.5 The dune systems are the only Tasman Bay habitat for *spinifex* (J. Preece, pers. obs.). The threatened reef heron is present.

Human Modification and Human Use:

Large portions of the area have been burnt off in the past for grazing. Much of the catchment is now stock-free, with the only real 'development'.

Recreational use of the area is almost non-existent on the coast. Fishing is popular.

Existing Protection:

Much of the coastal strip is protected by a Section 58 (L) strip, now a marginal strip under the Conservation Act. A strip has been allocated to the Department of Conservation. In the northern part, the largest bush areas are within Mount Richmond Forest Park.

Recorded on Existing Databases:

CRI, 1990.

Issues:

Gorse (*Ulex europaeus*), pine (*Pinus radiata*) and nassella tussock (*Stipa trichotoma*) are the three most common weed species. Gorse is not always a problem weed, but can invade some difficult coastal sites, excluding native communities. Similarly, pines have the potential to spread over difficult sites. Nassella is recognised as a major problem weed, and has a strong foothold in open areas, with the main population centred between Omakau and Oananga Bays.

Goats are present throughout and have heavily browsed the native vegetation communities, even on the steep coastal cliffs.

Pigs are present in very high numbers, with the degree of disturbance in some places being sufficient to threaten soil and water conservation values.

Forestry operations on such steep country have potential to damage soil and water conservation values.

Management Recommendations:

The current aim of extermination of nassella should be continued, with careful monitoring to ensure that control operations are having the desired effect.

Pines and gorse need monitoring and control where necessary.

Goat control is essential and is best achieved by a combination of both fencing and shooting. Pig numbers should also be considerably reduced.

Forestry land use consent conditions need to consider not just the usual issues of landscape and sediment, but also the possibility of translocating nassella.

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APPENDIX 1

SCHEDULE 2 (From Draft New Zealand Coastal Policy Statement, 1992)

Criteria for Identifying Areas of Significant Conservation Value

The Minister of Conservation may use one or more of the following criteria in assessing whether an area has significant conservation values:

S2.1 Maori Cultural Values

Areas of local, regional, or national significance identified by the tangata whenua in accordance with tikanga Maori, including waahi tapu, urupa, tauranga waka and mahinga maataitai.

S2.2 Protected Areas

Where there are protected areas below Mean High Water Springs

Any gazetted or notified reserve, marine mammal sanctuary, marine park or other marine protected area, including adequate buffer areas, or any proposal which is under current investigation.

Where there are protected areas above Mean High Water Springs

Where there are protected areas above mean high water springs, consideration may be given to whether the adjoining area below mean high water springs should be identified as an area of significant conservation value.

S2.3 Wetlands, Estuaries and Coastal Lagoons

Any wetland, estuary or coastal lagoon in the coastal marine area which is of national or international importance, including those:

- (a) necessary to act as buffer zones;
- (b) that are important spawning grounds or nurseries for marine and freshwater species;
- (c) where related catchments, marginal land and tidal flats have been minimally modified;
- (d) strategically situated to act as stepping stones for migratory species along coastal tracts.

S2.4 Marine Mammal and Birds

Areas including or near any:

- (a) marine mammal breeding or haul out site;

- (b) habitats of endangered, vulnerable, rare or threatened bird species;
- (c) important roost sites, or feeding areas of wading birds.

S2.5 Ecosystems, Flora and Fauna Habitats

Any area that contains regionally, nationally or internationally significant or threatened ecosystem or plant or animal species.

S2.6 Scenic Sites

Any part of the coastal marine area that forms a land or seascape of national or international importance.

S2.7 Historic Places

Historic places of national or outstanding significance (including archaeological sites adjoining mean high water springs), especially places where the values relate to the seabed as well as to the land.

S2.8 Coastal Landforms and Associated Processes

Representative examples of nationally significant or outstanding coastal landforms and their associated sediment transport systems and sources including:

- (a) Submerged landforms (eg. fiords, drowned river valleys, banks, reefs, moraines and drowned shorelines).
- (b) Erosional landforms including those that have been carved out of the land by the sea (eg. shore platforms and submarine canyons).
- (c) Geologically rare or unusual features of very high quality.

NELSON/MARLBOROUGH CONSERVANCY OCCASIONAL PUBLICATION SERIES

No. 1

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

No. 2

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

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