

COASTAL RESOURCE INVENTORY

FIRST ORDER SURVEY

SOUTHLAND CONSERVANCY

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PREFACE

The Coastal Resource Inventory (CRI) programme is an ongoing project of the Department of Conservation. The programme is organized into First, Second and Third Order Surveys which span the coastal zone of New Zealand. The First Order Survey provides the basis for a national overview of coastal conservation values and is derived from information on the physical, biological and human resources of the coastal zone. The Second Order CRI Surveys will provide regional overviews for each of the Departments Conservancies. Third Order Surveys will provide detailed information at a site specific level for a specific purpose.

The coastal zone covered by the Coastal Resource Inventory is an area bounded by the outer limits of the New Zealand Territorial Sea, 12 nautical miles offshore and the landward limit of marine influence. The latter varies from place to place depending on site specific physical, biological and human factors.

The First Order Coastal Resource Inventory presented here covers the coastal zone of one of the thirteen coastal conservancies of the Department. It is based on existing information compiled by conservancy staff from regional and national databases, published and unpublished reports, limited field surveys and personal or anecdotal information from various experts. The information has been compiled according to guidelines and standards set by the Departments' Coastal Resource Inventory Taskforce.

As one might expect, the First Order Survey has revealed a substantial variation in the quality and quantity of information between Conservancies and also between information categories. In general there is more information about the resources and attributes of the landward part of the coastal zone than the seaward part, especially offshore. Conservancies with large metropolitan centres such as Auckland have more information than the remote coastal areas of New Zealand such as the East Coast. This does not mean that the latter areas are lower in coastal conservation values or resources. Rather, it simply reflects the lack of knowledge and possible directions for further work, so that a balanced national overview of coastal conservation values and resources is eventually obtained.

The First Order CRI provides essential information for managers, planners and users of the coastal zone of New Zealand. The national overview provided by the First Order Survey will be updated from time to time by the Department as new information comes to hand.



Bill Mansfield
DIRECTOR GENERAL
DEPARTMENT OF CONSERVATION

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NATIONAL OVERVIEW

INTRODUCTION

The Coastal Resource Inventory (CRI) programme was initiated in 1987 as the Department of Conservation's principal tool for breaking the cycle of reactive management that has characterised coastal management in New Zealand in the past. CRI provides important information on the physical, biological, recreational, cultural, historic, archaeological, human modification, uses, protection and threats to the coast.

The First Order Survey consists of thirteen volumes, one from each coastal conservancy (Northland, Auckland, Waikato, Bay of Plenty, East Coast, Hawke's Bay, Wanganui, Wellington, Nelson/Marlborough, Canterbury, West Coast, Otago, Southland). Each volume includes a brief description of the conservancies' coastal zone, a summary of the conservation values, a list of issues of concern and recommendations for further work. The information is described on site sheets and plotted on maps at a scale of 1:250 000 to give a broad, overall impression of the coastal conservation values within each conservancy.

In addition to its primary use for coastal management, First Order CRI information will help identify areas suitable for marine reserves and aid in the advocacy role of the Department at both the national and conservancy level.

Mission Statement:

The primary mission of the First Order Survey was:

"To provide information for the maintenance, enhancement and restoration of natural character and qualities of coasts and their sensitive use."

The following specific tasks were developed to achieve the mission:

1. *"To identify coasts with important natural, scientific, historic, cultural and spiritual values;*
2. *to identify coasts currently protected and warranting protection;*
3. *to identify coastal conservation values susceptible to existing and potential threats;*
4. *to identify human modification and uses of coasts".*

INSTRUCTIONS FOR USE OF THE COASTAL RESOURCE INVENTORY

This folder consists of an introduction, summary, site record forms, and maps. The site record form gives written information on each site and is to be used with corresponding maps for that site.

Read the site record form with its corresponding maps by following these steps:

SITE RECORD FORMS

1. Turn to the site record forms.
2. Find the site number in the top right-hand corner of the page e.g. CRI 01 0001. The number 01 represents a conservancy coastline. Refer to map of New Zealand below e.g. 01= Northland Conservancy. The number 0001 refers to a particular site e.g. Firth of Thames.
3. Each site record form gives written information on the following:

natural values cultural values historic values	}	site of conservation value
existing threats human use and modification existing protection		
4. Letter codes (a,b,c,d,e,f,g) give detail for each part of the information on the site record form. A key is provided on the maps and the codes are listed in the "Methods" section.

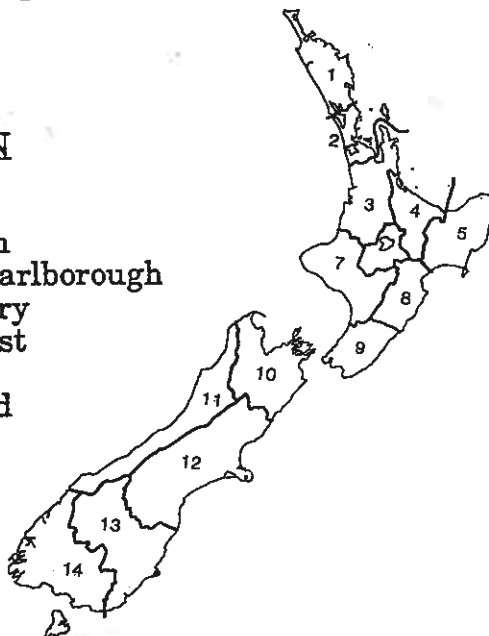
MAPS

5. Turn to the map index overleaf. The index gives the site number and its corresponding maps.
6. Find the corresponding maps in the second part of the folder.
7. Accompanying the maps are two transparent map overlays:
 - i) CONSERVATION VALUES overlay
 - ii) BASE MAP overlay
8. The BASE MAP and CONSERVATION VALUES overlays are designed to lift out and overlay onto each of the previous pages (i.e. natural, cultural, historic, human modification and use, existing threats, existing protection etc.)
9. To accurately overlay the base map with each page, use register marks which are found on each map.

i.e.  overlays on 

DEPARTMENT OF CONSERVATION COASTAL CONSERVANCIES

- | | |
|------------------|------------------------|
| 1. Northland | 8. Wellington |
| 2. Auckland | 9. Nelson/ Marlborough |
| 3. Waikato | 10. Canterbury |
| 4. Bay of Plenty | 11. West Coast |
| 5. East Coast | 12. Otago |
| 6. Hawkes Bay | 13. Southland |
| 7. Wanganui | |



MAP INDEX - SOUTHLAND

Site No.	Map Grp.	Site No.	Map Grp.
0001	17.1	0043	16.3
0002	17.1	0044	16.3
0003	17.1	0045	16.3
0004	17.1	0046	16.2
0005	17.1	0047	16.2
0006	17.1	0048	16.2
0007	17.1	0049	16.2
0008	17.1	0050	16.2
0009	17.1	0051	16.1
0010	16.4	0052	16.1
0011	16.4	0053	16.1
0012	16.4	0054	16.1
0013	16.4	0055	16.1
0014	16.4	0056	16.1
0015	16.4	0057	16.1
0016	16.4	0058	16.1
0017	16.4	0059	14.2
0018	16.4	0060	14.2
0019	16.4	0061	14.2
0020	16.4	0062	14.2
0021	16.4	0063	14.2
0022	18.2	0064	14.2
0023	18.2	0065	14.1
0024	18.2	0066	14.1
0025	18.2	0067	14.1
0026	18.2	0068	14.1
0027	18.2	0069	14.1
0028	18.2	0070	14.1
0029	18.2	0071	14.1
0030	18.2		
0031	18.1		
0032	18.1		
0033	18.1		
0034	18.1		
0035	18.1		
0036	18.1		
0037	18.1		
0038	16.3		
0039	16.3		
0040	16.3		
0041	16.3		
0042	16.3		

METHODS

The information for the First Order Survey has been collated and mapped in six major categories: natural, historic, cultural, existing threats, human modification and use, and existing protection.

1. Natural Values:

Information on known areas of physical, biological and ecological value in the coastal zone under the following headings:

- a - High degree of naturalness
- b - Rare/unique species, communities or habitats
- c - Important breeding/feeding/roosting/haulout/nursery areas
- d - Fragile/environmentally sensitive areas
- e - Unique or unusual landforms
- f - Representativeness
- g - Known scientific value
- h - National or international importance
- i - Other

2. Cultural Values:

Areas of important Maori and non-Maori cultural values in the coastal zone under the following headings:

- a - Traditional values
- b - Aesthetic value
- c - Landscape (seascape) value
- d - Spiritual value
- e - Educational value
- f - Other

3. Historic Values:

Areas of important historic and archaeological value in the coastal zone under the following headings:

- a - Known historic value
- b - Archaeological value - Maori origin
- c - Archaeological value - Non-Maori origin
- d - Shipwrecks and wreck sites
- e - Known national or international significance
- f - Other

Explanatory Notes

- (i) The decision to include the attributes "high degree of naturalness", "representativeness", aesthetic value", "land/seascape value" and "spiritual" value was based on the experience of the data recorder.

The Natural, Cultural and Historic categories of information were combined to form the Conservation Value overlay map, where all features of natural, historic or cultural value were overlaid then amalgamated to form sites of conservation value (Conservation Sites). For each of these sites a brief description was provided on the Site Record Form. The Site Record Form contains details of the conservation values mapped and includes the following three other categories (4-6) that impact on these values:

4. Existing Threats:

Threats may be natural or human induced activities that are or have a history of damage or destruction of the coastal resources. Information on the following was collated and mapped:

- a - Erosion, flooding, landslip
- b - Siltation
- c - Noxious and invasive exotic plants
- d - Noxious or farmed animals
- e - Water pollution
- f - Mining
- g - Shore stabilisation works
- h - Aquaculture
- i - Fishing techniques
- j - Spoil and refuse dumping
- k - Recreation
- l - Coastal subdivision
- i - Other

Explanatory Notes

- (ii) The inclusion of "recreation", "mining", "aquaculture" and "fishing techniques" in the "Existing Threats" category was only used where these activities threatened conservation values. It is acknowledged that there are many places where these activities do not pose a threat.

5. Human Modification and Use:

Information on the following was collated and mapped:

- a - Land development
- b - Reclamations and causeways
- c - Commercial port areas
- d - Small boat harbours and moorings
- e - Outfalls, major pipelines and cables
- f - Artificial cuts
- g - Beach replenishment
- h - Shoreland-based recreation
- i - Water-based recreation
- j - Traditional Maori use
- k - Other

6. Existing Protection:

Areas of varying protection status in the coastal zone were mapped, including:

- a - National protected areas
- b - Regional protected areas
- c - Local protected areas
- d - Protective zonings
- e - Marine parks
- f - Private protected areas
- g - Voluntary protection of areas
- h - Rahui
- i - Other

Evaluating Site Importance

Evaluation of site importance was largely species based using the following criteria: The criteria for fauna (Bell, 1986) and flora (Given et al, 1987 and Wilson and Given 1989) are based on the IUCN Red Data list.

1. If a species of plant or animal is listed as endangered and it is an endemic species, then the place(s) where this plant or animal still remain are of INTERNATIONAL importance.
2. If a species of plant is vulnerable or rare, then the site where it naturally occurs is of NATIONAL importance. Similarly if a species of animal is classified as threatened or rare then the site is of NATIONAL importance.
3. For a species of animal that is classified as threatened regionally only, the site has regional importance.
4. Where sufficient information allowed the Ramsar convention was used to determine site importance in Wellington, East Coast and Bay of Plenty. The Ramsar convention states; *"a site is of international importance if 1% of the total*

population of a species or subspecies is found there or if the area supports 1% of breeding pairs".

5. Other information on site importance from the historic or cultural categories which is documented in the literature was also used.
6. The highest level of importance for any category located within a site is given to the whole site.

Explanatory Notes

(iii) The site importance is not a ranking system for the sites. It merely indicates whether there is a feature present at the site which is of known importance. The Conservation Sites identified in the First Order Survey vary considerably in size and importance.

(iv) Wildlife which have an established international conservation status in New Zealand include the terrestrial mammals, birds, reptiles and amphibians and terrestrial arthropods and molluscs. There is no established status list for fish, marine invertebrates and marine mammals. This means that the assessment of comparative site importance in this survey has an unavoidable bias towards the importance of terrestrial wildlife.

(v) Archaeological site information was presented here without comment on its comparative importance. This was necessary because:

(a) authority to assess archaeological site importance under the Historic Places Act 1980 rests with the New Zealand Historic Places Trust, for the purpose of regulating site damage.

(b) No methodology is recognised for assessing comparative importance in a similar manner applied to the other resources described here.

GLOSSARY

archaeological site	Any place in New Zealand associated with human activity which occurred more than 100 years before that time.
historic place	A place which is associated with the past. This includes archaeological sites, traditional sites, buildings, natural objects and historic areas.
holostratotype	A geological term describing the type section that has become the time definition for a New Zealand stage.
tombolo	A bar connecting an island with the mainland or with another island.
type locality	The place where a geological formation is named, and is typically displayed.
ventifact	Rock cut by wind-blown sand.

BIOLOGICAL TERMS:

endangered	Species in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are those whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are considered to be in immediate danger of extinction.
threatened/ vulnerable	Species believed to likely to move into the endangered category in the near future if the causal factors continue operating.
regionally threatened	Where species are considered to be threatened regionally.
rare	Species with small world populations that are not at present endangered or vulnerable, but are at risk. These are usually localised within restricted geographic areas or habitats or are thinly scattered over a more extensive range.
indeterminate	This category is used for plants thought to be extinct, endangered, vulnerable or rare, but for which there is insufficient information to allow allocation to a category.

In New Zealand a category additional to those used by IUCN (International Union for the Conservation of Nature and Natural Resources) has been found useful:

local	This category includes plants not under threat but potentially threatened, and hence deserving some level of monitoring and possibly protection. Included are regional endemics, plants of potentially vulnerable habitats, and species occurring as frequent but small populations.
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endemic	A species which is confined to New Zealand and is not found elsewhere.
endemic subspecies	A subspecies or geographic race which is confined to New Zealand.
introduced	A species which has been transported to New Zealand, and helped establish by humans.

MAORI**ENGLISH**

hāngi	earth oven
hapū	section of large tribe, clan, subtribe
iwi	nation, people; tribe that traces its history back to a common ancestor
kai moana	food from the sea
kāinga	dwelling place, village
kaitiaki	guardian, keeper
Kaumātua	adult, old man or woman
kōhatu/ toka	stone, rock
mātaitai	food resources from the sea
mahinga mātaitai	the areas from which these resources are gathered
mahinga kai	sites for harvesting kai moana according to tribal customary values
mana	authority, control; influence, prestige, power; psychic force
mana whenua	customary authority exercised by a tribe in an identified area
marae	enclosed space in front of a meeting house, courtyard
mauri	life principle which is latent in all things
midden	Māori shell deposits
moana	sea
Moriori	tangata whenua of Rēkohu (Chatham Islands)
pā	fortified place
rāhui	control/ restriction (e.g. fishing control)
rūnanga	assembly/ council
taiāpure	area of coastal water set aside under the Maori Fisheries Act 1989 as a local fishery because of its special significance to an iwi or hapū, either as a source of food or for spiritual or cultural reasons
Tangaroa	god of the sea
Tangata whenua	indigenous people
tapu	sacred, forbidden (tapu consists of different levels of prohibitions)
tauranga waka	original canoe landing site
tupuna/ tipuna	ancestor/ grandparent
urupā	burial place
wāhi tapu	sacred site
waka	canoe; supra-tribal grouping
whānau	family

1. INTRODUCTION

This publication comprises a series of maps (at a scale of 1:250000) and site record sheets which describe sites of known coastal conservation value, within the conservancy. It also includes a summary of these values and highlights outstanding areas.

The aim of this first order CRI exercise was to provide a national overview of the conservation status of New Zealand's coastline to meet the anticipated requirements of the Resource Management Act 1990. As such it is an overview of what is now known (at August, 1990) about coastal areas of conservation value. Natural, cultural and historic values of each site are described.

Additionally existing threats to the coast, human modifications and uses, and existing protection types within the coastal zone have been mapped and described.

This exercise has been based on existing knowledge and on field work that had already been carried out; much of the information included has come from department staff, both present and past, and from internal reports. Because of the limited time in which it was compiled, it was not possible to obtain all existing references from outside the department that may have been relevant; this particularly applies to marine (as opposed to coastal land) areas.

Much of the conservancy's coastline is of high conservation value. Outstanding areas are highlighted in this summary in sections 4 and 5. Reference should also be made to the individual site record sheets. The manner in which the limits of individual sites were chosen does not relate solely to ecological similarities or representativeness as it was also based on land use and tenure, and degree of modification.

2. THE CONSERVANCY'S COASTLINE

Within the Southland Conservancy are the shores of Fiordland, Southland and Stewart Island, and also several groups of islands and stacks which occur in Foveaux Strait and around Stewart Island. These coasts are influenced at times by both cold Subantarctic waters and by the warmer mixed waters of the Southland Current. The area has floral and faunal affinities with the Subantarctics. The climate is cool temperate and frequently cloudy and wet. The highest rainfall occurs in the west, up to 8000mm p.a, the lowest along the Southland coast (800mm).

The Southland coast has been classified as a Forsterian province (biogeographically) and as being the Southern Neritic Territory (a N.Z. representative ecological area)(Morton and Miller 1968; King et al 1985).

3. SUMMARY STATISTICS OF CRI COVERAGE.

The length of the Southland Conservancy's coastline has been calculated as 3000 km. using 1:50000 or 1:63360 scale maps; this is based on an estimate of 2760 plus 20% to allow for indentations and islands not measured.

There are 73 sites identified on the Southland coast.

All of the Southland coast including those areas out to the 12 mile limit were considered to have some conservation value and therefore 100% of the Conservancy coastline is included in sites.

The Subantarctic Island groups were not included in the first order survey, although part of Southland Conservancy. A collation of existing information is required for these islands.

Very little of the Southland coast is covered by detailed field CRI checks with the exception of Paterson Inlet, Port Pegasus, Port Adventure (Stewart Island) and Te Awaatu channel (Doubtful Sound). This is a total percentage of 7.5%.

Other field checks have been carried out in various areas for specific purposes:

- much of Fiordland has been field checked in the past (pre DOC) for coastal historic/archaeological sites including Preservation Inlet, Chalky Inlet, Dusky Sound, George Sound, the area from West Cape to Cape Providence, Bligh Sound, Martins Bay, Poison Bay to Transit Beach and Milford Sound to Kaipō River.
- most islands in the conservancy have had botanical and bird species checks carried out in the past.
- more recent (DOC) field checks for natural values have been carried out in Bluff/Omaui, Centre Island, northern Titi Islands, Ulva Island, areas of the south east and south west coasts of Stewart Island, Masons Bay, Codfish Island, Big and Little Hellfire, Doughboy and East and West Ruggedy.

All sites are covered by references i.e. 100% of the Southland coast. However almost all references are of a general nature only. Shelf sites with almost no information include Eastern Foveaux, Catlins coastal, Eastern Stewart Island, Snares, Western Stewart Island, Western Foveaux and Breaksea to Fannin Bay (outer coast).

Much of the Southland coast remains in a largely unmodified state with a large proportion of Stewart Island and all of the Fiordland coast being backed by reserve land or DOC stewardship land.

Table 1: The number of sites within the Southland Conservancy contained within each importance category, the approximate length of the coastline each category covers and the relative proportion each category constitutes of the whole coastline.

Importance	Number of Sites	Approx. length (Km)	% of Coast
International	30	2127	70.9
National	24	735	24.1
Regional	11	135	4.5
Local	00	0	00.0
Unknown	08	15	0.5*
Total	73	3000	100.00

* Most of the sites with unknown importance cover extensive areas of shelf rather than just coastline.

4. SUMMARY OF COASTAL CONSERVATION VALUES

4.1 Big Bay / Martins Bay CRI sites 140070 and 140071

North of the fiords are two large embayments Big Bay and Martins Bay, the most northern coastlines in the conservancy.

This is a remote and highly natural area with high coastal conservation values.

The dunes at both Big Bay and Martins Bay support rare native dune vegetation such as pingao (*Desmoschoenus spiralis*), sand spurge (*Euphorbia glauca*) and *Myriophyllum robustum* (Johnson 1979).

Waiuna lagoon behind the northern end of Big Bay is an extensive wetland and haven for a large number of waterfowl including the endangered brown teal (Coker and Imboden 1988).

Kotuku (Martins Bay) was once a large Maori settlement. Both Martins and Big Bay were well-known as greenstone sources (Hall Jones 1988).

Martins Bay lies at the northern boundary of Fiordland National Park; stewardship land extends north from here to conservancy boundary. Freehold sections are scattered along the Hollyford River and at Big Bay.

Whitebaiting is a traditional activity at Awarua River. The principal threats to this coast are from introduced animals, particularly deer and rabbits, and from weed species. Marram, gorse and lupin threaten to displace native dune species on these vulnerable sites (Johnson 1979).

Along the seacoast both crayfishing and paua diving occur but little is known about their effects on the marine ecosystems here.

4.2 Fiordland CRI sites 140047 and 140071

The far west of Fiordland is one of the few regions remaining in New Zealand that is virtually untouched by human influence. As an ecosystem, as a landscape, and as a geological block, Fiordland is quite different from the rest of New Zealand (Lands and Survey, 1986).

There are thirteen fiords, the basin of each separated from the wild, rugged outer coast by a shallower sill of rock moraine. The sheer walls extend to considerable depths (Stanton and Pickard 1981).

In Fiordland the high rainfall, the forested catchment and topography have combined to create an underwater world which is both unique and of international scientific interest (Grange 1990). Much of the biological uniqueness of the fiords is caused by the freshwater layer which allows usually deep-water or light avoiding species to become established in shallow waters. The small temperature range permits the establishment of sub-tropical species.

In contrast to the sparse intertidal life, below five metres depth, the rock walls support an extreme diversity of life. Several species that are either very rare, or elsewhere live in much deeper habitats, dominate the subtidal rock walls. Brachiopods and black coral (*Antipathes fiordensis*), both recognised by IUCN convention dominate the associations accompanied by crinoids, sponges, bryozoa, tubeworms and diverse coelenterate species. There are an estimated 7.5 million black coral colonies in Fiordland. Animals common in the fiords, but only found in very deep water elsewhere include the saucer sponge, a large tube anemone and two sea pen species.

Of the approximately 60 fish species living in the top 45m of the fiord waters there are subtropical species, eg splendid perch, cool temperate species, eg blue cod, and because the edge of the continental shelf is close inshore, deep water fish species, eg orange lined perch (*Lepidoperca sp.*) (Grange 1990).

The small islands in the southern fiords which are an important breeding area for species like mottled petrels, broad-billed prions and sooty shearwaters. Fiordland crested penguins and southern blue penguins also breed right along this extensive coastline, as do NZ fur seals. In Fiordland the fur seal breeding population has been estimated at 9000 (Wilson G.T. 1981).

Leopard seals and southern elephant seals are rarer visitors to the outer beaches and fiords. Pods of bottle-nosed dolphins are common both along the coast and in the fiords; common and dusky dolphins less so. Small schools of killer whales are seen offshore, also southern right whales, humpback and sperm whales.

The dunes at several outer bays contain relatively unmodified native dune vegetation including an abundance of pingao and in places other rare species such as *Euphorbia glauca*. The dune forests of Poison Bay, Coal River Beach and Transit Beach may well be the last dune forests in New Zealand unaltered by browsing animals (Johnson 1979).

The river mouths are important feeding areas for waterfowl and waders such as the rare blue duck which are widespread and relatively common in many areas. Fiordland is also a remaining stronghold for the endangered brown teal, South Island kaka (regionally rare), South Island brown kiwi, and New Zealand falcon (both threatened) (Kim Morrison pers. comm.)

Banded kokopu, koaro and inanga are common in some of the rivers near the coast; in slow-flowing streams and swampy areas is the rare galaxiad, the giant kokopu. The introduced brown trout are present only in some of the western rivers - Transit, Poison Bay and the George, Wild Natives and Seaforth Rivers.

The Fiordland coastline is of high cultural importance because of its land and seascapes, its scenic qualities, and its spiritual values.

The Maori history of Fiordland reaches back into legend to Tu-te-Rakiwhanoa, a demigod by whose massive exertions the fiords were chopped out of a previously unbroken mountain wall (Beattie 1949).

For the Maori the main attractions of Fiordland were takiwai (greenstone), the seals and birds.

The Fiordland coast is also rich in European archaeological sites and events e.g. Captain Cooks' early visits to the fiords. The historical remains of human endeavours such as sealing, sawmilling, gold prospecting and mining are still visible in many of the southern fiords.

Fiordland is unique in mainland New Zealand in that it has barely been affected by agriculture, fire or weeds.

Outside the archaeological sites there is little evidence of human impact on Fiordland. Public road access is limited to Milford Sound. The only freehold enclave within the park boundaries is at Cromarty in Preservation Inlet.

The prime threats to this highly natural coastline are not to the land which is protected, but to the sea. Depletions of rock lobster stocks inside the fiords has meant that commercial fishing for rock lobster is now restricted to the entrances of the fiords and the outer coast. It is likely that the very small area of habitat within the fiords has never supported large numbers of either fish or crayfish (Grange 1990). The sustainability of these fisheries (commercially and recreationally) within the fiords has never been assessed, but there is local concern over stock depletion especially within the more accessible fiords.

Along the outer Fiordland coast deer have removed the protective native scrub allowing the sandy beaches to encroach further inland into the forest. Weeds threaten primarily the beach and dune areas. Fiordland has some of New Zealand's remaining dune areas with intact vegetation sequences e.g. at Coal River.

All of the Fiordland coast has outstanding natural, cultural and particularly in the south, historic conservation values.

4.3 Waitutu / Wairaurahiri CRI sites 140043 and 140044

East of Fiordland and west of Te Wae Wae Bay is the coastline of the Waitutu/Wairaurahiri an area geomorphologically unique in the conservancy. From the shore rises a remarkable series of marine terraces; each represents an ancient gently sloping shore platform and the shallow seaflow beyond which has subsequently been uplifted by tectonic earth movements. Along the coast, the youngest terraces are still being formed as the waves wear back the soft, sedimentary cliffs, leaving a broad intertidal platform which in many parts extends hundreds of metres offshore.

Active coastal retreat appears to be occurring; the soft mudstone and siltstone cliffs are eroding and as they retreat the forest is exposed to saline winds and dies back; coastal shrublands then develop.

Pingao (a rare sand sedge) grows on dunes found at the mouths of some of the rivers in this area and at Sandhill Point, a large dune complex.

Waitutu is the most extensive area remaining in Southland of lowland pure podocarp and inland podocarp - beech forest.

Maori archaeological sites such as the middens around the river mouths, are scattered along the coast. Such points were probably used as stopovers during expeditions by the Foveaux Strait Maoris, by canoe along the coast and to the fiords (Beattie 1949).

The track system from Te WaeWae to Big River is well used by trampers and hunters.

Deer, pigs and possums are an increasing threat to the coastal forest -they reduce the protective nature of the marginal scrub (Johnson 1979).

The potential logging of the podocarp forests has been of great national concern in recent years. Whilst the former Waitutu State Forest is now stewardship land allocated to DOC, there are still extensive tracts of Maori land along the coast. Negotiations are presently continuing to save this land from logging.

The widespread concern about the depletion of paua stocks in Southland extends to this area. Crayfishing also occurs along the coast.

The coastline is of high conservation value, particularly because of its natural and historic attributes.

4.4 Southland - Te Waewae to Waikawa CRI sites 14001 - 140014, 140016, 140018, 140041 & 140042.

The Southland coastline is 439 km long and of varied form; almost all is of Quaternary origin.

In the west is the large embayment of Te Wae Wae, 22km long; the beach here consists of a range of soft shore types. The Waiau River which enters the sea mid-bay once had the largest catchment of all Southland rivers, but the Manapouri Power scheme and Mararoa weir have so reduced it, the flow is sometimes not sufficient to keep the mouth open. The Waiau lagoon at the river mouth is used by several waterfowl and other species (Cooper 1989).

Between New River and the Maituna is a large area of ancient marine benches, alluvial flats caused by stream aggradation and extensive peat bogs. Waituna Lagoon, and its surrounding wetlands and peat bogs is the largest most natural area remaining along the Southland coast.

Between Fortrose, Pahia and Riverton the rocky shore here is volcanic origin, the pillow lavas forming interesting formations and a variety of microhabitats. Offshore small inlets offer seabirds roosting and breeding habitat.

Jurassic sediments, rich in plant remains, occur along the coast in the Slope Point area and around Curio Bay/Flaxy Head where there is an impressive fossil forest (160 million years old) exposed on the shore platform (Lindquist J. 1988).

Along this southern coastline almost all the backshore has been developed principally for farming; marram and introduced grasses have largely replaced native coastal plants. Only near Omaui and at Fortrose spit is pingao still common over large areas.

An important feature of the Southland coast is formed by the complex of Southland estuaries. Jacobs river, New River, Awarua Bay, Waituna Lagoon and Toetoes estuary

are used extensively by waterfowl and waders including several species of transequitorial migrant waders such as the far-eastern curlew, siberian tattler and sanderling (Cooper 1989).

Several of these estuaries are also of extremely high value as fish nurseries and habitat: Toetoes Bay (which supports whitebait and brown trout fisheries of national importance), Waituna Lagoon, New River, Jacobs River and Lake George (Wetlands of National Importance to Fisheries Database, MAFFish).

At Three Sisters pingao is abundant; also present is one of the worlds rarest plants *Gunnera hamiltonii*. It is known in the wild only from here and three Stewart Island locations. Large ventifacts, and moa bones are also found at Three Sisters.

Along parts of Oreti and Te WaeWae Beach there are populations of toheroa, a large uncommon shellfish.

The most distinctive botanical features remaining on Southland coastline are the lowland coastal peatlands of Waituna (now recognised as a wetland of international importance under the Ramsaar Convention), the tussocklands and shrublands of Tiwai Peninsula, the herb moor of Ocean Beach and Bluff hill and the *Brachyglottis* scrub of this rocky coastline.

Yellow eyed penguins are known to nest in several locations, principally in the Blueskin Bay - Waikawa area in the east.

The history of the Southland coastline is rich and varied. Much of the early European activity has been documented by John Hall-Jones, but little is known of early Maori life. Along the shores of Foveaux Strait, settlements of Murihiku Maoris were widespread. Kaikas (villages) are known to have been located at Pahia, Oraka, Old Man's Bluff, Jacobs River estuary, in the dunes near Sandy Point, Omaui, Ocean Beach and Toetoes (Fortrose area). However these were probably not all occupied over the same periods.

Some areas of the coast are known to be of spiritual value to the Maori - for instance Omaui, where Maui stood to pull Stewart Island, the anchor for the canoe of Aoraki from the sea. For others such as Monkey Island, the reason for the areas value is unknown.

Other areas of cultural significance in Southland include Sandy Point, Bluff Harbour, Tiwai Point and Greenhills, Porpoise Bay, Waikawa and Dog Island (Williams, 1983).

The greatest continuing threats to the coast are twofold. Firstly is the continuing damage to estuaries through siltation, water pollution, drainage and reclamations, and the spread of *Spartina* (which accelerates siltation and blocks waterways).

New River Estuary is most at risk, because of the presence of Invercargill on its northern shores. Pollution from the city tip where land is being reclaimed by rubbish dumping, from the city's sewage treatment plant discharge, a wool scour and other such point

sources is an ongoing concern to DOC and the Southland Regional Council. *Spartina* is most widespread in this estuary, but also present in Jacobs River estuary, Bluff and Haldane. Although a major commercial port area is sited in the harbour, Bluff does not have a history of large scale reclamations. The estuaries are vulnerable to upstream effects such as forest clearance which effects siltation patterns.

The second threat to Southland shores is the depletion of species because of fishing - both commercial and recreational. Of prime concern are paua also mussel stocks the latter particularly in the Riverton - Pahia area. Because of local concern there is currently in place a total closure of all shellfish beds for two years in the Riverton area.

Little of the Southland coast is protected - few of the small reserves near to the coast extend down to mean high water; the Waituna/Seaward Moss/Tiwai area is the only one in which reserves or stewardship land cover extensive areas down to the shore. Paper roads offer nominal protection in places but as these are usually grazed down to the shore, they afford little protection particularly to vulnerable coastal turf communities as at Waipapa Beach.

4.5 Stewart Island CRI sites 140019 & 140019A, 140022 - 140027, 140029, 140031, 140032, 140034, 140035, 140037 - 140040

Like Fiordland, Stewart Island is one of the largest areas of unmodified coastline and of marine habitats in New Zealand. But unlike Fiordland, the Island derives much of its specialness from being an island with a southern oceanic character.

Its marine climate is strongly influenced by the Southland Current which arises to the southwest. Stewart Island waters are derived mainly from the Subtropical Convergence with some a mixture of subantarctic waters; this mixing has produced a distinct southern marine flora and fauna. (Heath, 1975)

Stewart Island represents probably one of the largest areas of unmodified (inshore) marine habitats in New Zealand (Grange and McKnight, 1987). Stewart Island's coastline, some 700km, is diverse, as well as natural.

The diversity of marine algae species highlights the richness of the marine life - of a total of 835 species in the NZ botanical area (which includes the subantarctic islands) almost half (379) occur around Stewart Island (Parsons, 1985).

On the soft sediment bottoms of Paterson Inlet and Port Pegasus there are several assemblages that have been recognised as unusual in scientific papers.

A marine reserve proposal has been floated for Paterson Inlet but is still at an initial discussion phase.

Stewart Island's vegetation has affinities both to the subantarctic and to more northerly New Zealand (NZFS et al, 1978)

The coastline is also an important breeding area for many seabirds and a wide variety of shorebirds. Petrels, penguins and shags breed on the smaller islands.

Many of Stewart Islands bird species no longer occur on mainland New Zealand or are found infrequently. Species of particular note include NZ dotterel which feed on sandy beaches (and breed on the tops), banded dotterel which both feed and breed on beaches particularly along the western coast, and yellow-eyed penguins which are widespread around much of the island.

Along the coastline New Zealand fur seals are common, their breeding sites are mostly on the main offshore islands. The rare Hookers sealion visits much of the coastline, and the northernmost breeding colony of this species is located at Ernest Island off Port Pegasus.

Outstanding landscape areas include Port Pegasus, Mason Bay, Big Hellfire, Doughboy Bay, the Ruggedy Mountains and Port Adventure (NZFS et al 1978; Meurk and Wilson 1989).

The oldest name for Stewart Island is Te Punga o te Waka a Maui, the anchor of Maui's canoe. When the great navigator Maui reached Omaui on his circumnavigation of the canoe of Aoraki, he paused to pull up an anchor for that canoe. The Maoris also gave the island the most beautiful of its names -Rakiura, The Island of the Glowing Sky.

In the age that followed the Waitaha people occupied the south in great numbers and the coastal areas where food was plentiful -paua, mussels, birds and fish, were extensively used by these Maoris. In later years Ngatimamoe also made use of Rakiura (Howard 1974).

Present knowledge of the location of pre-European sites is incomplete and all the coastline, extending at least 1.3 km inland is potentially of archaeological importance. Recent surveys of the southern inlets located many previously unrecorded sites (Cave 1980).

European activities were largely centred around the coastline of the inlets - Paterson Inlet, Port Adventure and Port Pegasus. The first settlers were from early whaling and sealing ships in the late 1700's/early 1800's. Fortunately, a later sawmilling industry ceased in 1931 before much of the island had been touched (Howard 1974).

The most lasting impact of humans has been the introduction of mammals - rats, the kiore, Norway and ship rats, red and virginian deer, possums and cats in particular.

Along the coast deer and possums have significantly weakened the forest structure; contributing to "coastal dieback" and the subsequent retreat of the forest margin.

Cats and rats have led to the decline of many native bird species, small invertebrates and insects. This effect is best illustrated by the bird species that have survived by being

transferred to islands on which kiore are not present, such as the South Island saddlebacks on Putahinau.

Weed species are a threat to open coastal areas - sand dunes in particular. Marram, the most serious threat, is present on almost all the dunes now, though of the spectacular west coast systems it is widespread only at Mason and Doughboy Bay.

The most recent threats to Stewart Island have been to the sea. Commercial fishing is widespread around the island, particularly crayfish, and paua diving. Concerns have been raised that since the introduction of quotas for paua, stocks of this species around Stewart Island have been decimated.

Since 1980, salmon farms have been operating in Big Glory Bay in Paterson Inlet. The adverse effects of these farms on the environment have been monitored. Recent calls by the industry and MAFFish to extend the areas available for aquaculture in Southland including Stewart Island, prompted a study of the effects of marine farming and the options available for expansion (Southland United Council, 1989; Roper et al 1988).

Much of the land area (around 98%) of Stewart Island is protected either as reserves or as DOC stewardship land. Other land is primarily Maori land or Maori reserve protected from land clearance under the Stewart Island district scheme. Marginal strips fronting Maori land are subject to a Treaty of Waitangi claim.

All Stewart Island's coastline has outstanding coastal conservation values.

4.6 Island Groups CRI sites 140017, 140020, 140021, 140033 & 140046

Within the conservancy, are several groups of islands, almost all of high ecological value. Many of these islands are sanctuaries where native flora and fauna are protected from human modification, partly by statute, partly because of their isolation and limited use.

They are protected habitats for species of sea birds, land birds, bats, insects and plants rare or extinct on the mainland such as kakapo (on Codfish Island), short-tailed bats and Cooks scurvy grass. These islands also provide a haven for N.Z. fur seals, and yellow-eyed penguins.

Muttonbirds are harvested annually from the Titi Islands. There are very strong traditional and spiritual values associated with this harvest which has occurred for many generations and is unique in New Zealand. Some islands around Ruapuke are also birded.

Ruapuke Island has a rich Maori and European history; it has long been a central area for the gathering of Murihiki (Southland) Maoris, and a base for southern chiefs including Tahawaiki, who became paramount chief of the South Island in the 1840's.

Of all the islands, only Centre and Pig Island in northern Foveaux Strait and Ruapuke Island in the east have been heavily modified.

The biggest threat to the island groups is the introduction of further predators, such as cats and rats, particularly to those islands that still remain predator free.

Little is known of the intertidal and subtidal communities of these islands. Almost all the islands have been heavily dived for paua, and fished for rock lobster. The depletion of paua is of concern to local divers and to MAFfish who suspect that the remaining stocks are insufficient to repopulate the rocky shores.

Much of Ruapuke is closed to commercial fishing for pauas and for Bluff oysters; the latter because the area is closed for research purposes. But still the local owners are concerned about the depletion of kaimoana.

Almost all these islands have very high natural values; even those modified are of important value as habitats and breeding areas for bird species such as southern blue penguins.

4.7 Continental Shelf Areas CRI sites 140015, 140028, 140030, 140036, 140045, & 140072

The most extensive areas of continental shelf area in the south are firstly Foveaux Strait and its eastern and western extremities and secondly the Snares shelf, most of which is outside the 12 mile limit. Shelf areas also extend to the east and west of Stewart Island. The shelf is narrow off the Fiordland coast, typically less than 5 km.

Shell beds are widespread in the strait; extensive beds of Bluff oysters *Ostrea lutaria* form the basis of a long established fishery. Several brachiopod species are also present.

There has been strong concern in recent months about the sustainability of the present allowable catches of oysters; since the advent of a parasite bonamia in the beds, there has been a large decline in the numbers of live shellfish being recovered.

These shelf areas are important feeding areas for seabirds, including penguins and marine mammals. One of the primary threats to these species is the large quantity of rubbish disposed of at sea. Plastics especially, are well known to harm marine wildlife where ingestion and entanglement occurs.

The effects of widespread fishing on food chains, in turn affecting seabirds and mammal populations is of particular concern.

4.8 Site Importance Summary

Sites of International Importance:

Porpoise Bay / Curio Bay CRI 140002: Petrified forest (ref. 59).
 Waituna/Seaward Moss/Awarua CRI 140007: Ramsaar listing for Waituna; outstanding waterfowl habitat (ref. WERI).
 Paterson Inlet CRI 140022: Free-lying brachiopods (ref. 87).
 Codfish Island CRI 140039: Endangered kakapo refuge (ref. 9).
 Solander Islands CRI 140046: Part of a World Heritage Site (ref. 28).
 South Coast CRI 140047: Part of a World Heritage Site (ref. 28).
 Sealers Creek / Puysegur CRI 140048: Part of a World Heritage Site (ref. 28).
 Preservation Inlet to Big Bay (including all the fiords) Sites CRI 140049 - CRI 140071: This area is all part of a World Heritage Site (ref. 28).
 Northern Titi Islands. CRI 140020. Endangered South Island Saddleback (ref. 114).
 Ruapuke Island. CRI 140021. Rare plant punui and Pingao and yellow-eyed penguin breeding sites (ref. 9, 114).
 Bluff/Omaui. CRI 140011. Endangered plant Gunnera hamiltonii. (ref. 114).
 Southern Titi Islands. CRI 140033. Endangered S.I. saddlebacks (ref. 9).
 Doughboy Bay. CRI 140034. Endangered plant Gunnera hamiltonii (ref. 114).
 Masons Bay. CRI 140035. Endangered plant Gunnera hamiltonii and rare plant pingao and sand spurge (ref. 114).
 East and West Ruggedy. CRI 140040. Endangered plant Gunnera hamiltonii (ref. 114).

Sites of National Importance:

Fortrose Spit / Toetoes Harbour. CRI 140006. Whitebait Fishery (ref. 26).
 Tiwai / Awarua Bay. CRI 140010. Waders and Waterfowl Habitat (ref. SSWI).
 New River Estuary / Sandy Bay. CRI 140012. Outstanding wetland (ref. WERI, SSWI, WNIF).
 Jacobs River estuary / Riverton. CRI 140014. Outstanding wetland & Wildlife habitat (ref. WERI, SSWI).
 Foveaux Strait. CRI 140015. Oyster beds (ref. 23).

Stewart Island Sites: These all have high intrinsic island values, including very high naturalness, remarkable landscapes, a wild coastline - remnant of old New Zealand, and one of the largest areas of unmodified marine habitats in New Zealand. (NZFS et. al., 1978; Queen Elizabeth II Trust, 1978; Grange & McKnight, 1987; Wilson, 1987)

North East Stewart Island. CRI 140019. Ackers cottage and yellow-eyed penguin breeding sites (ref. 9).
 Smoky Beach. CRI 140019A. Yellow-eyed penguin breeding site (ref. 9).
 Ulva Island. CRI 140023. Part of Paterson Inlet (ref. 40, 87).
 The Neck. CRI 140024. Part of Paterson Inlet (ref. 40, 87).
 SE Stewart Island - Bench Island to Lords River. CRI 140025. Rare plants punui and Cooks scurvy grass (ref. 114).
 Port Adventure. CRI 140026. Rare plant pingao (ref. 114).
 Lords River. CRI 140027. Yellow-eyed penguins (ref. 9).
 SE Stewart Island Owen Head to Whale Passage. CRI 140029. Yellow eyed penguin breeding sites (ref. 9).
 Port Pegasus. CRI 140031. Black coral (ref. 40).
 S to SW Coast Stewart Island. CRI 140032. Rare plant pingao, Hookers sea lions, yellow-eyed penguins (ref.9, 114).
 Western Stewart Island Coast. CRI 140037. High degree of naturalness (ref. 40).
 Big Hellfire Beaches and Sandpass. CRI 140038. Rare plant pingao (ref. 114).
 Waitutu/Wairaurahiri. CRI 140044. Ancient marine terraces, rare plant pingao (ref.114).
 Waikawa Harbour. CRI 140001. Wetland important to fisheries (ref. 26)
 The Reservoir / Haldane / Slope Point. CRI 140003. Wetland (ref. WERI).
 Waipapa Beach / Lake Brunton / Waipapa Point. CRI 140004. Wetland important to fisheries (ref. 26).
 Lake George /Kawakaputa. CRI 140018. Wetland important to fisheries (ref. 26).
 Port Craig - Sandhill Point. CRI 140043. Rare plants pingao and sand spurge (ref. 114).

Sites of Regional Importance:

Lake Vincent / Frasers Beach. CRI 140005. Wetland important to fisheries (ref. 26).
 Oreti Beach Embayment. CRI 140013. Capt. Howell's House (ref. HPT).
 Riverton / Colac Bay. CRI 140016. Pillow lava geological formations (ref. 59).
 Pahia - Old Man Rock. CRI 140041. Pahia Hill forest (ref. SSWI).
 Te Wae Wae Bay Coastal. CRI 140042. Habitat for waterfowl - Waiau Lagoon (ref. SSWI).

Sites of Unknown Importance:

Catlins Coastal. CRI 140008.
Toetoes Coastal / Dog Island. CRI 140006.
Eastern Foveaux Shelf. CRI 140072.
Centre Island / Escape Reefs. CRI 140017.
Eastern Stewart Island Shelf. CRI 140028.
Snares shelf. CRI 140030.
Western Stewart Island Shelf. CRI 140036.
Western Foveaux Shelf. CRI 140045.

5. ISSUES

5.1 Fishing Issues

5.1.1 The depletion of paua stocks around almost all the rocky coastline in the conservancy.

The severity of this has been more difficult to assess on the Fiordland coast because of the remoteness and ruggedness of this area. There has been depletion not only of legal sized paua but also of juvenile stocks and there is widespread doubt that existing breeding stocks are sufficient to repopulate the coastlines.

The full effect on subtidal communities has yet to be assessed.

This depletion has also occurred in areas only open to recreational divers eg; around Omaui. Parts of the Southland coast have high use for gathering of kaimoana - by Maori, Polynesian and Europeans. Paua poaching and black marketing is a further issue.

5.1.2 The decline in mussel stocks in certain areas.

This is because of over-harvesting, particularly in the Riverton area where a temporary one year ban on all shellfish harvesting is now in place; this may need to be extended. The Bluff Omaui area also receives heavy use.

These two issues were discussed in depth at recent meetings of recreational fishermen and divers in Invercargill called by MAFFish.

5.1.3 The decline in crayfish stocks.

This has occurred particularly in areas of resident crays as opposed to the run fish which migrate clockwise around New Zealand. Areas of particular concern are in the Fiords, and around Stewart Island and the Foveaux Strait Islands. The problem is being addressed by the quota management system, but in accessible areas, recreational divers heavily fish the remaining stock eg; Paterson Inlet and Milford Sound.

5.1.4 Decline in scallop stocks particularly in the Stewart Island Inlets and in Fiordland.

The Paterson Inlet stocks are of grave concern locally because of the amount of scallops a charter boat full of divers can take (legally) day after day.

5.1.5 Decline in Foveaux Strait oysters.

Since the advent of the parasite bonamia, and subsequent depletion of Foveaux Strait oyster stocks oystermen have expressed serious concerns about the sustainability of the present allowable catches.

5.1.6 Taiapure areas.

Under contract to MAFFish, Kelly Davis of the Ngai Tahu is compiling claims for taiapure areas, under the Maori Fishing Act. The areas proposed by the tangata whenua, at this stage cover parts of Stewart Island, and the Southland coast. In some cases there is a need to settle such claims before marine protected area proposals are supported by the tangata whenua.

There are also claims before the Waitangi Tribunal for the rights to marginal strips which front Maori land on Stewart Island. This is largely because of the decline in kaimoana available in these areas.

5.1.7 Fish stocks in Milford Sound.

There has been a serious decline in fish stocks in Milford fishing because of recreational fishing here (the area is closed to commercial take). There is little documented evidence of this, but both local amateur and commercial fishermen have expressed concern.

5.2 Aquaculture

Areas that are most suitable for aquaculture, given present technology, are also those that have high conservation value - coastal areas with high water quality, relatively sheltered areas which are generally those used for recreation.

Of the different types of aquaculture, salmon and mussels are presently being farmed in Big Glory Bay, Stewart Island, and nori in Bluff Harbour.

The issues here can be divided into :

- effect of existing farms on the environment.
- planning issues - where should various types of aquaculture be allowed?
- contingency planning for algal blooms in Big Glory Bay.
- achieving full licensing for the Big Glory Bay salmon farms.

Appendix III outline background details to these issues.

5.3 Control Of Introduced Species - Weeds and Animals

5.3.1 Dune species

Along the Southland coast marram, lupins, gorse and broom in particular have reduced the natural diversity of species and replaced rare species on both dunes and coastal turf communities.

In Fiordland and Stewart Island there are some of the only dune areas left in New Zealand with intact vegetation species and abundant native dune species such as pingao and *Euphorbia glauca* also rare species including *Gunnera hamiltonii*. Marram is widespread along both coasts and control measures are underway to stop further spread.

5.3.2 Deer and Possums

Along almost all the conservancy coastlines with intact forest cover, as in Fiordland and on Stewart Island, deer and possums are a threat. They have had a dramatic effect particularly by weakening forest structure behind dunes, allowing these to move further inland. In places coastal die-back is hastened by browsing and depletion of understorey species, as on the east coast of Stewart Island.

5.3.3 Predators on Islands

There is a need to prevent the introduction of further predators to islands particularly those that are currently rodent-free. This is especially important where these islands are or will be used for endangered species management.

5.4 Human Use Of The Coast

5.4.1 Southland estuaries

At New River estuary

- siltation
- water pollution from numerous sources eg; tip, sewage plant
- *Spartina* spread

all threaten the high natural values of the estuary. Such problems also occur in the other Southland estuaries to varying extents. Further clearance of vegetation cover upstream, and flooding such as of Invercargill is a major problem.

5.4.2 Whitebaiting

This is a large fishery with a strong traditional component. The issues cover law enforcement (particularly on areas which receive little policing at present - Big Bay, Aparima and Pourakino Rivers), species management and the protection of spawning areas.

5.4.3 The possibility of a nickel smelter in the south.

Recent investigation identified the head of Bluff Harbour as the industry's preferred site. This area has important natural and historical values; nickel smelters produce large amounts of slag. The possibility of further air and water pollution, and the need for reclamations to provide shipping access is also of concern.

5.4.4 Black Coral.

There has been illegal harvesting of black coral from Fiordland. This is not yet a major issue but is becoming an increasing problem.

5.4.5 Tourism.

An increase in nature tourism has increased the use of more remote areas. In places there is a conflict between the natural values of these areas and the effect of increased use - as at Milford Sound where a planned redevelopment at the head of the sound has received approval. At Cromarty, a small enclave of freehold land in Fiordland National Park, a tourist lodge is being built. The owner is promoting the area by advertising such activities as fossicking. There is a high cost attached to policing these remote areas.

5.4.6 Logging.

A potential threat to coastal conservation values is the possibility of logging the extensive Maori-owned coastal forests around the Waitutu - Wairaurahiri area.

5.5 Marine Protection

In Southland Conservancy, the greater part of the coastline has high conservation value; this has been recognised and the land is protected - as in Fiordland National Park, on Stewart Island, and on island nature reserves such as Bench, Whero and Codfish Island.

Yet there is still little public awareness of the special ecological features of the subtidal ecosystems of these areas - such as the Fiords and Stewart Island inlets.

Additionally fishing, in its many forms, is allowed in almost all these areas. In those closed to commercial take by Fisheries Regulations recreational fishing can result in just as big a depletion of fish stocks. This is occurring in Milford Sound.

There is an urgent need to provide further protection for much of the the conservancy coastline. This may take the form of marine reserves to protect special ecological features of associations as in the Fiords; alternatively reserves may protect representative areas, parts of the Southland coastline for example.

The ecological wisdom of allowing fishing largely unrestricted by method or species, around virtually all these natural coastlines of Fiordland, Stewart Island, Waitutu and the offshore islands also needs to be assessed. There is also a need to make more known about the uniqueness of these areas.

6 FUTURE DIRECTIONS FOR CRI IN SOUTHLAND

6.1 To fill the gaps in available information

6.1.1 Literature searches to identify all the information relevant to marine ecological values (including scientific work) for:

- subtidal areas of Fiordland, including the shelf areas.
- all marine areas, particularly Foveaux Strait, the South coast, and the Sandhill Point to Puysegur coast.

To date literature searches have only been completed for Stewart Island.

6.1.2 Compilation of the Maori values of the conservancy coastline.

This requires close liaison with the local Maori people and co-operation with MAFfish who are compiling cases for taiapure areas. There is a need to make sure the collection of this information is not being duplicated by various agencies, as this could jeopardise the ease with which we can obtain information directly from the Maori people.

6.2 Effects of Fishing

The collection and collation of any existing information on the effects of fishing (methods, species, levels) in areas with important populations of seabirds and marine mammals. This should include marine rubbish and fuel spills; specific areas are Western Foveaux Strait in which Codfish Island and the Solanders are situated and the Subantarctic Islands.

This research should tie in with the assessment of the decline in the yellow-eyed penguin problem around the Southland coast, so it crosses the boundaries between CRI and species management.

6.2.2 An assessment of the effects of fishing on subtidal communities.

Key areas - Milford Sound

- Paterson Inlet
- an area in which paua have been severely depleted.

Little information is available on the recruitment of fish and rock lobsters to the inner Fiords; the fact that fishermen are no longer trying to catch crayfish here may indicate a serious decline.

This project would also require the co-operation of MAFfish.

6.3 Field Surveys and Survey Write-ups

6.3.1 Accumulation of further ecological information about parts of the conservancy coastline.

This is ongoing field survey work which also includes the collation of existing information.

- Key areas
- Southland estuaries - estuarine ecology and physical processes eg, hydrology.
 - representative areas of Southland coast - this would comprise reconnaissance work on rocky intertidal and subtidal areas.
 - areas of Fiordland in which little scientific work has been done to date particularly Sutherland Sound because of its unique shallow estuarine areas dividing the centre of the fiord.
 - on Stewart Island - around Codfish Island and the north western coastline from Masons to Smoky - all reconnaissance work on rocky intertidal and subtidal areas.
 - finish field work at Pegasus, specifically on geological/geomorphological features and coastal processes and hydrology.
 - Waitutu/Wairarauhiri rock shelves - reconnaissance of the marine ecology.

6.3.2

Finish collating and writing up existing CRI field work already carried out - Paterson Inlet, Port Adventure and Port Pegasus, Stewart Island. Develop a consistent methodology for similar habitats eg; inlets, and standards for work.

6.4 Publications

To increase public awareness about our coastline there is a need to present some of the information accumulated during this first order survey in a more "user-friendly" manner.

Priorities

- heavy use areas like the Southland estuaries with which the local population can strongly identify.

- special areas like the Fiords, which already have a high public profile; extend this to include the shoreline and the subtidal areas so there is greater appreciation of the vulnerability of these areas.

6.5 Historical

Continue surveying areas of the coastline which have yet to be systematically searched for archaeological sites particularly in Fiordland and the south coast.

This work probably comes under Historical Inventory (Key Output 31 rather than CRI).

6.6 Subantarctic Islands

These island groups were not included in the first order survey, although part of Southland Conservancy. A collation of existing information is required. Currently Dr Cameron Hay is preparing an case for DOC to enable the exclusion of fishing from these areas to be continued. This research needs to be extended to cover subtidal communities and fish species out to the 12 mile limit.

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9. APPENDIX I

GLOSSARY OF SPECIES

Coastal Plants

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS
<i>Angelica</i>	<i>Angelica</i> sp.	
<i>Beech, mountain</i>	<i>Nothofagus solandri</i> var. <i>cliffortiodes</i>	
<i>Beech, silver</i>	<i>Nothofagus menziesii</i>	
<i>Bidi-bidi, dwarf</i>	<i>Acaena microphylla</i> var. <i>pauciglochidiata</i>	
<i>Blackberry</i>	<i>Rubus fruticosus</i> aggregate	
<i>Boxhorn</i>	<i>Lycium ferocissimum</i>	
<i>Broadleaf</i>	<i>Griselinia lucida</i> and <i>G. littoralis</i>	
<i>Broom</i>	<i>Cytisus scoparius</i>	
<i>Old mans beard</i>	<i>Clematis vitalba</i>	
<i>Club rush</i>	<i>Scirpus nodosus</i>	
<i>Cooks scurvy grass</i>	<i>Lepidium oleraceum</i>	Vulnerable (Wilson and Given 1990)
<i>Cord grass</i>	<i>Spartina</i> sp.	
<i>Cushion plant</i>	<i>Scleranthus uniflorus</i>	
<i>Eel grass</i>	<i>Zostera novaezelandica</i>	
<i>Flax, lowland</i>	<i>Phormium tenax</i>	
<i>Foxglove</i>	<i>Digitalis purpurea</i>	
<i>Gahnia</i>	<i>Gahnia proceros</i>	
<i>Gorse</i>	<i>Ulex europaeus</i>	
<i>Halls totara</i>	<i>Podocarpus hallii</i>	
<i>Iris, native</i>	<i>Libertia peregrinans</i>	Rare (Given 1990)
<i>Jointed wire rush</i>	<i>Leptocarpus similis</i>	
<i>Kahikatea</i>	<i>Dacrydium dacrydioides</i>	
<i>Kamahi</i>	<i>Weinmannia racemosa</i>	
<i>Kiekie</i>	<i>Freycinetia banksii</i>	
<i>Kokomuka</i>	<i>Hebe elliptica</i>	
<i>Lyalls carrot</i>	<i>Anisotome lyallii</i>	
<i>Macrocarpa</i>	<i>Cupressus macrocarpa</i>	
<i>Mamaku</i>	<i>Cyathea medullaris</i>	
<i>Manuka</i>	<i>Leptospermum scoparium</i>	
<i>Maori onion</i>	<i>Bulbinella gibbsii</i>	
<i>Marram grass</i>	<i>Ammophila arenaria</i>	
<i>Mat daisy</i>	<i>Raoulia</i> sp. aff. <i>hookeri</i>	
<i>Matagouri</i>	<i>Discaria toumatou</i>	
<i>Montbretia</i>	<i>Crocodymia X crocosmiiflora</i>	
<i>Mountain daisy</i>	<i>Celmisia rigida</i>	
<i>Muttonbird scrub</i>	<i>Brachyglottis rotundifolia</i> = <i>B. reinoldii</i>	
<i>Ngaio</i>	<i>Myoporum laetum</i>	
<i>Pingao</i>	<i>Desmoschoenus spiralis</i>	Rare (Given 1990)
<i>Poa grass</i>	<i>Poa astonii</i>	
<i>Poa grass</i>	<i>Poa triodioides</i>	
<i>Poa grass</i>	<i>Poa poppelwellii</i>	Rare (Johnson 1986)
<i>Punui</i>	<i>Stilbocarpa robusta</i> and <i>S. lyallii</i>	Vulnerable (Wilson and Given 1989)
<i>Pygmy pine</i>	<i>Lepidnothamnus laxifolius</i>	
<i>Ragwort</i>	<i>Senecio jacobaea</i>	
<i>Rata, climbing</i>	<i>Metrosideros perforata</i>	
<i>Rata climbing</i>	<i>Metrosideros fulgens</i>	
<i>Rata, southern</i>	<i>Metrosideros umbellata</i>	
<i>Raupo</i>	<i>Typhus orientalis</i>	
<i>Red tussock</i>	<i>Chionochloa rubra</i>	

Ribbonwood, lowland

Rimu

Sand coprosma

Sand daphne

Plagianthus divaricatus

Dacrydium cupressinum

Coprosma acerosa

Pimelea lyallii

Coastal plants continued

<i>Sand sedge</i>	<i>Carex pumila</i>	
<i>Selliera</i>	<i>Selliera radicans</i>	
<i>Shore bindweed</i>	<i>Calystegia soldanella</i>	
<i>A shore buttercup</i>	<i>Ranunculus recens</i>	
<i>Shore gentian</i>	<i>Gentiana saxosa</i>	
<i>Shore spurge</i>	<i>Euphorbia glauca</i>	<i>Vulnerable (Wilson and Given 1989)</i>
<i>Shore tussock</i>	<i>Poa tridiodes</i>	
<i>Shrub daisy</i>	<i>Olearia nummularifolia</i>	
<i>Spanish heath</i>	<i>Calluna vulgaris</i>	
<i>Spartina</i>	<i>Spartina anglica</i>	
<i>Stewart Island aniseed</i>	<i>Gingidia flabellata</i>	<i>Stewart Is endemic (Wilson 1982)</i>
<i>Stewart Island forget-me-not</i>	<i>Myosotis rakiura</i>	
<i>Stewart Island tree groundsel</i>	<i>Brachyglottis stewartiae</i>	<i>Local (Johnson 1986)</i>
<i>Teteaweke</i>	<i>Olearia opporina</i>	
<i>Tree lupin</i>	<i>Lupinus arboreus</i>	
<i>Trefoil</i>	<i>Myriophyllum robustum</i>	<i>Vulnerable (Wilson and Given 1989)</i>
<i>Totara</i>	<i>Podocarpus totara</i>	
<i>Wild spaniard</i>	<i>Aciphylla glaucescens</i>	
<i>Wilding pines</i>	<i>Pinus spp.</i>	
<i>Willow</i>	<i>Salix fragilis</i>	
<i>Wire rush</i>	<i>Empodisma minus</i>	
<i>Wood rush, coastal</i>	<i>Luzula banksiana var. acra</i>	
<i>Wood rush, dwarf</i>	<i>Luzula celata</i>	
	<i>Carex pleiostachys</i>	
	<i>Gunnera hamiltonii</i>	<i>Endangered (Wilson and Given 1989)</i>
<i>A reed</i>	<i>Juncus caespiticus</i>	
<i>A fern</i>	<i>Pteris macilentia</i>	

Marine Algae

<i>Bull kelp</i>	<i>Durvillea antarctica</i>
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Coastal Birds

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS (Bell 1986)
Bellbird	<i>Anthornis melanura melanura</i>	
Bittern, Australasian	<i>Botaurus stellaris poiciloptilus</i>	Threatened
Brown creeper	<i>Finschia noveseelandiae</i>	
Crake, marsh	<i>Porzana pusilla affinis</i>	
Crake, spotless	<i>Porzana tabuensis plumbea</i>	
Curlew, Far Eastern	<i>Numenius madagascariensis</i>	Rare
Dotterel, banded	<i>Charadrius bicinctus bicinctus</i>	Threatened
Dotterel, New Zealand	<i>Charadrius obscurus</i>	Threatened
Duck, blue	<i>Hymenolaimus malacorhynchos</i>	Threatened
Duck, grey	<i>Anas superciliosa superciliosa</i>	
Duck, mallard	<i>Anas platyrhynchos platyrhynchos</i>	
Duck, shoveller	<i>Anas rhynchotis variegata</i>	
Egret, cattle	<i>Bubulcus ibis</i>	
Falcon, New Zealand	<i>Falco novaeseelandiae</i>	Threatened
Fernbird, South Is.	<i>Bowdleria punctata punctata</i>	Threatened regionally
Gannet, Australasian	<i>Sula bassana serrator</i>	
Godwit, bar-tailed	<i>Limosa lapponica baueri</i>	
Goose, Canada	<i>Branta canadensis</i>	
Gull, red-billed	<i>Larus novaehollandiae scopulinus</i>	
Gull, Southern black-backed	<i>Larus dominicanus</i>	
Heron, reef	<i>Egretta sacra sacra</i>	Threatened
Heron, white	<i>Egretta alba modesta</i>	Endangered
Heron, white-faced	<i>Ardea novaehollandiae novaehollandiae</i>	
Kaka, South Island	<i>Nestor meridionalis meridionalis</i>	Rare, regionally threatened
Kakapo	<i>Strigops habroptilus</i>	Endangered
Kingfisher, New Zealand	<i>Halcyon sancta vagans</i>	
Kiwi, South Is brown	<i>Apteryx australis australis</i>	Threatened
Kiwi, Stewart Is brown	<i>Apteryx australis lawryi</i>	
Knot	<i>Calidris canutus</i>	
Kokako, South Is	<i>Callaeas cinerea cinerea</i>	Endangered
Mallard	<i>Anas platyrhynchos platyrhynchos</i>	
Mollymawk, Buller's	<i>Diomedea bulleri</i>	
Muttonbird	<i>Puffinus griseus</i>	
Oystercatcher, South Is. pied	<i>Haematopus ostralegus finschi</i>	
Oystercatcher, variable	<i>Haematopus unicolor</i>	Rare
Parakeet, red-crowned	<i>Cyanoramphus novaezelandiae novaezelandiae</i>	Threatened regionally
Parakeet, yellow-crowned	<i>Cyanoramphus auriceps auriceps</i>	
Penguin, Fiordland crested	<i>Eudyptes pachyrhynchus pachyrhynchus</i>	Rare, regionally threatened
Penguin, southern blue	<i>Eudyptula minor minor</i>	
Penguin, yellow-eyed	<i>Megadyptes antipodes</i>	Rare, regionally threatened
Petrel, Cooks	<i>Pterodroma cookii cookii</i>	Regionally threatened
Petrel, mottled	<i>Pterodroma inexpectata</i>	Threatened regionally

Coastal Birds continued

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS
Petrel, South Georgian	<i>Pelecanoides georgicus</i>	Endangered
Petrel, Southern diving	<i>Pelecanoides urinatrix chathamensis</i>	
Petrel, Southern giant	<i>Macronectes giganteus</i>	
Pipit, New Zealand	<i>Anthus novaeseelandiae novaeseelandiae</i>	
Plover, grey	<i>Pluvialis squatarola</i>	Rare
Plover, least-golden	<i>Pluvialis fulva</i>	Rare
Plover, spur-winged	<i>Vanellus miles novaehollandiae</i>	
Prion, broad-billed	<i>Pachyptila vittata vittata</i>	
Pukeko	<i>Porphyrio porphyrio melanotus</i>	
Rail, banded	<i>Rallus philippensis assimilis</i>	Threatened
Rifleman, South Is	<i>Acanthisitta chloris chloris</i>	Threatened regionally
Robin, South Island	<i>Petroica australis australis</i>	Threatened regionally
Robin, Stewart Island	<i>Petroica australis rakiura</i>	Threatened regionally
Ruff	<i>Philomachus pugnax</i>	
Saddleback, South Is	<i>Philesturnus carunculatus carunculatus</i>	Endangered
Sanderling	<i>Calidris alba</i>	Rare
Scaup, new Zealand	<i>Aythya novaeseelandiae</i>	
Shag, black	<i>Phalacrocorax carbo novaehollandiae</i>	
Shag, little black	<i>Phalacrocorax sulcirostris</i>	
Shag, pied	<i>Phalacrocorax varius varius</i>	
Shag, spotted	<i>Stictocarbo punctatus punctatus</i>	
Shag, Stewart Island	<i>Leucocarbo carunculatus chalconotus</i>	Rare
Shearwater, sooty	<i>Puffinus griseus</i>	
Shoveler, New Zealand	<i>Anas rhynchos variegata</i>	
Skua Southern Great	<i>Stercorarius skua lonnbergi</i>	
Snipe, Japanese	<i>Gallinago hardwickii</i>	
Stils, pied	<i>Himantopus himantopus leucocephalus</i>	
Swan, black	<i>Cygnus atratus</i>	
Takahe	<i>Notornis mantelli</i>	Endangered
Tautler, Siberian	<i>Tringa brevipes</i>	Rare
Tern, Caspian	<i>Hydroprogne caspia</i>	Threatened
Tern, white-fronted	<i>Sterna striata</i>	
Turnstone	<i>Arenaria interpres interpres</i>	
Weka, Stewart Island	<i>Gallirallus australis scotti</i>	Threatened regionally
Weka, Western	<i>Gallirallus australis australis</i>	
White-faced heron	<i>Ardea novaehollandiae novaehollandiae</i>	
Wrybill	<i>Anarhynchus frontalis</i>	Threatened
Yellowhammer	<i>Emberiza citrinella caliginosa</i>	
Yellowhead	<i>Mohoua ochrocephala</i>	Threatened

Terrestrial mammals

COMMON NAME	SCIENTIFIC NAME
Bat, greater short-tailed	<i>Mystacina robusta</i>
Bat, lesser short-tailed	<i>Mystacina tuberculata</i>
Cat, feral	<i>Felis caus</i>
Deer, red	<i>Cervus elaphus scoticus</i>
Deer, white-tailed/ virginian	<i>Odocoileus virginianus borealis</i>
Pig, feral	<i>Sus scrofa</i>
Possum, brushtail	<i>Trichosurus vulpecula</i>
Rat, kiore	<i>Rattus exulans</i>
Rat, Norway	<i>Rattus norvegicus</i>
Rat, ship	<i>Rattus rattus</i>

Reptiles, Invertebrates

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS
Skink, Fiordland	<i>Leiopisma acrinasum</i>	
Skink, green	<i>Leiopisma chloronoton</i>	
A skink	<i>Leiopisma nigraplantare polychroma</i>	
A skink	<i>Leiopisma inconspicuum</i>	
A moth	<i>Merophyas paraloxa</i>	
A moth	<i>Protithona potamias</i>	
A moth	<i>Asaphodes stephanitis</i>	
A beetle	<i>Lichenobius littoralis</i>	
A snail	<i>Thalassichelix obnubila</i>	
A snail	<i>Powelliphanta hochstetteri lignaria</i>	Rare (Bell 1986)
A snail	<i>Powelliphanta fiordlandica</i>	
Leech	<i>Ornithobdella</i> sp.	Local
Giant weta	<i>Deinacrida carinata</i>	Threatened (Bell 1986)

Freshwater fish

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS
Bully, red-finned	<i>Gobiomorphus hutoni</i>	
Bully, giant	<i>Gobiomorphus gobiodes</i>	
Eel, long-finned	<i>Anguilla dieffenbachii</i>	
Koaro	<i>Galaxias brevipinnus</i>	
Kokopu, giant	<i>Galaxias argenteus</i>	Rare - indeterminate (Williams and Given 1981)
Kokopu, banded	<i>Galaxias fasciatus</i>	
Kokopu, short-jawed	<i>Galaxias postvectis</i>	Rare - indeterminate (Williams and Given 1981)
Inanga	<i>Galaxias maculatus</i>	
Lamprey	<i>Geotria australis</i>	
Perch	<i>Perca fluviatilis</i>	
Trout, brown	<i>Salmo trutta</i>	
Trout, rainbow	<i>Salmo gairdnerii</i>	
Salmon, quinnat	<i>Oncorhynchus tshawytscha</i>	
Salmon, Atlantic	<i>Salmo salar</i>	

Coastal Fish

COMMON NAME	SCIENTIFIC NAME	HABITAT
Barracouta	<i>Thyrsites atun</i>	Generally deep water
Bellowsfish, crested	<i>Notopogon lilliei</i>	Deep water
Cod, blue	<i>Parapercis colias</i>	Common in coastal waters
Cod, red	<i>Pseudophycis bachus</i>	Nocturnal in the shallows
Dogfish, spotted spiny	<i>Squalus acanthias</i>	Common in all coastal waters
Eel, long finned	<i>Anguilla dieffenbachii</i>	Estuarine
Eel, shortfinned	<i>Anguilla australis</i>	Estuarine
Elephantfish	<i>Callorhynchus milii</i>	Generally deep water
Flounder, black	<i>Rhombosolea retiaria</i>	Sand, mud
Flounder, sand	<i>Rhombosolea plebeia</i>	Sand
Greenbone	<i>Odax pullus</i>	Shallows of kelp reefs
Gurnard, red	<i>Chelidonichthys kumu</i>	Sand or mud
Hagfish	<i>Eptatretus cirratus</i>	Reefs and open bottom
Hapuku (groper)	<i>Polyprion oxygeneios</i>	Rarely seen in shallows
Kahawai	<i>Arripis trutta</i>	Shallow and pelagic
Lamprey	<i>Geotria australis</i>	Mud, sometimes estuarine
Ling	<i>Genypterus blacodes</i>	Deep water
Mackerel, Jack	<i>Trachurus declivis</i>	Schooling pelagic, mid/deep water
Marblefish	<i>Aplodactylus arcidens</i>	Reefs, near caves and crevices
Moki, red	<i>Cheilodactylus ephippium</i>	Reefs
Moki, blue	<i>Laridopsis ciliaris</i>	Sand, mud and occasionally reefs
Moki, copper	<i>Laridopsis forsteri</i>	Sand, mud and occasionally reefs
Mullet, yellow eyed	<i>Aldrichetta forsteri</i>	Shallows and estuarine
Opalfish	<i>Hemerocoetes monopterygius</i>	Seen occasionally in coastal waters
Perch, butterfly	<i>Caesioperca lepidoptera</i>	Form schools above rocky bottoms
Perch, red-banded	<i>Ellerkeldia huntii</i>	Reefs with boulders or caves
Perch, red-lined	<i>Lepidoperca sp.</i>	Deep water on steep fiord faces
Perch, sea (jock stewart)	<i>Helicolenus percoides</i>	Reefs and open bottom
Perch, southern splendid	<i>Callanthis sp.</i>	Reefs, usually deeper than 25m,
Pigfish, southern	<i>Congiopodus leucopaecilus</i>	Shallow reefs, harbours and bays
Rig	<i>Mustelus lenticulatus</i>	Common in all coastal waters.
Roughy, common	<i>Paratrachichthys trailli</i>	Nocturnal in the shallows
Scorpionfish, dwarf	<i>Scorpaena papillosus</i>	Shallow reefs where there is cover
Sea dragon, Spiny	<i>Solegnathus spinosissimus</i>	Reefs
Sea horse	<i>Hippocampus abdominalis</i>	Harbours, bays and reefs
Shark, seven-gilled	<i>Heptranchias perlo</i>	Occasional in temperate waters
Smelt	<i>Retropinna retropinna</i>	Estuarine
Spotty (pakei)	<i>Notolabrus celidous</i>	Loose schools in sheltered areas.
Stargazer, giant (monkfish)	<i>Kathetostoma giganteum</i>	Sand or mud
Stargazer, spotted	<i>Genyagius monopterygius</i>	Sand or mud
Sweep	<i>Scorpius lineolatus</i>	In Fiordland restricted to deep water crevices
Tarakahi	<i>Nemadactylus macropterus</i>	Sand or mud, occasionally near reef edges
Telescopefish	<i>Mendosoma lineatum</i>	Form large schools over reefs
Triplefin, blue-dot	? Undetermined at present	Reefs
Triplefin, common	<i>Forsterygion sp.</i>	Shallow cobble reefs
Triplefin, oblique- swimming	<i>Obliquichthys maryannae</i>	Form schools above shallow reefs
Triplefin, yellow- black	<i>Forsterygion sp.</i>	Reefs, generally below 15m
Trumpeter	<i>Latis lineata</i>	Reefs
Warehou, common	<i>Seriotelella brama</i>	Occasional juveniles seen in fiords
Wrasse, banded	<i>Notolabrus fucicola</i>	Shallow kelp reefs
Wrasse, girdled	<i>Notolabrus cinctus</i>	Reefs, usually below 15m
Wrasse, scarlet	<i>Pseudolabrus miles</i>	Reefs, near boulders, usually below 15m

Marine Invertebrates

COMMON NAME	SCIENTIFIC NAME	CONSERVANCY CATEGORY
Coral, black	<i>Anipathes fiordensis</i>	Internationally commercially threatened (IUCN)
Red, white, pink hydro corals	Order Stylasterina	
Sea pen	<i>Sarcophyllum bollonsi</i> or <i>Sarcophyllum</i> sp	
Tube anemone	<i>Cerianthus</i> sp.	
a brachiopod	<i>Neothyris lenticularis</i>	
Brachiopod, black	<i>Notosaria nigricans</i>	
Brachiopod, white	<i>Liothyrella novaezelandica</i>	
Brachiopod, red-ribbed	<i>Terebratella sanguinea</i>	
Brachiopod, small red	<i>Terebratella inconspicua</i>	
Cockle	<i>Chione stuechburyi</i>	
Cockle, dog	<i>Glycymeris laticostata</i>	
Cockle, purple	<i>Venericardia purpurata</i>	
Geoduc	<i>Ponopae</i> spp.	
Morning star	<i>Tawera spissa</i>	
a mollusc	<i>Diplodonta globus</i>	
a mollusc	<i>Longimacra elongata</i>	
a mollusc	<i>Scalpomacra scalpellum</i>	
a mollusc	<i>Macra ordinaria</i>	
Mussel, blue	<i>Mytilus edulis</i>	
Octopus	<i>Octopus maorianum</i>	
Octopus, midget	<i>Robsonella australis</i>	
Oyster, Bluff	<i>Ostrea lutaria</i>	
Paua	<i>Haliotis iris</i>	
Pipi	<i>Paphies australis</i>	
Scallop	<i>Pecten novaezelandiae</i>	
Squid, arrow	<i>Notododaris sloanii</i>	
Toheroa	<i>Paphies ventricosa</i>	
Tua tua	<i>Paphies</i> spp	
Kina	<i>Evechinus chloroticus</i>	
Crab, cancer	<i>Cancer novaezealandiae</i>	
Crab, paddle	<i>Ovalipes catharus</i>	
Crab, paddle	<i>Nectocarcinus antarcticus</i>	
Rock lobster	<i>Jasus edwardsii</i>	
Sea tulip	<i>Pyura pachydermatina</i>	

Marine Mammals

COMMON NAME	SCIENTIFIC NAME
Dolphin, bottle-nose	<i>Tursiops truncatus</i>
Dolphin, dusky	<i>Lagenorhynchus obscurus</i>
Dolphin, Hector's	<i>Cephalorhynchus hectori</i>
Fur seal, New Zealand	<i>Arctocephalus forsteri</i>
Orca	<i>Orcinus orca</i>
Sea lion, Hookers (hair seal)	<i>Phocartos hookeri</i>
Seal, leopard	<i>Hydrurga leptonyx</i>
Whale, humpback	<i>Megaptera novaengliae</i>
Whale, minke	<i>Balaenoptera acutorstrata</i>
Whale, southern right	<i>Balaena glacialis australis</i>
Whale, sperm	<i>Physeter macrocephalus</i>

APPENDIX II

FIORDLANDS CULTURAL VALUES - AN OVERVIEW

1. Spiritual Value

The spiritual value of Fiordland and of its coastline is difficult to define; it is a place of solitude, retreat and quiet rejuvenation (Lands and Survey, 1986).

As a whole it holds significant spiritual value for both Maori and Pakeha. Maori legend tells how the sounds of Fiordland came into being (Beattie, 1949).

When Raki (the Sky-father) wedded Papa-tua-nuku each already had children by other unions. Among the sky children who came down to inspect Raki's new wife were four of his sons. They came down in a canoe known as Te Waka-a-Aoraki. After cruising around Papa-tua-nuku who lay as one body in a huge continent known mostly as Hawaiki, disaster overtook them. The karakia (invocation) which should have lifted their canoe to the skies went wrong and their craft sank onto an undersea ridge and turned to stone and earth. The four voyagers were also turned to stone and became mountain peaks.

This is how the Canoe of Aoraki became the South Island. Much labour was required to make it fit for man's occupation, and a benevolent god named Tuy-te-Rakiwhanoa was detailed to see to this. Tu found the western side of the canoe to be one long, high, unknown line and he dealt with it first.

"Tu looked at a long and high wall of rock running from north of Milford Sound down to Puysegur Point. It was an appalling sight and sufficient to daunt the stoutest heart. Tu decided to try and make a few openings in the unbroken line and so let the sea run in. He planted one foot on the cliff and the other many miles further up and began his heroic labours. Repeating the invocation Turaparapa to make the soles of his feet take a firm hold on the rock, he grasped his gigantic axe Te Hamo and set to work to tapahi (chop) into this great mountain wall. The work was hard and he had to tapatapahi (chop repeatedly) to get any work done. To assist him he used to repeat a karakia (invocation) called Tapatapa-te-tapahi, which commanded the rocky wall to split asunder. The work was left quite rough in parts, but the general effect was good, if on a grand godlike scale calculated to inspire awe in human beings."

"Now when Tu had gaps made in the outer wall and the sea began to flow in, he started to push and heave at the inland country to extend the length of the sounds. In doing so the straining caused the places where his feet rested to part from the rest and formed the two islands which the Pakeha calls Resolution and Secretary Islands".

"With his back to the ocean he placed his right foot on the highest peak of Resolution Island (Mt Clerk) and on the highest peak of Secretary Island (Mt Grozno".

Secretary Island became known as Ka-tu-waewae-o-Tu (the standing feet of Tu) and Resolution Island as Mauikatau. Five fingers Peninsula is Tau-moana. Round Resolution Island the line of water (the Bowen Channel and Acheron Passage) which separates it from the mainland is called the channel of Tu, and the same name is applied to the channel around Secretary Island.

"Starting with the more southerly sounds, Tu was inexperienced and left far too many islands in them, but as he proceeded north he made the sounds on more clear-cut lines, and instead of leaving numerous islands, he stacked the material up in higher hills and mountains. As will presently appear he only half-finished Chalky Sound. For the first four sounds he had the assistance of a goddess named Hine-Puaitaha (Lady of Storms), and her aid was of a rather tempestuous nature. The Maori name of Breaksea Sound is Tu Puaitaha, but it is named after a mere man, an ancestral voyager. Feeling very fatigued after hacking out the first four sounds, Tu sat down to rest on Mount Richards, and its name has since then been Te Nohoaka-o-tu (the seat of Tu). As he did so he laid his axe down on Entry Island, and its name is Te Kora-o-Tu. As "Kora" means a spark, as in Te Kora o te ahi (the spark of the fire), and no other meaning is known in the South Island by my mentors, this name was queried, but the old people maintained it was correct.

For the making of the next four sounds Tu received aid from four minor seagods who were brothers or were related to each other, and for their help he let them each make a small sound along the side of Doubtful Sound. These are named after them and First Arm is Taipari-poto (Short Taipari), Crooked Arm is Taipari-nui (Big Taipari), Halls Arm is Taipari-roa (Long Taipari) and Deep Cove is Taipari-riki (Little Taipari). While they were toiling and moiling Tu sat on Te Taumata-o-Tu (the look-out station of Tu) watching their progress and resting from his own strenuous labours. This peak seems to be either Solitary Cone or Mt. George (5340 feet). [Taipari probably means "flowing tide" -H.B].

I have also a little information as to who helped with the next four sounds. Tu was not only supposed to improve the coastline by making openings and letting the sea flow in, but he was to beautify the region by planting vegetation. From the celestial regions he received a gift of three kinds of shrubs or plants known as rotu, puairuru and pokeka-kieke, and these were to adorn the bare mountain sides round the sounds. From this humble beginning sprang up the profuse arborescence that is one of their chief glories.

It will have been noticed that for the first four sounds Tu had the assistance of a wind goddess, and for the next four the aid of four minor seagods. For the next two he was assisted by a friendly goddess named Kahukura (red garments). There was also a god named Kahukura, the famous god of travellers and it must be

clearly understood that in Maori there are no strictly masculine or distinctly famine names.

Kahukura helped Tu to make Charles and Caswell Sounds, but not being accustomed to such work she felt it very severely at first. The hard rock hewing was too much for her so she made a sandy beach, a rare thing in the Sounds and being overcome with woman's weakness, she sat down, and rested on it. This beach is in Charles Sound and its name is Te Onenene, while a cliff away behind it which has a red streak on it is known as Te Pakeke-o-kahukura.

For the making of George, Bligh and Sutherland Sounds, Tu was aided by two more gods known as Ruataka and Ruaora, but what they did was not a very pronounced character, though the heights along the north of George Sound and along the south of Bligh are named Ruataku and Ruaora respectively. Tradition seems to be silent as to what caused Sutherland Sound's different appearance.

It is not known why Tu did not finish Chalky Sound, but we are afforded a clue in the brief tradition that Hinenuitepo visited the inlet and that a ridge up Edwardson Arm (probably Saddle Hill or Square Top) is Te Kuha-o-Hine-nui-te-po (the thigh of Hine). More about this important lady will be related shortly.

Tu now came to Milford Sound, and this proved the toughest job in all his colossal task. After immense exertions he hacked out a rocky inlet and set down to rest on Te Nohoaka-o-Tu (the seat of Tu), now known as the Devils Armchair. While he was sitting here Papa-tua-nuku, the Earth Mother, came to see the work and expressed the opinion that the sides of the sound were so abrupt everywhere that man had no place to land. She asked that a flat be made at the head of the sound and this was done and called Te Wahi-o-papatuanuku (the place of Papatuanuku). This name was abbreviated to Papa-tua-nuku, and it is still the name of where (Donald) Sutherland built his accommodation house and where Milford now is).

No sooner had Tu said farewell to this lady than he was visited by another lady, no less a personage than Te Hine-nui-te-po (the Great Lady of Death). She was related to Tu and came to see what he had been doing. She thought the sounds would be so beautiful that man would wish to live for ever near them, so to remind man of his frailty and mortality she liberated a large sand-fly (namu) at the place named Te Namu-a-Te-Hine-nui-te-po. This happens to be near what the Pakeha calls Sandfly Point. Realising that one sandfly, no matter how large and robust, would soon die, the lady followed it up by many more of the usual size and also by swarms of mosquitoes and fleas, and she commanded all three go into all the sounds, where they have since plagued man.

Each sound was supposed to have a way opening up into the interior from it, and so we find that man could go from Preservation Inlet to Lake Poteriteri, from Dusky and Doubtful to Lake Manapouri, and from Thompson, Caswell, George and Bligh to Lake Te Anau. But what of Milford? This was the hardest problem

of them all and most unfortunately Tu was called away before the work could be undertaken, leaving it to be done by a minor god known as Te Kohaka-o-te-ruru (the nest of the morepork owl)."

2. Early Maori Voyages

After Tu and his helpers had made the South Island in much the shape as we now see it, Polynesian navigators began to visit it. The most illustrious of these was Maui and his exploits have since been magnified into being the heroic feats of a demi-god. The voyagers were much impressed with the majesty of the view and named half a dozen places after crew as in Milford Sound.

Herries Beattie relates two accounts of Maui's arrival in Chalky.

"The first says that there was then the Cunaris Arm but no Edwardson Arm. Maui canoed up to Divide Head and then went to step ashore. He slipped and his left foot sent the water and mud flying before it, forming the Edwardson Arm. This account quotes the Maori saying "No te rereka tu o Maui ki uta, ka kutere o te moana" (the jumping ashore of Maui caused the squelching of the ocean), to prove it was his foot that created the inlet.

"The other account admits that Maui's foot slipped (mania) when he leapt ashore, but it states he fell forward, his two arms instinctively going out and propelling the water both ways. The sound then ended at Divide Head and Maui's mis-step caused both arms to appear. Both accounts agree that the correct name of Divide Head is Te Tapuwae-o-maui (the footstep of Maui), and that the hills behind are rightly called Te Rereka-o-maui (the leap of Maui). The name of Lake Cove at the head of the long Edwardson Arm, Raki-tukutuku, is taken to mean "the day the water was permitted to extend up to this point," While the name of Cunaris Arm (or part of it) Te-Koro-Whaka-unu is considered to imply a desire to quench a thirst, and the reason why Maui desired to land may have been to replenish the store of drinking water.

"From the sounds Maui proceeded round to Omaui (the cliff at New River Heads) and thinking The Canoe of Aoraki (South Island) needed an anchor, he pulled up Stewart Island. He then voyaged up the eastern side of the South Island to Kaikoura where he pulled up that big fish, the North Island. After this he returned to Hawaiki, but he sent back his big canoe, the Mahunui, with instructions that it was to be placed in the very centre of the South Island. This was done, and the Canoe of Maui, turned to stone, stands as the Harper Range by the Rakitata River in Canterbury.

"This canoe of Maui, which was sent back to New Zealand, must not be confused with a later canoe of his, which was projected into the sky and now forms part of the Milky Way. After this notable voyage to our dominion the name of the South

Island was changed from the Canoe of Aoraki to the Canoe of Maui, while Stewart Island was known as the Anchor of Maui's canoe.

"Maui in pulling up Stewart Island from the bottom of the sea to act as an anchor to the South Island, pulled it up so close to the Bluff Peninsula that there was scarcely any seaway left. Kiwa was a great god of the sea, and his younger brother Kewa was very little inferior to him. The name of Foveaux Strait is Te Ara-a-kiwa (the path of Kiwa), and it is said he was far from satisfied with its breadth, and sent Kewa to widen it. Kewa either assumed the shape of a leviathan of the deep, or employed a huge whale named Kewa to do the work, so the alternative name of the strait is Te Ara-a-kewa. This sea-monster decided to eat his way through the obstructing land and, opening his prodigious jaws, he began to munch massive blocks of land, and continued steadily until we have the present strait. Some of the small isles are fragments that dropped from his jaws, while some of the larger islands were left because he did not like their taste. Having gained the open sea he kept on westward, but this vigorous chewing had loosened at least two of his teeth and an eye tooth fell out and is now Solander Island while further on a worn molar dropped out and is now Marshall Rock, near Puysegur. (This story is told with great glee at the Bluff, and it is from a Kati-mamoe source, the original Waitaha narrative being somewhat vague as to whether Stewart Island was the anchor of Aoraki's Celestially-formed canoe or of the later Maui's voyaging canoe." (Beattie, 1949).

2. Traditional Maori Use of Fiordland

The traditional life of the Maoris in Fiordland is better known than in many parts of the South Island. This knowledge comes partly from Maori tradition and archaeological study but also from the records of early European explorers who used the fiords as safe anchorages or who hunted seals there. Captain Cook and his officers and scientists compiled a particularly detailed report of the Maoris they observed in Dusky Sound in 1773.

The Maoris encountered seem generally to have come to Fiordland for months at a time, rather than years, from villages along the shores of Foveaux Strait. Occupation in small huts or rock shelters was the rule. The south coast, especially near its few harbours and the large southern fiords were the coastal areas most commonly occupied. In the fiords there were more occupation sites towards the entrance probably because seals, fish and seabirds were more plentiful here.

For the Maori the main attractions of Fiordland were takiwai, the seals and birds. Loads of takiwai were taken out either by sea voyage or overland to Lake Te Anau via what is now the Milford Track, then by canoe down Lake Te Anau, then down the Waiau River to Te Wae Wae.

Travel by sea, in unua, doubled-hulled canoes depended on favourable conditions and frequently involved quick dashes on calm seas, from one harbour to the next.

During the visits, in summer and autumn to catch and preserve seals and seabirds including titi (muttonbirds): fish was an important part of the Maori's diet, including paua, and mussels. Vegetable foods were scarce.

(Department of Lands and Survey, 1986).

3. Landscape/Aesthetic Value

Fiordland is distinctive. Not only does much of the national park comprise a geological block quite different from the rest of New Zealand, but because of the nature of the rock, landforms are distinct and dramatic. The majestic landscape we see today is the result of a period of erosion by glaciers over two million years.

Glaciers in the west flowed to the sea, excavating troughs to well below sealevel. When the ice melted the sea flooded in to fill the fiords which are such a unique part of Fiordland. Glacial landforms are usually well-preserved because most of the rocks are particularly hard and tough in comparison to those of the Southern Alps (Lands and Survey, 1986).

The landscapes, of such distinctiveness, and unique in New Zealand are of national importance.

It is generally considered that George is the most beautiful sound and Milford the most majestic.
(Beattie, 1949).

APPENDIX III

AQUACULTURE IN SOUTHLAND CONSERVANCY

1) Marine Farm Planning

In early 1989, the Southland United Council, with the support of various agencies (DOC, MAF, Dept of Health, Southland Catchment Board) called for public submissions on the subject of marine farming on the Southland coast, including Stewart Island and Fiordland.

This was in context of a previous such call early 1980's when marine farming was first proposed in the south. After DSIR reports on water quality and the sustainability of existing salmon farming in Big Glory Bay there was a prospect of the salmon farming being permanently licensed. There was also pressure to expand outside the Big Glory Bay which was prohibited by a moratorium placed by the Ministry of Fisheries at the request of the Southland United Council.

It was agreed that a working party comprising representatives from the United Council planning staff, DOC, Health Department, MAF and Southland Catchment Board should review the submissions and make written input about various sites in Southland and their values. Subsequently the United Council prepared a collation of the submissions, a report entitled "An expression of public opinion" which summarised the characteristics, uses and values of various sites, attributes conducive for marine farming and suggested directions for this. A set of background papers was also released.

There was majority agreement from the Working Party that it be noted:

The fiords of Fiordland and the inlets and bays of Stewart Island are the last remaining in relatively unmodified, wild and scenic coastal areas in New Zealand. This gives them a national value that must be recognised in making coastal resource management decisions.

The recommendations were forwarded to the Ministers of Fisheries, Conservation and the Environment.

2) Salmon Farm Relicensing

The procedure by which the existing Big Glory salmon farms could be issued permanent licences to replace their temporary special permits has been the brief of a "Big Glory Working Group". This comprised representatives from the industry, MAFFish, DOC and at times the Ministry for the Environment and the Southland Catchment Board.

To date, full licensing for existing operators has been agreed to but not been implemented because of problems with the assignment of licences to the operating companies rather than present licence holders.

3. Contingency Planning

In early 1989 all the Big Glory salmon farms were temporarily (and illegally) relocated in Paterson Inlet. This move was prompted by the occurrence of a widespread algal bloom in Big Glory Bay; tonnes of salmon kills resulted.

Contingency planning for a further such occurrence has been addressed by the Big Glory Working Party.

Agreement to allow the use of two small areas in Paterson Inlet, under strict conditions, in such emergency situations was reached, but has yet to be given legal status.

There is a conflict here centred on the high natural values of Paterson Inlet particularly the occurrence of brachiopod beds in Paterson Inlet (as detailed in site record 1400). These rare lampshells are extremely susceptible to any increase in sedimentation.

During a relocation of one of the salmon farms in early 1989, it was demonstrated that benthic fauna beneath the farm, including brachiopods, died within one month of the farm being sited above them.

4. Impact of Marine Farms on the Environment

From observations on the salmon farms in Big Glory Bay the following adverse effects on the natural ecosystem have been identified:

1. On marine habitats and communities

- destruction of benthos under and around cages by smothering and eutrophication from excess food and waste sediments.
- modification of benthic communities in area adjacent to the smothered area - the so-called "transition zone" where there is a change in communities in response to a gradient in organic pollution.
- fuel spills
- communities are altered by the naturalisation of farmed species which is inevitable. The immediate concern is the naturalisation of salmon in the Island's rivers, and modification of the native stream fauna.
- regular dumping of dead fish and harvesting offal
- diseases possibly introduced to native species.
- hydrogen sulphide released by the waste sediments is toxic to aquatic life and there is the potential for toxicity problems for distances in the order of hundreds of metres from existing farms.
- accumulation of mercury in the waste sediments
- release of biogas from the sediments and potential ammonia toxicity
- slow rate of decay of waste sediments on abandoned sites

2. on wildlife

- attract predators eg seals and sealions which are shot if a nuisance

- obstruct species - dolphins
 - seagulls are shot if a nuisance
 - nesting and feeding species are disturbed especially yellow-eyed penguins and shags.
 - discarded rubbish poses a potential threat - plastic bags, polystyrene beads and bands.
 - effect of marine farming activity on seal/sealion haulouts
3. destruction of natural character/visual effects
- cages/rafts/houseboats are highly visible
 - houseboats can be moored off-site, therefore effects are further spread into sheltered bays
 - empty cages stored on beaches
 - shore facilities are needed to repair cages and to store gear.
 - rubbish accumulates on beaches even in Little Glory
 - cumulative effects of a number of farms
4. on water quality
- clarity is reduced by suspended sediments etc around the farms - water chemistry is affected to 50m out
 - point source problems are water-blasting of nets and discharges from the houseboats
 - elevated nutrient concentrations
 - possible eutrophication and phytoplankton blooms
 - oxygen depletion near the sea-bed under farms
 - possible increase in faecal coliforms
5. exclusion of other users or interference with their rights
- downgrades the value of natural wild, scenic area
 - structures affect access of users to beaches as do houseboats moored off licenced site
 - navigation is affected
 - anchorages are affected by houseboats and empty cages moored in recognised anchorages
 - where cages are on the beach this affects users of the shore
 - because the area is no longer "wild" recreational experience is affected
 - pressure on local beds of shellfish from staff on site and their visitors.
 - heritage is affected - that area is no longer suitable for future users if structures remain (comparison with Whalers Base, Paterson Inlet where rubbish remains 50 years after it was abandoned)

Additional threats posed by other types of aquaculture:

1. Mussel farms destroy the existing benthos beneath them, mainly by shell accumulation and also the concentration of faeces and pseudo-faeces. A new,

modified marine habitat is created beneath them based species living in or on the shell. Water circulation patterns are also affected by the long-lines.

2. Any farmed species has the potential to naturalise including green-lipped mussels which are uncommon on Southland shores.
3. Estuaries such as the mudflat areas would be particularly vulnerable to any type of marine farming, because of the vulnerability of their natural characteristics to change; in particular
 - the nutrient-trap effect which would accumulate pollutants such as antifouling
 - the low tolerance to changes in oxygen concentration
 - the role of sediments
 - any increase in predators eg fish attracted to mussels which disrupt the food web.

Estuarine organisms would be particularly vulnerable to any production of hydrogen sulphide.

4. Brachiopods have evolved over millions of years in an environment with very low natural levels of sedimentation. Paterson Inlet provides the same kind of habitat that these animals lived in 600 million years ago and so provides a rare insight into the evolution of marine life. But being so slow to evolve, brachiopods would be extremely sensitive to sudden increases in sediment loading. Any aquaculture which increased or concentrated sediments would put near-by brachiopod beds at risk. These species do not have the mechanisms to move out from polluted areas.

Site Record Forms

Site Names: Waikawa Harbour

Site No: 140001

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: G47 22150 53910

Date: 6 March 1990

Brief Description of Site:

This includes Waikawa Harbour and the adjacent sublittoral areas westward to the Brothers Pt. Waikawa is a large open estuary covering approximately 1765 ha of which around 70% is mudflats exposed at low tide. The estuary is fed by the Waikawa River and several small creeks and streams. Although on the eastern shore is a small area of low dunes built by southerly winds. The estuary is well-used by a variety of wading birds and waterfowl; it has lesser value as a wildlife habitat relative to the 5 main Southland estuaries (New River, Awarua Bay, Waituna Lagoon, Jacobs River and Fortrose). The surrounding land beyond the serral fringe is predominately pastoral; small pockets of indigenous forest remain around the shore. The adjacent outer coastline is of high resistant rock forming medium height coastal hills and cliffs. A small commercial fishing fleet is based at Waikawa.

Conservation Values:

Natural: bcd

Cultural: ac

Historic: bcd

Comment:

The estuary is largely unmodified despite the surrounding pastoral land. It is a known nursery area for flat fish particularly for flounders which are found in large numbers; native trout and giant kokopu (WERI1), long and short finned eels and lampreys are present (WNIFD). Whitebait spawn in the Waikawa River. The estuary is used as feeding grounds for white-faced herons, pied oyster-catchers, wrybills, pied stilts, spur-wing plovers and mallard ducks (Sutton 1983). A yellow-eyed penguin (regionally endangered) nesting site is known on the outer head land. Nothing is known of the sublittoral area of the adjacent coast. As a landform Waikawa estuary is of regional importance (Geopreservative Index). The harbour has been proposed as a taiapure site by the tangata whenua which reflects its traditional use (Davis pers. comm.). The small pockets of indigenous forest that remain are an integral part of the areas landscape value (SUC 1989).

Around the shores are a concentration of small, prehistoric Maori sites, some rich in artefacts and possibly archaic (Williams 1983). Many early European sites associated with shore whaling and sawmilling are also present including Grose's station at Trypot Bay 1838-1843. Four historical shipwrecks have been recorded for the area but remains are not known (Ingram 1984). Over the years large numbers and types of Maori artefacts have been collected from the Waikawa area eg adzes, fish hooks, flakes, awls and bird spears.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

Recorded as a wetland of national importance fo fisheries (C grade) Archaeologically, Waikawa is one of the more important areas on the Southland coast (Williams, 1983).

Existing Threats:

Type and Comment: abcdj

Siltation from land clearance both around the estuary and upstream is causing problems, Erosion is occurring at the spot to the south of the estuary (pers. comm. Owaka field centre staff).

Noxious weeds mainly marram and lupin surround a large part of the estuary. Farmed animals wander in and out at will in places. Their main impact is on the sandy areas on the north east side. Spoil and rubbish dumping occur on a small scale in several places *Clematis vitalba* is present in limited extent on the forested areas. The prime threat to the outer rock coast is heavy pressure on the paua stocks from commercial divers, and follow-on effect on the subtidal communities (pers. comm. Owaka field centre staff).

Human Modification and Human Use: abcdhij

Crayfish, blue cod and paua are commercially fished in the coastal area. The Commercial fishing fleet based here, is one of only four in Southland. The boats moor at 2 jetties. There has been commercial netting of freshwater eels and lampreys in the past. Recreational use of the estuary centres on fishing, floundering, set netting, whitebaiting and shellfish gathering to a lesser extent (Buckingham and Hall-Jones 1985). Duckshooting, trail bike riding, pleasure boating and walking are also carried out. Land development around the estuary has led to bulldozers cutting tracks down to the shore in several places. A small amount of reclamation (historical) has taken place. This enabled trams to be used in the transportaton of timber from the sawmills to the boats. Waikawa's isolation and distance from Invercargill ensures use of the area as relatively low and local. The harbour has also been identified as a traditional area for gathering kai moana and is likely to be proposed as a taiapure site (Kelly Davis pers. comm.).

Existing Protection:

Type and Comment: ad

1. Yorks Reserve - a private area part of Catlins Forest Park, comprises 8.48 ha of totara/matai forest on the eastern shore.
 2. Waikawa Harbour Scenic Reserve - 3.4 ha of remnant forest is located behind the fishing jetties.
 3. Waikawa is zoned as estuarine in the District Scheme.
 4. The coast between Waikawa and the Brothers is stewardship land.
 5. The coast between Waikawa and the Brothers is stewardship land.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	②	3	1 Well documented.
Historic	①	2	3	2 Limited information (general).
Threats	1	②	3	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	⑥	⑦	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	②	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Owaka field staff have local knowledge of the area.

Recorded on Existing Databases: **Comment:** Recorded on Wetlands of National Importance to Fisheries database (1987). Waikawa Harbour and North Head Yellow-eyed penguin colony are SSWI sites (1979).

- ① WERI (1979)
 - ② SSWI (1979)
 - ③ PNA (1984)
 - ④ Geopreservation - Landforms
 - ⑤ HPT County Inventories
 - ⑥ Other
 - 7 None
-

Accompanying Maps and Photographs:

Site Names: Porpoise Bay/Curio Bay

Site No: 140002

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: G47 22117 53868

Date: 7 March 1990

Brief Description of Site:

Porpoise Bay is a sandy beach approximately 4.5 km long, open to the south east. The beach is relatively sheltered, backed by low dunes then level ground in pasture. The principal vegetation types are marram/lupin/sedges and totara. Most botanically interesting are small fingers of estuary behind the eastern dunes, fringed with salt-marsh communities. The adjacent coast to the south west consists of rock platforms, backed by low cliffs with level grassy land above. Some saltmarsh communities occupy the toe of the cliffs. Patches of native flax are scattered; the adjacent land comprises remnant manuka swamp and forest, and developed farmland.

Conservation Values:

Natural: abceh

Cultural: abce

Historic: b

Comment:

The headlands near Curio Bay have retained a high degree of naturalness - much *Anisotome lyallii* and *Myosotis rakiura* is present. Three yellow-eyed penguin nesting sites are known in the area, one in Porpoise Beach, one on the Curio Bay headlands (also a moulting site) where 2 pairs rest and one further to the east in Blue Cod Bay. Twenty five spotted shags are recorded as breeding near Flaxy Head. Pools of cetaceans are known to use the bay irregularly (hence its name), but nothing is recorded about this. Near Curio Bay is one of Dr Bill Ballantine's rocky shore monitoring sites.

At Curio Bay there is a petrified (fossil) forest. Where the sandstone strata has been cut back by the sea, broken logs and stumps have been exposed on the shore rock platform; a rich flora of fossil leaves is also present. The rock shelf constitutes the site of an ancient forest floor, from the Jurassic period 160 million years ago; this extends into the subtidal area. "Known fossil forests of this age are very few throughout the world and this is one of the most remarkable and varied of all," (SUC 1983).

This site has considerable use for school field trips. Porpoise Bay has traditionally been a small holiday crib settlement and is still used as such. The rocky coastline is quite spectacular to view. A number of Maori archaeological sites, (some as yet unrecorded) occur at the western end of the bay. They include middens and a burial site: The Star of Erin was shipwrecked on Otara Pt in 1884 (Ingram 1984).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The petrified forest is of international importance. The Maori burial is of regional significance (Karl Gillies, Southland Museum). Yellow-eyed penguins in the Catlins area are regionally endangered (DOC recovery plan draft) and rare (Bell 1986).

Existing Threats:**Type and Comment:** cdij

The prime threats are to the maritime communities from invasive plants and farmed animals. Boxthorn occurs at the northern end of Porpoise Bay, and marram and lupin is fairly widespread. Farm animals are able to wander freely on much of the coastal grass land communities although relatively little interference in the reserve has been reported. The threat of vandalism to the petrified forest is on-going. Dogs around the cribs and picnic area are a threat to the yellow-eyed penguins, when these are resting. There is a threat to the rocky subtidal communities from depletion of paua stocks because of commercial diving.

Human Modification and Human Use: ahi

Although not a large area, Curio Bay is used considerably for picknicking and sightseeing. Good picnic facilities are provided and the geologically and biologically interesting coastline attracts many visitors, as well as holiday makers using the cribs (baches) along Porpoise Bay. Swimming and fishing from the rocks, gathering shellfish and diving are also popular.

Inland the adjacent area is predominately developed farm land.

Existing Protection:**Type and Comment:** ai

1. Curio Bay Recreation Reserve - 10.28 ha comprising rock platform, low cliffs and level grassy land to the south of Porpoise Bay.
2. Curio Bay Scientific Reserve - 4.9ha which contains the fossil forest as well as many uncommon shore herbs.
3. Legal road along part of the headland to the west of Curio Bay.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:**Sources of Information:**

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	⑥	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff Brian Rance, Bob Morgan, Wynston Cooper and Pete McLelland contributed their experience. Karl Gillies (Southland Museum) is familiar with archaeological sites in this area. S. Dawson, (Zoology Dept, Canterbury University) provided information on Hector's Dolphin.

Recorded on Existing Databases: Comment: Blue Cod Bay site is recorded on SSWI

- 1 WERI
 - ② SSWI
 - ③ PNA
 - ④ Geopreservation
 - ⑤ HPT County Inventories (1986)
 - 6 Other
 - 7 None
-

Other Considerations:

Accompanying Maps and Photographs:

Site Names: The Reservoir/Haldane/Slope Pt

Site No: 140003

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 22060 53860

Date: 7 March 1990

Brief Description of Site:

This site extends from the Reservoir, a 40 hectare lake formed by dredging for gold and platinum, to Black Point. The Reservoir has been formed behind a series of sand dunes backing a sandy beach (Haldane Bay). The lake is fringed by flax and *carex* swamp, with coastal forest to the waters edge in places, but mainly pasture and tree lupin. Remnants of lowland forest podocarp also occur to the east, inland from the Slope Pt - Black Pt coast. The coast line here is rocky, a series of small bays and headlands with communities of coastal herbs, *Scirpus nodosus* and flax. Haldane estuary is 220 hectares in extent of which around 60% is mudflat at low tide. A fringe of jointed wire rush and *carex* separates the estuary from adjacent roads and pastureland.

Conservation Values:-

Natural: abcdfg

Cultural: c

Historic: abc

Comment:

The Reservoir retains a high degree of naturalness; from the adjacent forest remnant, there is an intact vegetation sequence into the lake itself, representative of lowland podocarp forest once typical of the district. Giant kokopu, a rare freshwater fish species occur in the Reservoir area (WINFD) (actual location needs checking).

The surrounding wetland fringe of the lake is recorded as providing good breeding cover for birds - in particular the flax/*carex* areas are excellent fernbird and crake habitat (SSWI). The WERI database recognises the diversity of habitats here, as well.

Yellow-eyed penguin resting sites are known from both Slope Point and the bay to the east (SSWI). Fur seals haul-out in this area occasionally. On the hill above Slope Pt itself is a site for the DSIR auroral camera. The point enjoys some fame as the most southern point of the South Island.

As a landform Haldane estuary is of regional importance (Geopreservation I.) Haldane Estuary is known as a breeding area for flatfish - flounders in particular (Otago Acclimitisation Society 1978) (WINFD). Ducks, swans, pukeko, herons and egrets are common in the area. It is also recorded as a black-backed gull breeding area (WERI).

The estuary has value as a landscape (WERI). Other cultural values are not recorded nor is any traditional use of the estuary which must have occurred.

Seven archaeological sites scattered along the shoreline and estuary mouth are Maori middens and ovens, including one with a moa bone recorded as being found in it (Williams 1983). Historic gold diggings associated with the Reservoir occur in the area, along with a historic marine beacon at Slope Pt (NZHPT).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The area's cultural value is of local significance only. Yellow-eyed penguins in the Catlins area are regionally endangered. The estuary and Reservoir are not of high regional significance as wildlife, waterfowl or fisheries habitat. Presence of the rare giant kokopu, makes this area of national significance (Williams and Given 1981).

Existing Threats:

Type and Comment: cdim

The dunes behind Haldane Bay have been invaded by marram and lupin and other introduced plants - little of the natural community has been retained. *Spartina* grass, in the Haldane estuary threatens its value as a habitat and nursery area for fish (pers obs). Around the estuary ongoing forestry/logging, and stock grazing is a threat to the native vegetation and birdlife of the area. At Slope Pt, the grazing of sheep with unrestricted access to the coast is damaging the coastal turf vegetation. Drainage is probably the biggest threat to the Reservoir and the existing wetland, as some is being developed for pasture. There is a threat to the rocky subtidal communities from the depletion of paua stocks due to heavy commercial diving pressure.

Human Modification and Human Use: ahi

Recreational use of Haldane estuary includes boating and yachting on the estuary, duckshooting, white baiting and floundering. The Waipahatu Stream and tributary supports a trout fishery. At Slope Pt, handgathering of shellfish, surf-casting and diving all occur. Farmland surrounds both the reservoir and the estuary (pers obs).

Existing Protection:

Type and Comment: adi

1. A marginal strip fronts private land along the coastline.
 2. Stewardship land includes the forest adjacent to the Reservoir.
 3. Haldane Recreational Reserve.
 4. Haldane Scenic Reserve.
 5. Haldane is zoned as estuarine in the district scheme
 6. Legal unformed road along the coast to the west of Haldane and also the Slope Pt area.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:

The cultural significance of the area may require further assessment. Field checks of natural values would also be worthwhile.

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with some experience of the area are Bob Morgan, Brian Rance, Pete McLelland and Wynston Cooper.

Recorded on Existing Databases: Comment:

①	WERI (1979)	The Reservoir and Haldane estuary are recorded on WERI; both these areas, the Slope Pt penguin colony and inland forest remnants are recognised as SSWI (1979). The Reservoir is mentioned in Wetlands of National Importance to Fisheries (1987) and the Freshwater Fish Database (1986). - landforms
②	SSWI (1979)	
3	PNA	
④	Geopreservation	
⑤	HPT County Inventories	
⑥	Other	
7	None	

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Waipapa Beach, Lake Brunton, Waipapa Pt

Site No: 140004

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 21960 53868

Date: 7 March 1990

Brief Description of Site:

Waipapa Beach, a sandy beach, 7.5km long and running roughly east-west, is backed by an extensive dune area. The western end in particular has a series of steep sided dunes, with damp dune hollows between. *Poa tridiodes*, *Coprosma acerosa* and pingao (threatened species) are present along with introduced marram. Lake Brunton, a small low-lying lake and wetland of around 50 hectares has been formed behind the dunes, as a result of dredging for gold and platinum. The lake has a wide variety of levels as the outlet is blocked (Otago Acclimatisation Society 1978). It is surrounded by flax and jointed wire rush/*Carex* wetland, then pasture land.

At Waipapa Pt to the east, the lower hill slopes above the beach have very floristically rich turf communities growing. This section of the coast has no proper dunes, but sand is blown directly from the beach onto the gentle coastal slopes, the upper areas of which are in pasture.

Conservation Values:

Natural: abcdg

Cultural: ae

Historic: bcd

Comment:

Pingao is still present over much of the dunes, including the area between Lake Brunton and the sea (Johnson, 1983). Banded dotterel (threatened) have been observed in the dunes (Rhys Buckingham 1987).

Lake Brunton contains a population of the rare giant kokopu (WNIF), it is also a feeding area for waders and wildfowl including herons, stilts and oystercatchers (WERI). A patch of pingao, approximately 60m² also grows at Waipapa Pt. This area is a type locality for the moths *Merophyas paraloxa* and *Protithona potamias* (B Patrick, DOC).

Sixteen archaeological sites are known along the shore and edge of Lake Bunton. The majority are Maori midden or oven sites (Williams 1983). Here also is the Waipapa lighthouse built in 1886 and now automatic (NZHPT). Its erection was sparked by the wreck of the Tararua on the reef off Waipapa Pt in 1881, one of NZ's worst shipping disasters in which 131 lives were lost. To the east lies the Tararua Halfacre, the cemetery in which the bodies recovered were buried. The wreck of the Tararua still lies off the reef; it is privately owned. Other earlier shipwrecks here were the Lunar in 1843 and William Ackers in 1876 (Ingram 1984). A derelict gold dredge lying in the dunes at the western end of the beach dates from a goldmining venture 1889-1895.

Traditional maori use of the area is not known. A number of schools regularly use the Waipapa Point shoreline for field trips.

Site Importance: International **National** Regional Local Unknown

Comment:

The wreck of the Tararua is probably of regional importance, as is the beach and dune area because of its naturalness and the pingao. However Lake Brunton mentioned in the Wetlands of National Importance to Fisheries because of the presence of the rare giant kokopu, makes this area of national significance.

Existing Threats:

Type and Comment: cdfim

The principal threats to Lake Brunton are drainage (m) and netting which may threaten the Kokopu population. Gorse also occurs on the inland side.

On the dunes marram dominates, especially the foredunes and continues to threaten the pingao. Gorse adjoins existing pasture land here. Grazing stock are a continued threat to the Waipapa Pt turf communities which are not fenced off from the pastureland (pers obs).

At present only a prospecting licence has been issued over Waipapa Beach.

Human Modification and Human Use: hik

A small commercial eel fishery has operated in Lake Brunton in the past. The main recreational use of the lake is duckshooting.

At Waipapa Pt picnicking, diving and swimming are popular. The lighthouse at Waipapa Pt is automatic.

Existing Protection:

Type and Comment: adi

- 1 Waipapa Pt Lighthouse Reserve.
 - 2 Waipapa Pt Recreation Reserve - 21 ha.
 - 3 Marginal strip along the coastline fronting freehold land.
 - 4 From Waipapa Pt to Howells Pt (Riverton) commercial shellfish and kina take is prohibited.
 - 5 Legal unformed road along east end of beach.
-

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with experience of this area are Bob Morgan, Wynston Cooper, Pete McLelland and Andy Cox. B Patrick DOC Dunedin provided information of coastal invertebrates.

Recorded on Existing Databases: Comment:

- Lake Brunton is recorded in the WERI database (1979) and in the Wetlands of National Importance to Fisheries (1987) and SSWI (1979).
- 1 WERI (1979)
 - 2 SSWI (1979)
 - 3 PNA (1984)
 - 4 Geopreservation
 - 5 HPT County Inventories (1986)
 - 6 Other
 - 7 None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Lake Vincent/Frasers Beach

Site No: 14005

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 21905 53915

Date: 7 March 1990

Brief Description of Site:

This site stretches northward from Lake Vincent to Waipapa Pt (site 4) to Lake Vincent. Frasers Beach a steep gravel shore 3.5km long, with a small area of foredure at the south-eastern end, lies in a half-moon shaped bay to the south of the lake. Backing the beach, the cliff top has a *Hebe elliptica* dominated shrubland and in places windblown sand and coastal turf and sedge communities (Johnson, 1983). South from Frasers Beach the rocky shoreline is based by low cliffs and pastureland.

Lake Vincent, 20 ha in extent is long and narrow with several small arms. It is surrounded by raup swamp and developed pastureland. The lake is of cultural origin formed by dredging for gold and platinum. Two further lakes formed by dredging Lake Charles and Lake Forest lie around km inland from the coast near Otara.

Conservation Values: **Natural:** bcde **Cultural:** e **Historic:** ab
Comment:

Along this coastline, thin gravel, dune sand loess and peatysoil deposits form cappings on many of the exposed rocky cliffs. These deposits are from Quaternary terraces and are of geological interest (Lindquist, 1988).

At Frasers Beach, although marram dominates the back beach and small dunes, some pingao is still present (Johnson 1983). Lake Vincent is an ideal loafing and feeding area for all types of waterfowl (SSW1). Ducks, pukeko, swan and at times Canada geese, white-faced heron, stilts and oyster catchers are present (Otago Acclimatisation Society 1978). A population of the rare kokopu occurs in the lake (WNIFD) as do perch and eels (Otago Acclimatisation Society Submission 1978).

The shore adjacent to Lake Vincent is used by school groups on coastal field studies (Paul Gay, pers comm) and Fortrose school uses the eastern side of the estuary regularly. Two Maori middens are known from this coast (NZHPT); Lake Vincent has historical interest because of the mining which formed it. Other traditional uses of this area are not known (WERI).

Site Importance: International **National** Regional Local Unknown
Comment:

Lake Vincent is listed in the Wetlands of National Importance to Fisheries database because of the giant kokopu and the eel fishery. The Quaternary terraces are of regional significance.

Existing Threats:

Type and Comment: cfim

Lake Vincent is exposed to the threat of drainage. In addition the commercial eel fishery could threaten the giant kokopu population. The drainage of the surrounding wetland is a threat to the area's value as a habitat.

Mining of gravel is currently carried out at Frasers Beach; lupin, gorse and marram have invaded the dune area here. There is a threat to the rocky subtidal communities from the depletion of paua stocks due to heavy commercial diving pressure.

Human Modification and Human Use: ahi

Atop the cliffs along this shore, the coastline has been developed for pastoral use. Lake Vincent has been extensively grazed to the waters edge. Eels in the lake have been substantially reduced by commercial netting (WNIFD). The lake is used for duckshooting, and when Fortrose estuary is unsuitable, it is an alternative waterskiing site.

A pingao replanting programme is about to begin on the small beach near Lake Vincent.

Existing Protection:

Type and Comment: d

Under Fisheries regulations this area is closed to commercial shellfish and kina take.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff who contributed field experience were Brian Rance and Bob Morgan. Identification of educational sites by Paul Gay, Scientific Adviser, Ministry of Education.

Recorded on Existing Databases: Comment:

- Lake Vincent is recorded both in WERI 1980 and the Wetlands
of National Importance to Fisheries database (1987) and SSW1 1980.
- ① WERI (1980)
 - ② SSWI (1980) Small Otara Swamp. 1.5 km inland - SSWI (1980)
 - 3 PNA
 - 4 Geopreservation
 - ⑤ HPT County Inventories
 - ⑥ Other
-

Site Names: Fortrose Spit/Toetoes Harbour

Site No: 14006

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 21865 53960

Date: 7 March 1990

Brief Description of Site:

The Toetoes Harbour covers 600 ha including 2.8km² of estuarine mudflats. It is fed by both the Mātaura and Titiroa Rivers which meander across an extensive coastal plain pasture and wetland. The Mātaura's catchment is the largest in Southland (except the Waiāu) and covers 5360km². To the south of the estuary is the Fortrose spit (9 km long); the rivers enter the sea at its eastern end opposite Fortrose township. The right angled bend in the lower Mātaura attests to the strength of the eastward longshore drift and current through Foveaux Strait. The mudflats are fringed with jointed wire rush and flax swamp. Along the edge of the Mātaura River are areas of saltmarsh turf, and on the north side of the harbour, a wetland community on the flood plain. At the western extremity of the spit is a remnant peatland with pygmy pines (Rance pers. comm.). To the west the Fortrose Spit has coarse sand, and a low narrow dune, to the east the sand becomes progressively finer and the dunes higher. A steep seaward slope exists at the estuary mouth. The Mātaura River entrance has been diverted 5km eastward by the eastward growth of the spit.

Conservation Values: Natural: abcdh

Cultural: ac

Historic: bcd

Comment:

On the extensive dune area of the Fortrose Spit grows abundant pingao, (threatened); the threatened native dune sedge *Poa tridioides*. Other native dune species are also present, as is the introduced marram (Rance 1988). Towards the west eroded sand plains are partly covered with the uncommon *Raoulia* sp. aff *hookeri* community containing *Ranunculus recens*. The spit has been identified as one of the key sites in Southland for coastal invertebrates (B Patrick pers. comm.). Ventifacts are scattered along the coast, but not in the concentrations found in the Bluff/Greenhills/Awarua Bay area Beck (pers comm). The wetland community to the east of the Mātaura still retains a high degree of naturalness, as does the spit. The rare giant kokopu are reported from the vicinity of Fortrose (actual location needs checking). Twenty-one bird species, a mixture of bush birds, waders and waterfowl including the banded dotterel (threatened) are found in this harbour (SSWI). The harbour is also a rearing area for marine fish, particularly flatfish. Eighteen species of fish have been recorded, including giant kokopu. The lower reaches of the Mātaura river are a rearing area for adult brown trout and large numbers of whitebait spawn in both rivers (WNIFD). The harbour is one of the five Southland estuaries which together form one of the five most important wading bird habitats in NZ (W Cooper pers. comm.). It is also the site preferred by Far Eastern Curlew when the nearby Waituna lagoon is closed to the sea.

The harbour has cultural value both for its landscape (WERU) and for its traditional Maori use (Davis pers. comm.). It is one of the taiahere sites proposed in Southland by the tangata whenua which reflects this use. Seven archaeological sites have been found around the harbour entrance and along the spit - these are principally middens and findspots of Maori origin. A short-lived shorewhaling station operated in the harbour in 1835-36, one of several along the southern coast (Hall-Jones, 1979, Williams, 1983).

The Iona was wrecked in the harbour near Fortrose in 1886 (Ingram 1984).

John Boulton records that around 1826 Toetoes village kaika was situated on a large plain, on the side of a river, the entrance to which was over a bar. About 45 large and apparently ancient houses were here. There was a large potato garden.

Site Importance: International National Regional Local Unknown

Comment:

The estuary and tidal reaches of the Maitara and Titiroa Support a whitebait fishery of national importance; the Maitara is also a nationally important brown trout fishery. The Wetlands of National Importance to Fisheries database gives the area an outstanding rating. It also ranks as nationally important as an integral part of the complex of Southland estuaries which form the most southern feeding grounds for waders including transequatorial migratory species (SSW1).

Existing Threats:

Type and Comment: acdfm

The Southland Regional Council's flood locks on the lower Titiroa stop the upstream migration of whitebait seeking spawning areas (DOC field centre staff pers. comm.). Flooding occurs regularly. Farm development of marginal areas, grazing of stock including cattle, and the drainage of wetlands is altering the vegetation fringing the harbour. The Spit is prograding; DOC is actively managing weed species - marram, lupin, and gorse and is replanting pingao. The rabbit population on the spit is threatening native vegetation (Rance pers. comm.). Mining is currently occurring on the seaward (Toetoes) Beach.

Human Modification and Human Use: ahik

The Maitara and Titiroa Rivers are important whitebait and trout fisheries; 250 plus whitebait stands have been built in the lower reaches of these rivers (DOC staff pers. comm.). Boating, flounder fishing, birdwatching, waterskiing, shellfish gathering, duckshooting, eel spearing and netting all occur in this area (Otago Acclimatisation Society submission 1978). Commercial trawling occurs in Toetoes Bay. To the west of the estuary and spit, land down to the shore has been developed for pasture land as has that around the lower reaches of the rivers.

A pingao replanting programme is planned for the spit. Beside the river on the rear of the dune system is a collection of whitebaiters huts.

Existing Protection:

Type and Comment: adi

1. Most of the spit is stewardship land.
 2. Toetoes Harbour is zoned estuarine in the District Scheme.
 3. Legal unformed road along the western coastline.
 4. Under Fisheries Regulation's this area is closed under to commercial take of shellfish and kina.
-

Availability of Information:

Natural	①	2	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general)
Threats	1	②	3	3 Little information (if any)
Human Mod. & Use	1	②	3	

Comment:

Further research into traditional uses of the harbour area and spit is required.

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	⑦	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	⑦	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Brian Rance and Bob Morgan, local DOC staff are familiar with the coastline, P McLelland and A Cox with the whitebait fishery. B Patrick, DOC Dunedin, provided information on coastal invertebrates. Archaeological evidence was provided by R Beck, Southland Museum and information on taiapure proposals by Davis, MAFFish, Dunedin.

Recorded on Existing Databases: Comment:

①	WERI (1980)	Toetoes Harbour, the spit and an adjacent bush remnant are recorded
②	SSWI (1980)	as SSWI (1980).
3	PNA	
4	Geopreservation	
⑤	HPT County Inventories	
⑥	Other	(Wetlands of National Importance to Fisheries 1987)
7	None	(Freshwater Fish Database, MAF 1986)

Site Names: Waituna/Seaward Moss/Awarua

Site No: 14007

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 21710 53970

Date: 8 March 1990

Brief Description of Site:

This site includes a freshwater lagoon, 9km long impounded behind the coast by a gravel bar or in places on eroding peat bank. The lagoon is flanked by peatbogs to the south and east including 2240ha of the Seaward Moss area and to the west by the Awarua Plains swamp (17680ha), all part of this site. The lagoon is mostly less than 2 metres deep and is open to the sea only periodically; when the outlet is closed the water level and temperature tend to rise; when the outlet is open the lagoon is tidal. The lagoon is fringed by a *Leptocarpus* fringe. A turf of mat-forming herbs grows on gravel and mud around the lagoon where it is alternately submerged and exposed. The adjacent Waituna-Seaward Moss - Awarua area is an extensive wetland with a range of community types including red tussocklands, *Empodisma minus* rushland, manuka, shrubland and tarns and cushion bogs.

The narrow gravel beach ridge is composed of small quartz pebbles, bare on the seaward site, partly vegetated with a sub-shrub turf community on the backslope. The ridge is growing westward largely due to its mid-bay position under the influence of periodic strong SE storm waves and possibly a nearshore eddy current engendered by the Southland Current. (Mutch and Liggett 1985).

Conservation Values:

Natural: abcdefgh

Cultural: ace

Historic: b

Comment:

This large reserve and Seaward - Moss to the east are still in a largely natural state and are representative of Waituna Ecological District (DOC 1987). Botanically the reserve is unique; this peat bog on the sea coast contains many plants usually found at higher levels - a unique moor-like vegetation characterised by herbs and shrubs adapted to cold peaty conditions (PNA) 1984. An unusual and localised community of mat cushions of *Raoulia* sp aff *hooteri* grows along the gravel ridge. A few plants of the threatened pingao grow near the old lagoon opening at the eastern end (Rance pers. comm.).

The area is a stronghold for many wetland birds including the SI fernbird, Australasian bittern and spotless and marsh crakes that are disappearing elsewhere, and is an important summer refuge for migratory waders from the northern hemisphere (Otago Acclimatisation Society submission 1978). The lagoon is an important component of the five Southland estuaries that together form a very important, and the mostly southerly wading bird habitat in New Zealand (Cooper pers. comm.). Seventy-three bird species have been recorded. It is the principal black swan habitat and breeding area in Southland, and is also a breeding area for Canada Geese (SSWI). Wader roosts used are the shingle bar and mudflat areas adjacent to the outlet. In late spring to early autumn many migratory waders feed here, including the occasional rare grey plover. Little black shags breed on *Carex* stumps in the peatlands. The wetlands are also a key site for invertebrates (Patrick pers. comm.). Late Quaternary low terrace deposits occur along the coast. A remnant of an old shoreline is still preserved along the inner margin of Waituna Lagoon at its eastern end where a "dead" sea-cliff composed of unconsolidated quartz gravel rises about 15ft above high water level (Cullen 1967). The Ashers - Waituna Lignite field extends in the subsurface south to Waituna Lagoon, (Ecology Division DSIR, (1985). Ventifacts are scattered along the coastline (Beck, pers. comm.). The lagoon supports a large population of sea-run brown trout and its tributaries provide extensive trout spawning gravels. It also contains populations of the rare giant kokopu, banded kokopu, inanga, eels and other estuarine and freshwater fish species (WERI). Several of Tiwai aluminium smelter's fluoride monitoring sites occur around the lagoon.

Only two archaeological sites are known, from the western end, one a findspot, the other a Maori oven (Williams 1983). However the lagoon is one of the taiapure areas proposed by the tangata whenua, which reflects its traditional use for fishing (Davis pers comm.). The wetland area is regularly used for education purposes, usually for either botanical or ornithological reasons. Locally this area is very scenic but not seen as a landscape except from the air.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The Scientific Reserve is regarded as one of the most significant in NZ; it has been designated under the IUCN Convention on Wetlands of International Importance especially as waterfowl habitat. The lagoon has been ranked by the Wetlands of National Importance to Fisheries as outstanding.

Existing Threats:

Type and Comment: cfk

The gravel bar impounding the lagoon is breached by bulldozer when the lake reaches a height of 2m on the Currans Creek Bridge; guage opening of the lake is supervised by the Lake Waituna Control Association. Parts of the wetland area have been damaged by fire, an ongoing threat (Cooper pers comm). Woody weed species currently being managed are gorse and broom, localised spanish heath, blackberry, tree lupin and wilding pines. On the coast marram and angelica are threats to coastal vegetation (Rance pers comm.). In places black-backed gulls are having a detrimental threat on the cushion bogs (Rance pers comm). Mining occurs on the beach. Motorbikes are damaging the wetlands in places.

Human Modification and Human Use: fhij

The lagoon is a popular trout fishing and duckshooting area. A number of users have huts squatting on the reserve DOC (1989). This area is also used for educational visits, ornithology and botanizing; minor recreational fisheries in the lagoon are floundering and whitebaiting. This area is also the subject of a taiapure proposal.

Existing Protection:

Type and Comment: adi

1. Waituna Lagoon Scientific Reserve - 3557 ha including lagoon and surrounding wetlands.
 2. Waituna Scenic Reserve - 56ha of swamp forest and peat bog, the only such reserve in the district, lies to the north.
 3. Under Fisheries Regulations the coast is closed to the commercial take of shellfish and spartina.
 4. Seaward Moss is stewardship land.
 5. Legal unformed road along part of the coast.
 6. The lagoon is zoned estuarine in the District scheme.
-

Availability of Information:

Natural	①	2	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	①	2	3	3 Little information (if any).
Human Mod. & Use	①	2	3	

Comment:

The natural values are well documented and appreciated but this is virtually no information on historic or cultural values other than present uses.

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with experience of the area are Brian Rance, Andy Cox and Wynston Cooper. Advice on other topics as indicated; invertebrates - B Patrick, DOC, Dunedin
 taiapure - K Davis, MAF, Dunedin
 archaeology - R Beck, Southland Museum

Recorded on Existing Databases: Comment:

①	WERI	Also SSWI are Cooks Bush 65ha of podocarp forest and Lawson Road Bush (85ha) and other small areas further north of the existing reserves.
②	SSWI (1988)	
③	PNA	
4	Geopreservation	
5	HPT County Inventories	
⑥	Other	(Wetlands of National Importance to Fisheries 1987)
7	None	(Freshwater Fish Database, MAF)

Site Names: Catlins Coastal

Site No: 140008

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47 G47 22040 53850

Date: 10 March 1990

Brief Description of Site:

This site extends westward from Waipapa Pt to the Brothers Pt. Landward it abuts sites (1-4) at MWL and seaward it extends to the edge of the Eastern Foveaux Shelf.

Conservation Values:

Natural: e

Cultural: -

Historic: d

Comment:

Little is known of the marine conservation values of this area.

At Curio Bay, the fossil forest exposed in the intertidal extends subtidally. This forest, with in-situ stumps, broken logs and a rich flora of fossil leaves, is an ancient forest floor from the Jurassic period, 160 million years ago (Geopreservation index).

Porpoises are reported to visit Porpoise Bay area every year at Easter and to remain until Labour Weekend. Their type is unknown. The type of dolphin/porpoise is unknown from these reports. However Dawson (pers. comm.) has counted approximately 12 Hector dolphins which use this area.

Off Waipapa Pt lies the wreck of the Tararua (NZHPT), lost in 1881 in one of New Zealand's worst shipping disasters. One hundred and thirty-one lives were lost (McIntosh).

Economic stocks of crayfish, paua, octopus, blue cod and groper are reported from this area. (King et al 1985).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

Existing Threats:

Type and Comment: i

Trawling is reported to occur in this area (Tortell 1981). The depletion of paua stocks by commercial divers is of serious concern, as along much of Southland and Stewart Islands rocky shore areas. (Meeting of Recreational Fishermens Association, Invercargill, March 1990). This merits further investigation (personal observations).

Human Modification and Human Use: i

The area is known to hold economic stocks of crayfish, paua, octopus, blue cod and groper. Commercial fishing activity centres on crayfish potting, paua diving and coddling. Recreational diving at Waipapa Pt. is popular; other areas used are around Curio Bay and the Slope Point area. Amateur fishing is primarily for paua, surf casting for kahawai and blue cod fishing.

Existing Protection:**Type and Comment:**

None.

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:**Sources of Information:**

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Further search for scientific work relevant to this area is merited.

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- 5 HPT County Inventories Tararua
- 6 Other
- 7 None

Data on Hector's dolphin was supplied by S Dawson, Zoology Department, Canterbury University.

Accompanying Maps and Photographs:

Site Names: Toe toes Coastal/Dog Island

Site No: 140009

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E47 21580 53900

Date: 10 March 1990

Brief Description of Site:

This site extends from Waipapa Pt in the west to Tiwai Pt. Seaward it is bound by the Foveaux Strait shelf. Dog Island 6km off Toetoes Bay is a small flat island, dominated by the tall historic lighthouse.

The coastline consists of sections of sand, gravel, cobble and boulder beaches (sites 5, 6 & 7). There is a dominant eastward longshore drift; the Southland Current flows eastward through Foveaux Strait. Periodic high southeast and southwest directed storm waves occur. Local progradation is evident along the shore by the development of a series of shingle and sand spits and a bay mouth bar with steep seaward stopes where rivers drain into the sea at Fortrose.

Conservation Values:

Natural: e

Cultural: ac

Historic: bcd

Comment:

Little is recorded of the marine conservation values of this area. Dog Island is probably largely modified because of human activity (personal observation). The Geopreservation Index records a sample of submarine lignite recovered from 9 fathoms depth in Toetoes Bay. The sample illustrates tectonism and sea-level rise since early quaternary time. It is possible that the Waimatua lignite field near Waituna extends subtidally across Foveaux Strait. Ventifacts are occasionally dredged up in this area.

The prominent lighthouse on Dog Island was constructed in 1864 (NZHPT). Also still standing is the original keepers house. There are several important Maori archaeological sites on the island but many of these sites have been partially destroyed (Williams 1983). The sites include a source of rock for stone tools, a flaking floor and associated occupation sites. The wreck of the Waikouaiti lies off the island; this steamer foundered in 1939 (Ingram 1984). Along Toetoes Bay an outrigger float from a Maori canoe has been recovered; this is now in the Southland Museum (Karl Gillies pers. comm.). This area is an important seascape highly visible from the Bluff Hill lookout.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

Existing Threats:

Type and Comment: im

Trawling occurs in Toe toes bay. Much of the archaeological site material on Dog Island has been destroyed (Williams 1983).

Human Modification and Human Use: k

The Dog Island lighthouse is now automatic. Fishing occurs in this area.

Site Names: Tiwai/Awarua Bay

Site No: 140010

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E47 21610 53394

Date: 8 March 1990

Brief Description of Site:

This site comprises Awarua Bay, a long estuarine arm at the eastern end of Bluff Harbour, Tiwai Peninsula on the seaward side of the bay and the Awarua Plains to the north of the bay. Along the Peninsula are extensive red tussock lands on a sandy substrate. Adjacent to the coast are rich turf communities. A sandy beach, part of Toetoes Bay extends 12km eastward to Waituna, and is backed by low dunes covered by marram with *Raoulia* sp. aff. *hookeri* and a variety of other native plants. Awarua Bay which covers 2080 ha runs parallel to the coast. The peninsula is fringed by a narrow band of jointed wire rush (WERI). Other saltmarsh areas are scattered along its coast and on the small islands.

No major river enters the bay (nor Bluff Harbour). The Awarua bog to the north and west is part of the Waituna wetlands site. The most prominent feature of this area is Comalco's aluminium smelter on Tiwai Pt; the adjacent wharf and the causeway which crosses Awarua Bay.

Conservation Values:

Natural: abcdefh

Cultural: abce

Historic: abcde

Comment:

Red tussock lands on the peninsula are little modified except at the western end where they have been developed for pasture.

Concentrations of *Olearia nummularifolia* a normally sub-alpine shrub, and the southern limits of a number of species (eg *Aciphylla glaucescens* and matagouri), along with regenerating forest species and Halls totara on the dunes make this an interesting biological community (Timmins et al 1986). The bay and peninsula is also a key site for coastal invertebrates, including cushionfield moths. Of special interest is the recent discovery of the snail *Thalassiahelix obubila* on Tiwai Point which was previously thought to be endemic to Stewart Island (B Patrick pers comm). Three species of skink are found here *Leiopisma nigraplantare-polychoma*, *L inconspicum* and *L chloronoton*. Along the peninsula are found Australian bitterns, SI fernbirds, and on the coast banded dotterels and variable oyster catchers, all of which have a recognised conservation status.

Awarua Bay has the second highest wading bird population in Southland (Cooper pers comm). The head of the bay is an important habitat for transequitorial migrants such as the rare siberian tattler, sanderling and grey plover (SSWI). The south side of the bay is regularly visited in autumn and winter by the threatened NZ dotterel. The PNA register (1984) also records white fronted and caspian terns (threatened) in this area. The bay is an important component of the complex of 5 southern estuaries used by waders and waterfowl. At Tiwai Point itself there is a large breeding colony of the rare Stewart Island shags (Cooper pers comm).

The area has good examples of late Quaternary (Holocene) low terrace deposits (Awarua Bay) (Lindquist 1988); along the peninsula are numerous parallel "storm-beach gravel ridges (Mutch & Liggett 1985). Vegetation covering these ancient dune systems is primarily red tussock grassland, which is interspersed in places with flax and shrubland communities (the composition of which varies with locality). On the southern side of the peninsula is a coastal turf community. This forms a narrow band 20 - 50 m in width and several kilometres in length and is notable for the diversity of grass, shrub and herb species which comprise the community (B Rance, pers. comm.).

Existing Protection:**Type and Comment:** d

From Howells Pt to Waipapa Point is closed to the commercial take of shellfish and kina under Fisheries Regulations.

Availability of Information:

Natural	1	2	③	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:**Sources of Information:**

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Further search for scientific work relevant to this area is merited.
Karl Gillies HPT Site Record Keeper Southland Museum

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- ④ Geopreservation
- ⑤ HPT County Inventories - Dog Island
- 6 Other
- 7 None

Accompanying Maps and Photographs:

Ventifacts along the northern edge of Awarua Bay are several thousand years old (R Beck pers comm). Historically the Bay and Peninsula are part of a larger area including Bluff and Greenhills which was used extensively by both Maori and European (Hall-Jones 1979). The significance of the area centres on the outcrops of black argillite around the Bluff foreshore, which was used for the manufacture of stone tools and the associated workshops and occupation sites flaking floor sited where the smelter now stands (Williams 1983). Artefacts from this area have been found throughout Otago and Southland. Oven and midden sites are scattered along Awarua Bay and there is a burial in the area (NZHPT).

The Tiwai Pt area was the site of an early shore whaling station in the 1830s. From 1858 it was used as an immigration station and quarantine area; for these purposes a hospital was built in 1900. Of this and other European houses and several shipwrecks which have occurred on the point, nothing is known to remain (Hall-Jones 1979).

Part of Awarua Bay is regularly used by schools for estuarine field trips. The seaward area, in particular retains a wild aspect and all the site has landscape value. This site has moderately high conservation values.

Site Importance: International National Regional Local Unknown

Comment:

Historically this area is of national importance (Karl Gillies, Southland Museum). Being part of the complex of 5 Southland estuaries, and having a high use by migratory waders it is biologically also of national importance.

Existing Threats:

Type and Comment: cefjm

Awarua Bay - water pollution from industrial wastes - eg on Tiwai Peninsula is sited the toxic waste dump for the smelter from which there have been leaking problems in the past (Cox pers com). There is also a firebrick tip. The smelter itself also emits SO₂ and flourides; the prevailing wind direction is down the peninsula. Major weed species threatening native vegetation on the peninsula are gorse in the tussock and grassland and marram along the beach. Other weed species present include broom, blackberry, ragwort and lupin. *Spartina* in Bluff estuary is a potential threat to Awarua Bay (Rance pers com). Black-backed gulls have proved a threat to tern colonies along the spit (Cooper pers com). The smelter itself is a large complex, which when it was built was located on the site of an argillite workshop historically used extensively by Maoris (Williams 1983). Mining of the beach/dune area has occurred and some extensive borrow pits and bulldozed tracks are present (Cooper pers com).

Human Modification and Human Use: ahij

Awarua Bay was one of the tangata whenua's traditionally used estuaries, probably for kaimoana (Davis pers com). The largest modification to the area comes from the smelter and associated activities including the sewage outfall and the causeway across Awarua Bay which provides access. The western end of the peninsula is modified somewhat by farming. Uses of the area centre on water-based recreational activities such as yachting, windsurfing and sailing. Birdwatching and some duckshooting occurs. Scuba diving occurs at Tiwai Pt; access to the south coast is through the smelter grounds and can be restricted.

Existing Protection:**Type and Comment:** adf

1. Tiwai Island - Wildlife Management Reserve.
 2. Joey Island Scenic Reserve - a small rather narrow island on a flat gravel bar in the eastern entrance of Awarua Bay (11.4 ha) is controlled by the Bluff Community Board (DOC 1989).
 3. Awarua Bay wildlife refuge - 9.3 ha - habitat for white fronted and Caspian Tern NB PNA register notes that there is insufficient control over habitat. Private land - (Andy Cox pers com).
 4. Much of Tiwai Peninsula is stewardship land leased to NZAS.
 5. The outer coast is closed to the commercial take of shellfish.
 6. Awarua Bay is zoned estuarine in the District Scheme.
-

Availability of Information:

Natural	①	2	3	
Cultural	1	②	3	1 Well documented
Historic	1	②	3	2 Limited information (general)
Threats	1	2	③	3 Little information (if any)
Human Mod. & Use	1	②	3	

Comment:

Nothing is documented about the fisheries value of Awarua Bay.

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	⑦	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	⑦	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Brian Rance, Wynston Cooper and Andy Cox are the local DOC staff with experience of this area. Traditional (Maori) food gathering information was provided by Kelly Davis MAF, archaeological advice by R Beck, Southland Museum.

Recorded on Existing Databases: Comment:

Awarua Bay is a SSWI

- ① WERI
 - ② SSWI (1980)
 - ③ PNA
 - 4 Geopreservation
 - ⑤ HPT County Inventories
 - 6 Other
 - 7 None
-

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Bluff/Omaui

Site No: 140011

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E47 21500 53945

Date: 8 March 1990

Brief Description of Site:

This site includes all of Bluff Harbour except Awarua Bay (adjacent site), also the outer seaward coastline from the harbour entrance around Bluff Hill to the beach dunes at Omaui, the entrance to the New River estuary. There is no major river running into Bluff Harbour. Although the area does not have a history of large scale reclamation, the "old wharf" and commercial Island Harbour area have been developed on reclaimed land.

Much of the harbour is unmodified and estuarine; at low tide 30% of the 3360 has are mudflat and 30% seral rush fringe. Bluff Hill a prominent land mark at the entrance to the harbour is joined to mainland by a narrow tombolo at Ocean Beach. The rocky coast to Omaui is exposed, with small areas of sand dunes blown inland up hill slopes and gullies. This peninsula was once covered with coastal podocarp forest and remnants remain. Between Bluff Harbour and the Mokomoko Arm of New River is a low lying swamp area only 2km wide.

Conservation Values:

Natural: abcdefghi

Cultural: abcde

Historic: abcde

Comment:

A relatively unmodified remnant of once more widespread coastal podocarp forest is found in a gully on the south-eastern end of Bluff Hill (DOC 1989). In this area, intact vegetation sequences exist from shore to summit (Rance pers comm). At the southern end of the reserve is an area of low heath and scrubland which has been induced by fire. Adjacent to this on the south-west side of the hill are peat and swampy habitats supporting many uncommon plants including the sundew *Drosera pygmaea* (DOC 1989). This area is also the eastern limit of *Olearia angustifolia*, *Brachyglottis rotundifolia* and *Drapetes yallii*, it is also the type locality for *Epilobium komarovianum*, *Euphrasia repens* and *Carex fretalis*.

At Lookout Pt 1-2 pairs of yellow-eyed penguins are known to breed but not in the last 2 years (McClelland pers com). This area is also used for monitoring fluoride emissions from the Tiwai smelter (Rance pers com) and is also a key coastal invertebrates site for coastal turf and shrubland moths (B Patrick pers com). The windswept islets in Bluff Harbour are known nesting sites for Stewart Island shags (SSWI). Several areas are of geological interest including the tombolo connecting Bluff and Flat Hills, also extensive coastal exposures from the Permian period of ultramafic and granitic igneous rocks. Intertidal exposures of Permian metasediments containing diverse marine trace fossils occur at Green Pt and Colyers Is. At Stirling Pt a small area of Oligocene shelly conglomerate exposed on a coast is the only such area known in a coastal site (Lindquist 1988). All the Bluff Harbour area is rich in ventifacts (Russell Beck pers comm). Whilst Bluff harbour has extensive low tide feeding areas for waders it is not as well used as New River or Awarua Bay nearby. Fisheries values are barely documented; there is a record of the occurrence of the rare giant kokopu in a tributary at the head of Bluff Harbour (FFD). Of the small dunes between Lookout Pt and Omaui, the Three Sisters is the most notable. Present are pingao (rare) and a population of the world's rarest plant in the wild *Gunnera hamiltonii* (endangered) and other typical dune species (Rance 1987). Ventifacts and moa bones are known from this site (Beck pers com). Yellow-eyed penguins are known to come ashore on the nearby coast; breeding status is uncertain (McClellan pers com). These dunes are also a type locality for the moth *Asaphodes stephanitis*, (B Patrick pers com). On the islets at Omaui little blue penguins and sooty shear waters breed (McClelland pers com). The Omaui Scenic Reserve is another remnant of this once more widespread forest which once occupied the Southern coastline (DOC 1989).

Nearly 40 archaeological sites are known throughout this area (including Dog Island); it is part of a larger area, including Tiwai which was used extensively by the Maoris (see site record sheet Tiwai/Awarua) (Williams 1983).

The Bluff/Stirling Pt area has historic, European values, as one of the oldest settlements in New Zealand; also because of the early shore whaling and latter fishing activity (Hall-Jones 1979). Off the many ships that were wrecked within Bluff harbour and at the entrance to both it and the New River estuary at Omaui, the only known remains are England's Glory at the start of the Glory Track, and one buried in the sands off Omaui (Ingram 1984). The wreck on Tikore island is that of a whale chaser used in the Ross Sea by a Norwegian company in the 1930s. Off Barracouta Pt is the Olivia, a recent fishing vessel. Also at Omaui is a historic marine beacon and sites associated with early Maori occupation; an ancient Kaika was sited there and later European activities such as shore whaling in the 1830s.

The landscape context of the harbour is semi-cultured (Southland United Council 1989); despite development the area has considerable value, aesthetically and as a landscape (pers obs). There is a well used lookout on top of Bluff Hill (field centre staff pers com). Constantly changing light qualities in Bluff Harbour contribute significantly to the character of the Inlet (SUC 1979). Bluff Harbour is also used by schools and Omaui are also used by schools for seashore field studies. The outer coast from Omaui to Bluff has traditionally been used for fishing and shellfish gathering; both Bluff Harbour and from Bombay Rock at Omaui to Tiwai is a proposed rahui area (Davis pers com). The ancient kaika at Omaui has spiritual as well as historic and traditional significance. It is associated with the legend of Maui, who pulled Stewart Island from the sea here, to act as an anchor for the canoe of Aoraki.

Site Importance: **International** National Regional Local Unknown

Comment:

Most of this area is of national importance because of the high historical, and historically based cultural values, (Williams 1983), the geological values including the ventifacts, and the presence of pingao on the dunes. However, on the Three Sisters dune near Omaui, there is a small area (4 m²) on which *Gunnera hamiltonii* an endangered endemic species still survives in the wild. As a result, this site has been assigned international importance.

Existing Threats:

Type and Comment: bcdegkl

The prime threats to Bluff Harbour are siltation the presence of *Spartina* the estuary, and industrial and agricultural pollution. The foreshore has been altered in the vicinity of the port area. Shore stabilisation on the western side of the harbour is affecting natural sedimentation processes (pers obs). Ocean Beach freezing works has an outfall both into the harbour and onto the west coast. On Bluff Hill, old man's beard, gorse, broom, blackberry occur, and sheep graze to the coast. On the Three sisters dunes the prime threats to native vegetation are marram, lupin and goats which graze the dune. Grazing is reported to keep the spread of marram in check (Johnson 1983). The Omaui dunes are extensively covered with marram, but still have value in coastal sediment transport which is occasionally threatened by motorbikes destroying the vegetation cover.

Concern has been expressed by local tangata whenua that the paua stocks in this area are becoming depleted. This has also been a topic of discussion of a recent meeting of the local recreational fishermen's association (Pillai pers com).

Comment:

Field checks were made at Three Sisters Dunes and western portion of Bluff Harbour. There is little information on the natural values of Bluff Harbour.

Invertebrate data - B Patrick, DOC, Dunedin

Cultural values - Russell Beck and Karl Gillies, Southland Museum

Traditional fishing areas (Maori) - Kelly Davis, MAF, Dunedin

Other information was provided by DOC field centre and conservancy staff, Invercargill. P McClelland
A Pillai

Recorded on Existing Databases: Comment:

- The PNA register does not contain reference to the Bluff Scenic Reserve.
- | | |
|---|---------------------------------|
| ① | WERI |
| ② | SSWI |
| ③ | PNA |
| ④ | Geopreservation - Land forms |
| ⑤ | HPT County Inventories |
| ⑥ | Other |
| 7 | None \ Freshwater Fish Database |

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: New River Estuary/Sandy Point

Site No: 140012

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E47 21510 54050

Date: 9 March 1990

Brief Description of Site:

At 4250 ha, New River is the largest Southland estuary. Into it flow the Oreti with a catchment of 3510km², the Waihopai and several creeks. The length of tidal waters is approximately 65km. Invercargill city is sited on the northern edge and Otatara suburb is to the west. Extensive reclamation has occurred around the northern estuary edge. Several major sources of pollution are present including the city tip and sewerage treatment plant. Also part of the estuary is Mokomoko Inlet (210ha) in the south. The entrance is 1200 metres wide, across this is a large central unstable sand bar, near Omaui; tidal flows are strong. The way this entrance is tucked in close to the margin of the coastal promontory here is evidence of the maximum erosion that occurs midbay and the strong long-shore drift (Mutch & Liggett 1985). Sandy Pt is an important historic and recreational area between the entrance and the Oreti River mouth.

Conservation Values:

Natural: abcdefgh

Cultural: ade

Historic: abcd

Comment:

The estuary is Southland's most important feeding area for waders and other water birds. Not only have 74 species been recorded from this area, but also the greatest total number of wading birds of any Southland estuary (Cooper pers com). It also has the highest usage by transequitorial waders of all the Southland estuaries including several rare and threatened species. High numbers of Eastern bar-tailed godwits, South Island pied oystercatchers, turnstones and knots use the estuary and NZ and banded dotterel (both threatened) are regular visitors. Exceptionally high numbers of waterfowl occur around the city tip in the north because of enrichment there (SSWI). Little breeding of birds occurs in the estuary. A colony of Caspian terns (threatened) which breed on a shellbank in the vicinity of the tip have been the subject of scientific monitoring for several years. This is the southernmost colony of this species in the world (Cooper pers com). The Sandy Point wetlands, are an important breeding ground for shoveler duck which are quite selective breeders (ICC 1989).

The estuary including Mokomoko Inlet provides extensive rearing and spawning habitat for marine and freshwater fish species (WNIFD). Five species of flatfish with high numbers of juveniles recorded are present as well as eels, brown trout, whitebait and other fish species. Giant kokopu, a rare species, occur in one of the tributaries (FFD). Trout congregate in the Oreti arm before travelling upstream to spawn and whitebait spawn in both the Oreti and Waihopai (SUC 1983). Several small areas retain a natural state and are representative of the district's lowland vegetation. At Bushy Pt a narrow strip has an intact sequence from coastal forest through rush and swamp to the estuary; this area a natural buffer and contains low numbers of South Island fernbirds. These birds have been the focus of a two year scientific study (Barlow 1983). A small area of kahikatea forest remains near Southland Hospital, and at Sandy Pt there is intact Halls totara forest on an old dune area with associated ponds and wetlands. This site is also the type locality for *Gunnera albocarpa*. A botanical list of native species has been compiled for this area by F W Lokan and has been included in the New River Technical Advisory Committee Report on New River Estuary (1976). Sandy and Bushy Pt areas are also both type localities for various species of coastal invertebrates (B Patrick pers. comm).

Several areas are of geological interest. Between the estuary and Oreti Beach, also in the south east of the estuary, occur late Quaternary beach accretion ridges. On the east side of the Mokomoko Inlet is a section of intertidal Permian metasediments containing a diverse assemblage of marine trace fossils, bivalves and a gastropod (Lindquist 1988). Ventifacts are present along the eastern side of Mokomoko Inlet (R Beck pers com).

In the Sandy Point/Daffodil Bay/Oreti River mouth area are several sites of prehistoric and historic maori occupation including middens, and burials; the site of an ancient kaika Oue lies in the back dunes. Also in this area are European occupation and industrial sites - early activities here were shore whaling, farms and sawmilling with the associated wharves used before the bar closed the estuary (Hall-Jones 1976). On Mokomoko Inlet are both Maori and European settlement sites including Stanleytown at the eastern entrance (Williams 1983). Around the present city fringes are maori middens and ovens (Williams 1983), and further early European sites associated with the founding of Invercargill (NZHPT). Many of the inner and south city buildings here are classified by the Historic Places Trust. At least sixteen ships have been wrecked in the estuary or just outside the heads but apart from one in the Omaui sands, no remains are known (Ingram 1984).

The Sandy Pt area is used by schools for educational field trips. Sites with traditional values include Oue which is of spiritual significance to the Maoris and parts of the estuary and Mokomoko both traditionally used as kaimoana sites for pipis and flatfish (Davis pers com). Sandy Pt/Oreti mouth has traditional Maori and European values with which the historic sites are associated; a commemoration plaque has been erected at Sandy Pt. Oreti means the Snare in Maori. This site has moderately high conservation values.

Site Importance: International **National** Regional Local Unknown

Comment:

The New River Estuary has been assigned the status of national importance for both fish and bird species by the WNIFD and SSWI databases. This area is also part of the complex of five southern estuaries important to waterfowl and waders (Cooper pers com). Geologically, Lindquist (1988) has identified the Quaternary beach accretion ridges of potential importance for understanding recent sea level changes. and the Permian metasediments on the eastern side of Mokomoko Inlet as worthy of scientific study. Reserve status has been suggested for this latter area. The Wetlands of National Importance to Fisheries database ranks the area as outstanding.

Existing Threats:

Type and Comment: abcdeijklm

Considerable reclamation has occurred around the Waihopai Arm, Invercargill Airport, the city tip and sewerage works area. The pondage area here once held a large volume of water at high tide (to be discharged again at low tide) and this has been reduced by about one quarter. Flooding of the low lying areas, including the city is a major problem. Considerable siltation of the estuary has also occurred in both the lower Oreti River and the upper Waihopai arm; a build up of mud, silts and organic materials has been occurring for several years. This can be expected to have serious long term effects on the drainage outfalls of the city and on flood flows from the Otepuni and Waihopai streams (New River Technical Advisory Committee Report 1976).

Spartina grass was first introduced to the estuary in 1930 and has subsequently spread to cover major areas of it. It has an adverse effect on the habitat available for wildlife and fisheries; dense *Spartina* is little used by animals (Lee and Partridge 1983). Its ability to increase rates of sedimentation results in a serious reduction of waterways and affects stormwater outfalls. There is also a loss of recreational areas (SUC 1983). Water pollution in the estuary has resulted from several sources - the city rubbish tip, the sewerage works and other industrial pollution. Stormwater and treated effluent from the city is discharged into the area as is Otatara's drainage system (New River Technical Advisory Committee Report 1976).

Competition for nesting space between black-backed gulls and the tern colonies (Caspian and white fronted) is threatening the breeding success of the tern populations (Cooper pers com).

Potentially harmful and corrosive sulphur dioxide is released into the atmosphere by the Awarua phosphate works on the eastern side of the Estuary. However, the effect this has on the plant and animal species in this area is unknown (pers obs).

At Sandy Pt, grazing animals, afforestation, noxious plants especially marram, lupin and gorse, also motorbike use threaten the natural communities remaining (ICC 1989). Indiscriminate use of herbicides in the vicinity of the Waihopai River is also of concern, in the remaining wetland areas. (Articles in the Southland Times 1990).

There is minor rubbish dumping occurring in the Mokomoko estuary and a prospecting licence over some of this area exists but no work has been done to date (B Rance pers com).

Human Modification and Human Use: abehij

Popular recreational activities are whitebaiting and trout fishing especially in the Oreti Arm, also flounder netting and spearing, eel and mullet fishing. The rifle range and airport exist on reclaimed land along the northern edge in the estuary. Stead Street jetty is a base for Sea Scouts. Duck shooting also occurs.

The Daffodil Bay/Sandy Point/Oreti mouth area is extensively used for a range of shore and water based recreation including rowing and power boating (ICC 1989) and has picnic areas, tracks and a small holiday settlement. Bushy Pt is popular with ornithologists (Cooper pers com). It is no longer safe to eat shellfish gathered from the estuary (SUC 1989) and few trout remain in the Waihopai River because of the pollution (SUC 1983). However the estuary was a traditional kaimoana area once (Davis pers com).

Existing Protection:

Type and Comment: afdi

1. The Invercargill District Council has a grant of control over the estuary.
2. Otatara South Scenic Reserve - 18ha; only example of Southland sand dune forest on Crown land.
3. Southland Hospital Board Conservation Covenant.
4. The New River estuary is zoned as estuarine in the District Scheme.
5. Legal unformed road runs along much of the southern estuary edge.

Availability of Information:

Natural	1	②	3	
Cultural	1	②	3	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with knowledge of this area are Brian Rance, Wynston Cooper and Pete McLelland.
 Traditional Maori fishing areas - K Davis, MAF, Dunedin
 Archaeological Values - Russell Beck, Southland Museum

Recorded on Existing Databases: Comment:

1	WERI	- New River estuary and Mokomoko Inlet
2	SSWI 1980	- Daffidol Bay bush, New River Estuary, Bushy Pt, Otatarā Bush
3	PNA	
4	Geopreservation	
5	HPT County Inventories	
6	Other	- Freshwater Fish Database, Wetlands of National Importance to Fisheries
7	None	1986

Other Considerations:
References

Accompanying Maps and Photographs:

Site Names: Oreti Beach embayment

Site No: 140013

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E46 21400 54140

Date: 11 March 1990

Brief Description of Site:

Oreti Beach extends from the mouth of the Aparima Estuary at Riverton in the north, to the New River Estuary. 32km long, it is a wide, flat fine-grained sandy beach. Near Riverton the foredunes are only 1m high, rising to 8m in the south, densely covered with marram grass. The NW portion is backed by low dunes and farmed plains; to the south by lupin and gorse and pine afforestation with some totara forest (site 12). The dunes are almost devoid of native plants; less modified native communities survive in damp sand near stream hollows at Otaitai Bush Road. At Waimatuku and Ferry Road the hollows are covered with club rush and many saltmarsh turf herbs. The Waimatuku River which enters mid-beach has a catchment of 161km². The Outlet is vulnerable to blockage by wind and tide. There is evidence of maximum erosion mid-bay and strong longshore drift to the east.

Conservation Values:

Natural: bcdegi

Cultural: ace

Historic: bcd

Comment:

On the beach (and inshore area) populations of toheroa, an uncommon shellfish, (*Amphidesma*) occur south of the main entrance to the beach, also near Waimatuku River mouth. The dunes themselves are highly modified by marram (Johnson 1983) but several areas of back dune have high wildlife values. These are Otaitai ponds, 4ha of freshwater ponds, willow and flax wetlands used by high numbers of common waterfowl (SSW1); and at the Waimatuku River mouth an estuarine area with associated lagoon and saltmarsh areas which are a key Southland site for coastal invertebrates, B Patrick (pers. comm.). This covers 15ha, and is a feeding and loafing area used by gulls and terns, also banded dotterels, a threatened species (WERI). These lagoons are a nursery area for flatfish and contain whitebait and trout. Nearby Big Lagoon, 35ha of ponds, manuka and rush swamp contains unspecified threatened species (WERI) and is an important paradise duck moulting site. Also nearby is Long White Lagoon a 15ha wildlife refuge, a high value feeding, breeding and moulting area. Marsh crakes are present here (SSWI). Oreti is a type locality of one of the world's rarest plants in the wild *Gunnera hamiltonii* (B Rance, pers comm.). The original population no longer survives but it has been replanted from the original Oreti stock which has been cultivated (Rance pers com). A few NZ dotterel, (a threatened species), are reported to over winter on Oreti Beach (DOC 1987).

Of geological interest are the old storm-beach gravel ridges between the Sandy Pt area and the beach, which are of Late Quaternary origin; shell beds in the Otakau Creek area molluscs shells of Pleistocene origin (Linguist 1988).

Hectors dolphin strandings are relatively common near the southern end. Paddle crabs and flounders are present in the bay.

Little is recorded of the historic or traditional values of this area. At Waimatuku Captain Howell's house is classified by NZHPT. The river mouth was the site of the wreck of the Barrow in 1863 (Ingram 1984). Otaitai Bush was an early flaxmilling site and buildings here are also classified. No Maori sites are known other than those included in site 12. (The town of Riverton is part of site 14). The Barrow a schooner was wrecked on Waimatuku Beach (Ingram 1984) in 1863. The toheroa and pipis of the area were probably a traditional food source for the Maoris (Davis pers. comm.).

Schools use Oreti Beach for field trips to study sandy shores. The area has value as a land - seascape and WERI identifies the landscape values of the Otaitai Bush area. This site has moderate conservation values.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

As a habitat for toheroa the area is probably of national significance, the larger area is probably of regional importance for cultural reasons. This is also the type locality of *Gunnera hamiltoni* (Wilson and Given 1989).

Existing Threats:

Type and Comment: cdf

The principal threat to the dunes is the presence of marram which has destroyed much of their botanical (and probably entomological values (Rance pers. comm.). Little diversity or native species remain. In places lupins, broom and gorse are problematic as at the Waimatuku - Big Lagoon area. Introduced grasses and herbs are a threat to the native turf communities. In gravel pits behind the beach sand and gravel is being extracted, which may destroy the gravel ridges of the Quaternary Origin if extended. There is insufficient control over the use of land adjoining the wildlife reserves.

Human Modification and Human Use: ahik

Oreti Beach is extensively used for recreation - both shore-based (picknicking, walking, horse riding) also swimming and surfing. A small settlement exists at Curran town in the back dunes: The harvesting of toheroa is restricted by MAFFish, based on a sustainable harvest. For the past two years there has not been any take allowed. Dragnetting for flatfish occurs along the beach. Duckshooting, whitebaiting and trout fishing occurs at Waimatuku River Mouth and lagoons (SSWI). Ornithology is also pursued at the lagoon areas (Cooper pers. comm.).

Existing Protection:

Type and Comment: adi

1. This area is closed to the commercial take of shellfish and kina under Fisheries regulations.
 2. Waimatuku River Mouth Wildlife Refuge - 100 ha including 2 large lagoons and a swamp.
 3. McDonald JF and CJ Open Space Covenant - 20ha including a small lake.
 4. Otaitai ponds - private wildlife refuge.
 5. Legal road runs along the south and north area of the beach, and the central area is Stewardship land.
 6. Fisheries regulations control the take of toheroa by limits and closed seasons.
-

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Of the local DOC staff, Brian Rance is familiar with the *Gunnera hamiltonii* area and Wynston Cooper with the lagoons.

Recorded on Existing Databases: Comment:

- 1 WERI 1980 Waimatuku River Mouth, Big Lagoon, Long White Lagoon, Otaitai Ponds.
- 2 SSWI 1980 Other inland sites are SSWI eg gravel pits (1980).
- 3 PNA
- 4 Geopreservation.
- 5 HPT County Inventories
- 6 Other
- 7 None

Accompanying Maps and Photographs:

Site Names: Jacobs River estuary/Riverton

Site No: 140014

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: D46 21250 54175

Date: 11 March 1990

Brief Description of Site:

Jacobs River estuary a moderately large shallow water estuary formed by the confluence of the Pourakino and Aparima Rivers, covers about 165ha of which 60% is mudflat at low tide. The seral fringe is jointed wire rush, also flax swamp. The larger river, the Aparima has a catchment of 1375km²; and the estuary has around 18km of tidal waters. The principal use of surrounding land is pastoral. An important local commercial fishing fleet is based at the estuary entrance, where the town of Riverton is also located. At the estuary's entrance is a shallow bar with strong tidal flows. The river mouth is tucked in closely to the margin of the Riverton Rocks coastal promontory (Mutch & Ligget 1984).

The estuary is still largely unmodified despite the adjacent farmland and the presence of Riverton. A railway causeway and road bridge cross it near the mouth; these have significantly modified the hydrology of the estuary (SUC 1989).

Conservation Values:

Natural: cdh

Cultural: ac

Historic: abc

Comment:

The estuary's principal value is as a nursery area especially for flatfish. It is also a rearing area for brown trout and sea dwelling trout pass through the estuary during summer and autumn enroute to their spawning grounds (SUC 1983). Yellow-eyed mullet, black flounder, kahawai and whitebait are also present (WNIFD). There is a large and varied waterfowl population and as a habitat the estuary has moderate significance (WERI). The main value of the estuary is its extensive mudflats and the seral fringe (Department of Lands & Survey Coastal Reserves Inventory, Wallace County). It is an important component of the complex of five Southland estuaries used by migrant waders including transequitorial species (Cooper pers com). Thirty eight bird species are dependent on the waters, mudflats and marginal vegetation (and further species on the adjacent native bush) (SSWI). These include Australasian bittern (threatened), variable oyster catcher, least golden plover (rare), banded dotterel (threatened), far-eastern curlew (rare), Caspian tern (threatened). The marginal fringe of the wetland spit is probably the best pukeko habitat in Southland.

An elevated sand bank south of the railway is used as a neap tide roost; shag roost also exists. Red billed gulls breed on a rock and on maimai structures (SUC 1983). The inanga fishery is dependent on the remaining rush vegetation (WNIFD).

A small area of bush adjacent to the eastern estuary edge, with a large percentage of manuka and totara, protects the foreshore.

Maori archaeological sites occur around much of the estuary's edge (NZHPT). Eeling and flatfish fishing were traditional activities in the estuary, and the sites are presumed to be associated with occupation (Davis pers comm).

European historic use relates to a settlement established by Captain Howell in 1834, a shore whaling station in 1837 and subsequent expansion of the settlement as a farming and fishing base (Hall-Jones 1976). Several wrecks have occurred on the bar and in the harbour including the Pearl on Taylors Pt and the Fly (1863) and Agnes Rose (1882) on the bar (Ingram 1984). The area has landscape values as well (SUC 1989).

Site Importance: International **National** Regional Local Unknown

Comment:

The estuary is part of the complex of 5 southern estuaries used by wading birds and waterfowl including migratory species many of which are rare or threatened and as such if of national importance.

The estuary is ranked by the Wetlands of National Importance to Fisheries as outstanding.

Existing Threats:

Type and Comment: bcdm

Some siltation has occurred in the estuary. The water is still relatively clean however.

Spartina grass is present, which threatens both the sedimentation pattern and biological values of the area. Further clearance of land for agriculture or drainage of the seral fringe would also threaten the estuary's value. There is a public rubbish tip at Riverton, and further infilling is a threat. Only in two areas is a buffer between pasture and sea provided by an intact vegetation sequence - Crown land at the mouth of the estuary (threatened by grazing) and a bush remnant at "the Narrows".

Human Modification and Human Use: abdhij

Whitebaiting is the dominant recreational activity in the estuary; duck shooting, trout fishing are other recreational fisheries. Cockles are harvested from shellfish beds in the main estuary (SUC 1989). Boating, water skiing and ornithology are also pursued. Land development around the estuary includes both agricultural land and development associated with the town of Riverton and the fishing port in the outer harbour (SUC 1989). Both the road bridge and the railway across the estuary have associated causeways/reclamations.

Existing Protection:

Type and Comment: adi

1. A small area of stewardship land is sited in N-E corner of the estuary.
 2. The outer coast is closed to the commercial take of shellfish and kina under Fisheries Regulations; also from the North Harbour lead light to Howells Pt is closed to all shellfish take for one year.
 3. The estuary is zoned under the District Scheme as estuarine.
 4. Legal unformed road runs around part of the estuary shoreline.
 5. Along Taramea Bay to Howells Pt is under local body control.
-

Availability of Information:

Natural	①	2	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	⑦	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with knowledge of this area is Wynston Cooper.

Recorded on Existing Databases: Comment:

①	WERI 1979	Patches of forest around the estuary are included as SSWI (1980).
②	SSWI 1980	
3	PNA	
4	Geopreservation	
⑤	HPT County Inventories 1986	
⑥	Other	
7	None	Wetlands of National Importance to Fisheries Database 1987

Accompanying Maps and Photographs

Site Names: Foveaux Strait

Site No: 140015

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: 46 deg. 33'S 168 deg. 00'E

Date: 16 March 1990

Brief Description of Site:

This complex area lies in the narrows of Foveaux Strait between Sandhill Pt - Rugged Islands in the west and Slope Pt - East Cape in the east. The floor of the strait slopes imperceptibly downwards towards the east. At the eastern entrance it falls steeply to the Eastern Foveaux shelf. Bands of cobbles and pebbles cross the strait at the Ruapuke Ridge and also between Black Rock and Wakaputa Points. Between these bands occur fine patches of biogenic sediment. A ridge of aerial stacks and islands including the Ruapuke Group, the northern Titi Islands and Bench Island crosses the eastern edge; these are remnants of a drowned landscape (Cullen 1967). Strong tidal flows up to 3 knots occur through the Strait - the rising tide eastward, the falling in the reversed direction. The Southland Current is split at the western entrance, part flowing eastward through the strait and part south around Stewart Island.

Westerlies are the predominant wind. The strait is known as one of the roughest stretches of water in the world, in adverse weather conditions.

Conservation Values:

Natural: bcei

Cultural: a

Historic: bcd

Comment:

Two interesting features of submarine morphology in Foveaux Strait are the Rakiura Gap and the Ruapuke Basin (after Cullen). The Basin is a depression, roughly 16km long and 5km wide at 37 fathoms depth south of Ruapuke. A long narrow shelf around it, delineates it from the open shelf. Cullen interprets it as the remnant of an ancient, submerged coastal lagoon comparable to those that occur along the present day coastline to the north. The Rakiura Gap a submarine valley is described in site record 14040.

Much of eastern Foveaux Strait is covered by beds of Bluff oysters (*Ostrea lutaria*) principally on medium to fine sandy pebble gravels (Cullen 1962). (These beds are the basis of the Bluff oyster fishery). These oysters are also known in Wellington Harbour. The floor of Foveaux Strait is a mosaic of mollusc species, each with very local dominance. Two important bivalves here, which are not found in northern waters, *Ponopae smithae* and *Longimactra elongata*. The brachiopods *Terebratella inconspicua* and *T. Sanguinea* also occur, and occasionally *Neothyris lenticularis*. The oyster beds are also known for their chitons, including species not found elsewhere. This fishery has a historical component, dating back to the nineteenth century; as such it is a traditional use of the strait. The beds originally exploited were in Port Adventure and round Stewart Island, to the east of Halfmoon Bay and The Neck. Yearly monitoring is conducted by the oyster industry on the abundance and health of the industry. There is a closed research area near Ruapuke. Seabirds, in particular sooty shearwaters feed in the strait in large numbers, seasonally. Sperm whales, Hector's dolphins and southern right whales are occasional users of the area.

Ventifacts are occasionally dredged up (Russel Beck Pers. Comm); these are probably an extension of the ventifact fields around Bluff/Greenhills/Toetoes. At least 28 shipwrecks have occurred in Foveaux Strait.

The Maori name for Foveaux Strait is Te Ara-a-kiwa, the path of Kiwa who was a great god of the sea who thought the strait was too narrow and sent a large whale to widen it; the whale ate the land edges; the fragments which fell or were spat out became the islands in the strait.

Site Importance: International **National** Regional Local Unknown

Comment:

The extensive Bluff oyster beds, the brachiopods (mentioned in the ICUN red data book) and ventifacts in the Strait make this site of national importance.

Existing Threats:

Type and Comment: i,k

A threat to the oyster beds is the occurrence of parasite bonamia which devastated a large proportion of the beds, a few years ago (Street and Hallorane 1985). High heavy metal levels, particularly cadmium, seem to be a natural feature of species in the area (Street and Hallorane 1985). The disposal of rubbish at sea is a threat to marine mammals and seabirds in the vicinity. The effect of bottom trawling on the oyster beds has been studied but this concentrated only on damage to the oysters; other effects are uncertain (Street and Hallorane 1985).

Human Modification and Human Use: k

The principles uses of this area are fishing. Extensive oyster beds in the eastern strait are subject to a regulated dredge fishery by a Bluff fleet.

Commercial trawling occurs in several areas, particularly the mouths of Te Wae Wae, the Oreti Beach embayment, and Toetoes Bay. The main species caught are flatfish, elephant fish, rig, monkfish and red cod, also in the east gurnard and spiny dogfish (SUC 1983). Codding occurs by recreational boaties around Halfway Rocks (Oreti) and Mid-bay reef in Te Wae Wae.

Existing Protection:

Type and Comment: d

The oyster fishery is regulated as to season length, shellfish size and total tonnage which can be caught, also the number of boats in the fishery (Fisheries Regulations). An area close to Ruapuke to closed to the commercial fishery and is used for research by MAFfish - see site 14021 for details.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

There are a suite on papers on the oyster fishery, which are included in the bibliography of Stewart Island references related to potential marine protected areas.

Sources of Information:

Natural	①	2	3	4	5	6	7
Cultural	①	2	3	4	5	6	7
Historic	①	2	3	4	5	6	7
Threats	①	2	3	4	5	6	7
Human Mod. & Use	①	2	3	4	5	⑥	7

- 1 Derived information from existing literature and databases.
- 2 Derived information as above and field check.
- 3 Derived from existing maps and aerial photographs.
- 4 Recent DOC survey including sampling and analysis.
- 5 Recent DOC survey excluding sampling and analysis.
- 6 Experience.
- 7 Expert Opinion.

Comment:

John Cranfield, MAF, Greta Point holds most of the data relevant to the oyster beds and fishery.

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - 3 PNA
 - 4 Geopreservation
 - 5 HPT County Inventories
 - 6 Other
 - ⑦ None
-

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Riverton/Colac Bay

Site No: 140016

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: D46 21200 54157

Date: 14 March 1990

Brief Description of Site:

This site extends from Taramea Bay at Riverton westward to include Colac Bay and Oraka Pt. A small settlement is located at the western end of Colac Bay sheltered from the prevailing wind. A road runs alongside parts of the sandy/gravel beach here.

The level crest and level of the beach hold a rich flora of mat plants such as shore bindweed, *Gentian saxosa* and *Selliera*. In the centre of the bay is a tall dune, 8m high, overrun with weed species. Between Colac Bay and Howells Pt is about 8km of rocky coast backed by grassy slopes and above that kamahi/rata forest, previously logged. A small beach at Howells Pt is of gritty sand and pebbles with windblown sand behind. Taramea Bay is a sheltered sandy beach backed by a road and residential area, part of Riverton. Pig Island offshore is low, only 600m long with shores of gravel and rock platforms. The vegetation has been modified by burning and weed species (DOC 1989).

Conservation Values:

Natural: ceg

Cultural: ae

Historic: b

Comment:

At Howells Pt, basaltic volcanic rocks from the Permian age are exposed; these include pillow lavas, cross-cutting dykes and metasediments, which are of scientific interest (Linguist 1988).

Bull-kelp is present and there are rich communities in the rock pools formed in the rounded forms of the rocks, but little reported of the marine life of this area. Fur seals haul out around the point occasionally. Pig Island offshore live a population of wekas, transferred here by Maoris or sealers (DOC 1989).

This area of coastline contains many maori archaeological sites including a burial ground which is sited near Colac Bay and on Oraka Pt is the grave of Rawiri Te Awha a Maori guide in the 1850s (Hall-Jones 1979). There is a record of the occurrence of the rare giant kokopu in a stream at the western end of Colac Bay (FFD).

The rocky coast area is a traditional Kaimoana area for Maoris, for food such as shellfish and paua. Taramea Bay/Howells Pt area is a proposed taiapure area (Kelly Davis pers com), Oraka kaika, a Maori village used to be located in the western bend of Colac Bay (Hall-Jones 1979). Both Oraka Point and Howells Pt are used by schools on field trips.

Site Importance:

International

National

Regional

Local Unknown

Comment:

The geological features are of regional importance, as would be its archaeological values.

Existing Threats:

Type and Comment: cdfij

Moors Scenic Reserve and the adjacent bush has been modified by logging, by browsing stock and pigs. The bush edge is also suffering from wind damage (DOC 1989). On the Colac Bay dunes marram is common on the front dune and some gorse and lupin on the back dune. Dense marram also occurs at Howells Pt. Sand extraction is occurring at Colac Bay (Tihaka Beach). A minor public rubbish tip is also located at Colac Bay. At Howells Pt and Oraka Pt, stock (sheep) graze right down to the coast which includes sensitive coastal turf communities (Rance pers com). There is a local quarry at the road end behind Howells Pt.

The prime threat to this coast is the depletion of shellfish stocks particularly mussels and paua. There is a temporary closure of 1 year on all take but this may need extending.

Human Modification and Human Use: ahij

Much of the land backing the shore has been developed for farming, around the forest patches (which have been logged). Howells Pt is a popular picnic and camping ground, part of the Howells Pt domain. Taramea Bay also has recreational facilities and an annual carnival is held here.

Walking, picnicking, bird watching are other popular activities in the Riverton - Colac Bay area. (Wallace County Coastal Reserves Inventory).

Around Howells Pt, paua, mussels and kina are gathered; this also occurs as a traditional Maori activity. The Colac Bay inshore area is used for both surfing and windsurfing.

Existing Protection:

Type and Comment: aci

1. Paper roads exist along much of this coastline eg Oraka Pt.
 2. Moors Scenic Reserve is under local authority control.
 3. Under Fisheries regulations, all shellfish take is prohibited from Howells Pt right to the Harbour entrance - the North Harbour light for one year.
 4. West of Howells Pt, a small area is under local body control.
 5. Pig Island - scenic reserve.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	②	3	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural ① 2 3 4 5 6 7
 Cultural ① 2 3 4 5 6 7
 Historic ① 2 3 4 5 6 7
 Threats 1 2 3 4 5 ⑥ 7
 Human Mod. & Use ① 2 3 4 5 ⑥ 7

- 1 Derived information from existing literature and databases.
 2 Derived information as above and field check.
 3 Derived from existing maps and aerial photographs.
 4 Recent DOC survey including sampling and analysis.
 5 Recent DOC survey excluding sampling and analysis.
 6 Experience.
 7 Expert Opinion.

Comment:

B Rance, DOC has knowledge of this area. Attendance at a meeting of recreational fishermen in Southland; concern about the paua fishery was expressed at this meeting.

Recorded on Existing Databases: Comment:

- Riverton Forest and Bungalow Hill Bush are on SSWI also.
 Longwood Bush remnants.
- 1 WERI
 ② SSWI (1980)
 ③ PNA (1984)
 4 Geopreservation
 ⑤ HPT County Inventories 1986
 ⑥ Other - Freshwater Fish Database 1986
 7 None

Accompanying Maps and Photographs:

Site Names: Centre Island/Escape Reefs

Site No: 140017

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: D47 21140 54045

Date: 16 March 1990

Brief Description of Site:

This site includes Centre Island, which lies approximately 7km off Oraka Pt, in Foveaux Strait; also the adjacent off-shore reefs and islets within a radius of 8km, including Raratoka Island, Escape Reefs and Hapuka Rock. This is in the north-western part of Foveaux Strait. Most of Centre Island is rough pastureland of introduced grasses.

On steeper slopes to the west and south is a saltmarsh turf community. Dunes backing sandy beaches on the north and eastern shore are dominated by introduced marram grass. On Centre Island is a historic lighthouse and keepers, houses and sheds (Cooper 1989). The seafloor around the reefs is a 10-20m deep platform of coarse pebble gravels; to the south it slopes steeply down to the Foveaux Strait Shelf which here is 40-60m in depth. Prevailing weather conditions in the area are generally rough. The Southland Current flows eastward through Foveaux Strait.

Conservation Values:

Natural: c

Cultural: a

Historic: bc

Comment:

A small area of pingao (rare) persists along the eastern shore of Centre Island. Several sea bird species use the island including sooty shearwater which breed in low numbers, Stewart Island shags (rare, Bell 1986), variable oyster catchers, banded dotterel (threatened), yellow hammers and various other gull, shag and tern species. Yellow-eyed penguins are known to use the island, but their breeding status is unknown. Little blue penguins breed here in significant numbers. Rats probably *Rattus rattus* are present. A few seals are known to haul out in the area (regionally threatened) (Cooper 1989).

Centre Island was purchased from its Maori owners in 1853 and a lighthouse constructed in 1878 to mark the adjacent reefs. John Boulton (Starke 1986) records the presence of a kaika on Centre Island; (the island was owned by two sons of the chief Te Wae Wae Te Au and Poko - Mantell, Beattie reported in Starke p74). Maori archaeological sites are recorded for Centre Island (HPT 1986).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The presence of pingao, a rare plant (Wilson & Given 1989) and rare and threatened bird species (Bell 1986), makes this area of national significance.

Existing Threats:

Type and Comment: di

The unrestricted grazing of stock (sheep and cattle) on Centre Island is a threat to the coastal turf communities (Rance pers com). Marram threatens the remaining pingao (Cooper pers com). Commercial diving for paua threatens stocks of this species as around much of the Southland and Stewart Island rocky shoreline (subject of discussion, recreational fishermen's meeting, Invercargill March 1990).

Human Modification and Human Use: aik

Fishing is the principal activity around these reefs - lining for blue cod and groper, cod potting, crayfish potting and diving for paua kina and finfish are all carried out in the vicinity. Both commercial and recreational take occurs.

The lighthouse is automatic, one of many being demanned. Access to the island is generally by small plane as there is a strip on the island.

Existing Protection:**Type and Comment: i**

1. Centre Island does not appear to have been vested in either in Minister or Ministry of Transport who the legal controlling authority is, is unclear.
2. The reefs and rocks are presumed to be either not above MHW or unallocated Crown land.

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

A further search for information on the marine values of this area is warranted, including local knowledge.

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Wynston Cooper's report = field check; this deals principally with the bird life; a further field check is recommended.

Recorded on Existing Databases:

Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- ⑤ HPT County Inventories 1986
- 6 Other
- 7 None

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Lake George/Kawakaputa

Site No: 140018

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: D46 21120 54140

Date: 14 March 1990

Brief Description of Site:

Lake George is a large shallow lagoon and an adjacent remnant of what was once an extensive peat swamp, plus a small area of swamp forest. The area is lowlying, about 1km from the coast, and drains into the sea via the Ourawera Stream. This complex covers about 510ha of which about 100ha is a vast flax swamp and 100ha regenerating forest.

The nearby Kawakaputa Beach is a gentle sandy beach, 5km long, with cobbles at the western end. Fore dunes, 8m high, extend for several hundred metres towards the eastern end. Between the beach and the Lake George area, podocarp forest occurs in old dune hollows, extending back over an old railway line to the rushland and scrub around the lake (Johnson 1983). There are many artificial tarns and canals in the area, the result of previous mining (WERI).

Conservation Values:

Natural: bcdfh

Cultural: ace

Historic: bc

Comment:

Whilst most of the Kawakaputa dunes are densely covered with marram, lupin, and broom, a small area of pingao (rare) still persists.

At the western end on a small rocky island, a large colony of red-billed gulls and also white-fronted terns breed (W Cooper pers com).

The Lake George lagoon and wetland area supports a full range of NZ wetland birds, waterfowl and wading species including breeding (WERI). The wetland supports moderate numbers of fernbirds and marsh crakes (WERI). The lake and tributaries also contains a substantial population of giant kokopu, a rare galaxiad, as well as commoner galaxiad species (WNIFD). Migrant waders also use the Lake George area; including Japanese snipe (Miskelly and Cooper 1985) and ruff (Miskelly et al 1985) on occasional visits.

Post glacial marine deposits on coastal beaches (at the 10-20 metre level) at the 10-20 metre level are present in this area. An intact vegetation sequence extends from the dunes through coastal forest to the wetlands.

John Boulton (Starke 1986) reported the existence of a Maori kaika at Kawakaputa, as well as Pahia, during his travels in 1826. Maori occupation indicating Archaeological sites are present in the coastal area including a burial which is probably unrecorded. The goldmining workings are also of historical interest (NZHPT).

WERI ranks Lake George (Tidey pers com) as having both educational and landscape values. It is the only coastal wetland remaining in a natural condition in Western Southland.

Site Importance: International National Local Unknown

Comment:

This area, especially Lake George is of at least regional importance and possibly more because the Lake George and the Henderson Extension are ranked as outstanding in the Wetlands of National Importance to Fisheries Database. The occurrence of the rare giant kokupu makes this area of national significance.

Existing Threats:

Type and Comment: cfi

Some gorse is present in the Lake George area, in the shrub-swamp vegetation.

Concern has been expressed (Recreational Fishermen's Meeting, March 1990, Invercargill) that fishing pressure is depleting the paua resource.

Marram lupin and broom are threatening the remaining biological values of the Kawakaputa dune. Sand extraction is also occurring from here. Mining is occurring on old workings in one corner of the wetland area (Rance pers com).

Some problems exist with adjacent land use and drainage of the surrounding area (field centre staff pers comm).

Human Modification and Human Use: dnij

Some whitebaiting takes place at the mouth of the Ourawera Stream. Other popular pursuits in the Lake George area are ornithology and duck shooting.

The rocky coast area is used for fishing, diving and shellfish gathering both recreationally as a traditional Maori use of the area.

The Acclimitisation Society have a water right to control the lake's water level.

Existing Protection:

Type and Comment: ai

The swamp land is Crown land and the lake and Henderson extension is a Wildlife Management Reserve under the control of the Southland Acclimitisation Society (379ha). A legal unformed road runs along parts of the coast line.

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC staff with experience of this area are Trevor Tidey, Barry Bennett and Wynston Cooper.

Recorded on Existing Databases: Comment:

- 1 WERI (1979)
 - 2 SSWI (1980)
 - 3 PNA
 - 4 Geopreservation
 - 5 HPT County Inventories 1986
 - 6 Other
 - 7 None - Freshwater Fish Database, 1986. Wetlands of National Impt to Fisheries 1987.
-

Other Considerations:**Accompanying Maps and Photographs:**

Site Names: North-east Stewart Island

Site No: 140019

Recorders Name: Jane Hare/S King

Conservancy: Southland

Map/Grid Ref: D48 E48 21270 53710

Date: 10 March 1990

Brief Description of Site:

This site extends for approximately 65 km along the coast from near Cave Point in the north to Ackers Point at the entrance to Halfmoon Bay. In general it is an alternating series of hard shores and sandy beaches. From Saddle Pt south to Christmas Village is a length of rounded boulder shore. Small dunes systems are present at Murray Beach, Bungaree and Maori Beach (pers. obs.). In the south enclosed bays occur at Port William and at Horseshoe and Halfmoon Bays; around the latter two which the only settled area of Stewart Island is sited. The coastline is influenced by strong tidal currents, the Southland Current flowing eastward and southward along the coast, and by the prevailing south westerlies. (King et al, 1985). From Saddle Pt south the shore is relatively sheltered. There are small estuaries at Murray River, Maori Beach and Mill Creek.

Human impact is generally limited to the tramping track which mostly follows the shoreline, also commercial fishing inshore and the settlements mentioned above.

Smokey Beach is site 140019-A.

Conservation Values:

Natural: abcg

Cultural: abc

Historic: abcd

Comment:

This coast retains a high degree of naturalness, with some modification around the settled areas and adjacent small areas of farmland. The rare (Bell, 1986) yellow-eyed penguins have been recorded ashore at a number of sites including Long Harry, Smoky Beach, Yankee River, Christmas Village, Rollers Beach, Murray Beach, Big Bungaree, Sawyers Beach and Maori Beach (pers obs). A small area of punui (*Stilbocarpa hyalii*) may still be present near Long Harry (R Tindal pers comm); this is a rare plant (Wilson and Given, 1989).

Although all the dunes are small, pingao which is rare (Ibid) is present at Murray Beach. (Wilson's dune inventory). Variable oystercatchers (which are rare (Bell, 1986) are known to breed on some of these beaches including at Maori River and Mill Creek where there is a small estuary (Wilson, 1981). (Here is the best example of *Plagianthus divaricatus* salt shrubland on Stewart Island (Wilson, H Wilson, H D 1981).

Fur seals haulout out occasionally at Cave Point, Lucky Point, Saddle Point and the Bishop and Clerk Islands (Wilson, G J 1981).

Monitoring of crayfish perulus in Halfmoon Bay by MAFFish has shown a good relationship between the abundance of these and later catches of crayfish around Stewart Island as the perulus reaches legal size. This has important implications for setting quotas (J Booth, MAF, pers comm).

Many of the bays have known sites of Maori occupation - Yankee River, Christmas Village, Murray Beach, Bungaree, Port William, Little River and Lee Bay, (HPT County Inventory) probably indicating a highly mobile population moving from bay to bay. European activity was also widespread. A sealers settlement existed at Christmas Village. Later sawmills were established at Murray River and Maori Beach, the latter lasting until the 1930s depression (Howard, 1974). Relics remain in each area (personal observations). Mining occurred around the Port William-Bungaree area. At Port William, a settlement was laid out and imigrants brought from the Shetlands but this was short-lived. Much of the later settlement occurred around Halfmoon and Horseshoe Bays - which were used not only as sawmilling

sites, but as a fishing base including the original Foveaux Strait oyster fishery which was based off Port William at the turn of the century (Howard, 1974). Several historic houses still remain including a stone cottage at Harolds Bay and a nearby boarding house (personal observations).

Shipwrecks are known to have occurred at Port William, Little River and Halfmoon Bay, although no remains are recorded (Ingram, 1984).

Much of this land - sea/scape is dominated by Mt Anglem. The area around the settlements is known for its aesthetic value - sheltered shady beaches with houses nestled in the bush - and it is well-visited unlike most of Stewart Island (personal observations; NZ Forest Service et al 1978).

Site Importance: International **National** Regional Local Unknown

Comment:

Ackers Cottage is of national significance (Russell Beck pers. comm.). The entire coastline also merits this status, because of its lack of modification, the aesthetic appeal of the coast, its intrinsic values as part of the large Stewart Island ecosystem, both land and sea (H D Wilson 1987; NZ Forest Service et al 1978; QEII Trust 1979; Grange and McKnight, 1987) also because of the yellow-eyed penguins.

Existing Threats:

Type and Comment: acdefij (Plan Map 18.2).

Around the Bob's Pt area, cleared farmland, erosion is a problem (pers. obs.). _ Along much of the coast, wild animals - deer, possums - have destroyed much of the forest structure. Coastal forest dieback occurs in the northern area (Williamson, 1976). Marram, and other weed species have invaded all the dune systems and beaches. Gorse is also present at Lee Bay, Port William and near Lucky Beach. Wild cats are a threat to birdlife. Sand extraction which occurs at Lee Bay, Horseshoe, Butterfields and Halfmoon Bay is a threat because all the dunes here have been flattened and replaced by road systems (except at Lee Bay). Large scale commercial paua extraction has occurred and this could have dramatic effect on rocky subtidal communities. (The above points are personal observations).

At Braggs Bay the council rubbish tip has destroyed the aesthetic appeal of a lovely beach and is polluting a nearby creek (pers. obs.). Spoil is also dumped along the Horseshoe Bay Beach backshore alongside the road (pers. obs).

Water pollution is also a problem around the inshore Halfmoon Bay area, primarily because of sewerage polluting the drains which have outfalls across the beach (L McKenzie 1983 and pers comm; L Crossan, pers comm).

Comment:

John Booth, MAF, Research Scientist, Greta Point

Russell Beck, Director, Southland Museum

Lyndsay McKenzie, Resource Manager, Southland Regional Council

Lyndsay Crossan, Engineer, Southland District Council

Recorded on Existing Databases: Comment:

- ① WERI - Maori Beach estuary 1980, Mill Creek Estuary 1983
- 2 SSWI
- ③ PNA - Records of reserve status
- 4 Geopreservation - Stewart Island (1986)
- ⑤ HPT County Inventories - Various archaeological site records of different dates
- ⑥ Other Hugh Wilson's dune inventory, unpublished DOC records
- 7 None

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: Smoky Beach

Site No: 140019A

Recorders Name: S King / J Hare

Conservancy: Southland

Map/Grid Ref: D48 20155 53773

Date: 10 March 1990

Brief Description of Site:

Smoky Beach, 3km in length, is the only dune system on the northern coast of Stewart Island. The dunes extend from low foredunes adjacent to Smoky River which is tucked into the coastal promontary at the western end. They widen to steep, high dunes extending 400m inland at the eastern end; here the sand is actively moving into the adjacent coastal podocarp forest. The sandy beach exhibits a series of cusps, and has a sparse pebble cover. Landing is difficult, only possible near the creek mouth. The direction of long- shore drift appears to be to the east. This tallies with the eastward direction of the Southland current through the Strait. A long windswept gut, open to the north west is present in the eastern end of the dunes. The central portion contains a large dune slack with rush vegetation.

This description is based on personal observations.

Conservation Values:

Natural: abcd

Cultural: abc

Historic: bc

Comment:

The dunes have a high degree of naturalness, little modified by human impact they are an area sensitive to environmental disruptions. The dune system has considerable aesthetic value, with its dramatic wind-swept faces and slopes of bare highly mobile dune faces. The dunes have a high percentage of natural cover, including abundant pingao (pers obs) which is rare (Wilson and Given 1989). Yellow-eyed penguins which are rare, (Bell 1986) have been recorded from both the east and west ends of the beach (pers obs) and banded dotterell have been recorded feeding on the beach (Wilson's dune inventory). The beach is a feeding area for waders at low tide (pers obs).

The area is probably a site of Maori occupation and the site of early European settlement, probably sealers. Historically, some prospecting for gold was also carried out here (HPT County Inventory, Howard 1974).

This site has moderately high conservation value (pers obs).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

As part of Stewart Island a natural ecosystem with high intrinsic values (NZFS 1978, Wilson, 1987, QEII and Trust) and because of the presence of yellow-eyed penguins, this site is of national importance.

Existing Threats:**Type and Comment:** cd

Much of the forest understory has been destroyed by deer and possums and the forest structure weakened. Marram is spreading along the foredunes from the west. A large old-man gorse bush exists adjacent to the river and has been cut back in the past. The marram in particular threatens the biological values of the dune; (all pers obs).

Human Modification and Human Use: h

The beach is part of the northern tramping circuit. The track descends to the beach at both ends and trampers walk along the beach between. There is also a hunters camp site; some recreational hunting is carried out. Rubbish around camp is a minor problem (all pers obs).

Existing Protection:**Type and Comment:** a

The middle section of the beach abuts Anglem Nature Reserve and the surrounding area is stewardship land under DOC control. Permits are not required at present to enter the Nature Reserve here (pers obs 1990).

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

There is little specific information on this area.

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - ③ PNA The Anglem Nature Reserve is recorded
 - 4 Geopreservation
 - ⑤ HPT County Inventories 1986
 - ⑥ Other Hugh Wilsons dune inventory, DOC unpublished record
 - 7 None
-

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Northern Titi Islands

Site No: 140020

Recorders Name: Jane Hare / S King

Conservancy: Southland

Map/Grid Ref: E48 21470 53630

Date: 13 March 1990

Brief Description of Site:

These islands lie in the eastern part of Foveaux Strait approximately 8 to 15km from Halfmoon Bay, Stewart Island. They range in size from 9 ha (Womens and North Islands) to 48 ha (Motonui). The islands - North, Womens, Edwards (Motonui), Jacky Lee, Herekopare, Kanetetoe and the Bunker Islets - are all Maori owned; most are regularly designated Titi islands except Kanetetoe, and are birded by their owners for titi (sooty shearwaters). They are part of a chain of islands lying on a ridge across Foveaux Strait between the Neck on Stewart Island and Waipapa Pt. Several aerial stacks also occur in their vicinity. These islands represent remnants of a drowned landscape (Cullen, 1967). Their vegetation is mainly coastal *Olearia* scrub and grasses (Wilson 1987). Coastlines are rocky, with steep platform rock, rough broken boulders, also boulder beaches (pers obs).

Conservation Values:

Natural: abcdeh

Cultural: abc

Historic: bd

Comment:

All these islands have a high degree of naturalness. South Island saddleback (an endangered species Bell, 1986) have been transferred to, and are surviving on several of these islands - North, Womens, Edwards and Jacky Lee; these islands are rodent free. Other bird species of interest are Stewart Island fernbird (regionally threatened) (North, Womens) St Is weka (also regionally threatened) (North, Womens, Edwards, Jacky Lee, Herekopare, Bunkers) and the rare yellow-eyed penguins (Edwards, Jacky Lee, Herekopare, Bunkers). Petrels, shearwaters and shags breed on all the islands (A Roberts pers comm). Herekopare is reported to have an endemic species of giant weta *Deinacrida caraniata* (A Roberts pers com); the conservation status of the weta is threatened (Bell, 1986). Punui (*Stilbocarpa lyallii*) a plant (vulnerable Wilson and Given 1990) grows on North, Womens, Jacky Lee, Herekopare and Bunkers, and Cooks scurvy grass (vulnerable Wilson and Given 1989) on all but Bunkers and Edwards (H Wilson pers com) (which needs a field check). Fur seal breeding colonies are located on Bunkers Herekopare and Jacky Lee, Womens, North and Edwards) (Wilson 1981; King 1990; A Roberts (pers comm). The islands are vulnerable to the introduction of rodents and other animals which would severely modify their high natural values (A Roberts pers com). These islands are of national importance because of their wildlife, and predator free status (Ibid).

An interesting submarine geological feature, a broad clearly defined submarine valley named the Rakiura Gap (by Cullen, 1967), lies on a gently curved axis between Edwards Island and the Lachlan shoals off Ruapuke. To the east of the islands is a narrower, tortuous valley system which is probably a continuation of the drowned and silted up river system that is now Paterson Inlet (Ibid).

The benthic fauna of the seabed around the islands is of interest because the islands lie within that part of Foveaux Strait in which Bluff oysters occur in medium density. Several small areas recognised as important oyster beds occur around them (see Human Use map, supplied by J Cranfield). Water clarity around the islands is very high and brown algae occurs as deep as 22m. Some interesting marine algae present including *Cystophora congesta* (pers obs).

These islands have high cultural value as Titi islands, although Bunkers is not presently birded. They are all an important element in any view of eastern Foveaux Strait, and as bush covered, unmodified islands with small clusters of houses, have aesthetic appeal (pers obs, NZ Forest Service et al 1978).

All these islands must have Maori archaeological value even though only one site is recorded on the HPT register. The tradition of birding has been carried out for centuries (H Ashwell pers comm). Sites are probably not recorded because of the strict limited access to the islands. The 1 recorded site is a shipwreck site on Edwards Island. Also of historical interest are the nearby oyster beds from which oysters were dredged and, held alive in holding ponds at Leasks Bay, Stewart Island before shipping to Bluff c1900 (Howard, 1974). There was a fish receiving shed on Bunkers Island from 1864 to 1868 (Ibid).

There is a Maori legend as to how the islands in Foveaux Strait were formed - they were fragments dropped or spat out by Kiwa the whale as he widened Foveaux Strait (Beattie 1949).

These islands have very high conservation values.

Site Importance: International National Regional Local Unknown

Comment:

The islands with saddlebacks (North, Women's Edwards and Jacky Lee) are of international importance. As rat free islands, with or able to support populations of South Island saddlebacks, and because of the presence of the rare plants punui and Cooks scurvy grass they are nationally important. They are also of national importance as cultural sites as the traditional muttonbirding industry is unique.

Existing Threats:

Type and Comment: cdik

The invasive plant montbretia is present on Womans and North Islands. The threat of rodent invasion or the deliberate introduction of mammalian predators eg cats, is a continual concern. Commercial fishing is carried out around these islands and paua stocks in particular have been drastically depleted (all pers com). Recreational diving and fishing also occurs; of greatest concern is the harvesting of large crays both recreationally and commercially especially from Kanetetoe, one of the last areas remaining in Foveaux Strait with a good population of large resident crayfish (pers obs, M Whipp, pers com).

Human Modification and Human Use: ji

As Titi Islands these islands are used by Maoris during the Titi season (April/May) for the traditional titi harvest. Modifications include the building of huts and facilities, tracks and occasionally fire damage as on Herekopare Island; kaimoana has traditionally been gathered from around the islands during the titi season (H Ashwell, pers com). Historically, the first Foveaux Strait oyster beds used, lay to the east of the islands. These were fished by Stewart Island boats until seriously depleted then the industry moved further westward (Howard, 1974; Wilson 1979).

Existing Protection:

Type and Comment: ai

Kanetetoe is unallocated crown land presumably, also Zero Rock. The other islands are either Crown (a) or beneficial (i) Titi Islands, and are administered under the Titi Regulations. They are covered by a separate Muttonbirding Zone of the Stewart Island District scheme. Existing protection is probably adequate but depends on the goodwill of the owners. Entry is restricted to between 15 March and 31 May each year and then only those with inherited birding rights and their spouses and children may visit the islands (Titi Islands Regulations, 1978).

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

There is little detailed information because of restricted access to the islands.

Sources of Information:

Natural	1	②	3	4	⑤	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Records of dive transects and spot dives around the island are held by DOC
 Merv Whipp, charter boat operator, Halfmoon Bay
 Harold Ashwell, Bluff, Secretary, Rakiura Maori Land Incorporated
 A Roberts, Conservation Officer, Stewart Island

Recorded on Existing Databases: Comment:

1	WERI	
2	SSWI	
3	PNA	
4	Geopreservation	
⑤	HPT County Inventories	1986
⑥	Other	DOC databases with some information are CMID and the Islands being developed.
7	None	A map of rare plant locations supplied by Hugh Wilson, Banks Peninsula.

Other Considerations:

The Titi Islands Regulations 1978 are administered by an annually elected Titi Committee, chaired by the Regional Conservator, Department of Conservation, Southland.

Site Names: Ruapuke

Site No: 140021

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: F47, 48 21670 53730

Date:

Brief Description of Site:

The Ruapuke group comprises the main island Ruapuke (1470 ha) and several islets, rock stacks and shoals scattered around to a radius of 8km. The largest of these are Green Island to the west and Bird Island to the east. The main island is a large flat irregularly shaped land mass which dominates eastern Foveaux Strait. These are all part of a chain of islands and stacks lying on a ridge across Foveaux Strait from Waipapa Pt to the Neck on Stewart Island; these represent remnants of a drowned landscape. There are several lagoons on the main island fringing a remnant of coastal podocarp forest. The coastline is podocarp alternating sandy beaches and rocky headlands. Ruapuke Islands has been modified by centuries of human occupation and is farmed, but the islets are still largely natural. All the land in the group is Maori reserve and is not commonly visited except by the owners (K Morrison, R Kerr pers com).

Conservation Values:

Natural: abcde

Cultural: abcd

Historic: abcd

Comment:

Ruapuke Island is largely modified but Bird and Green Islands and th islets remain in a natural state. The lowland forest on Ruapuke Island is a habitat for threatened bird species - yellow - crowned parakeet and SI kaka have been reported from here (Ball et al, 1985). It is also a fragile remnant vulnerable to browsing by possums and damage from feral pigs. Moana Putakitaki Lagoon which is surrounded by flax and reed swamp is habitat for ducks, and an unknown species of fernbird which is locally threatened (Kim Morrison pers com). Te Awatuiiau Lagoon is a feeding and roosting area for wading birds and other threatened bird species present are variable oyster catchers, reef herons, Stewart Island shags and banded dotterels (Ibid). Little blue penguins breed at South Pt, and yellow-eyed penguins at North Head. In Henrietta Bay are unusual granite knobs and standing monolithic stones (Kerr, Morrison, pers com). Punui, which is a rare plant (Wilson and Given 1989) is present at Henrietta Bay and on Bird and Green Islands (Wilson dune inventory and pers com). Pingao also rare (Wilson and Given 1989) is present at most of the main island's beaches despite the increasing presence of marram (Wilson's dune inventory). The coastline of Ruapuke is closed to the commercial take of paua, so there are probably still reasonable stocks of this species left, unlike around much of the adjacent Southland and Stewart Island coast (personal assumption). Around the island are beds of Bluff oysters (*Ostrea* sp) on medium to fine sandy pebble gravel (Cullen, 1962). Part of this area is the MAFfish oyster research area; it is closed to commercial oyster harvest.

Ruapuke has long been a southern gathering ground for Murihiku Maoris. There are numerous archaeological sites on the island. The pa, Parakiaio was probably constructed at the time of Te Rauparaha's uprisings when he took Kaiapoi and Onoare and was moving south. Ruapuke was the base of Tuhawaiki, chief from 1835 and later paramount chief of the South Island (Hall-Jones 1979). There are burial sites on the point (Morrison pers comm). John Boulton reports that the island was used as a potato growing area and to run pigs; when he visited around 1826 there were about 60 houses present (Starke 1986). The cannon in Henrietta Bay was probably purchased in Sydney by Tuhawaiki. The Maori settlement was at Henrietta Bay; there are local burials and a Maori cemetery here (Hall-Jones 1989). The island has considerable spiritual values to the the Maori descendants who now own it. This area was also the site of the church, house and flour mill established by a German Lutheran missionary the Reverend Wohlers who live with the Maoris from 1844-85; with his wife and daughter. Photographs still exist of the house and church. A short-lived whaling station was established on the island by Bluff fish merchants in 1895 (Howard, 1974). The Bluff tug Awarua was sunk as an artificial reef off the Break Sea Group of Islands in 1989. (R McConnon, pers comm). Several older wrecks occurred around the

island, although whether any remains are left is unknown. They span the period 1873 - 1962 (Ingram, 1984).

There is a Maori legend as to how Ruapuke and the other islands in Foveaux Strait were formed - as fragments left when Kiwa the whale widened Foveaux Strait (Beattie, 1949)

The islands have landscape value. Ruapuke is the largest island in eastern Foveaux Strait and dominates the view of this area. The shore and lagoons have aesthetic value (R Kerr pers com).

Site Importance: International **National** Regional Local Unknown

Comment:

Culturally historically this site has at least regional importance as the only Maori-occupied island in the south of New Zealand. The rare plants on Birds and Green Island are of national importance.

Existing Threats:

Type and Comment: cdi

Pastoral farming and burning off is a threat to the remaining coastal land values. The possums and pigs threaten the forest structure and its value as a habitat for bird species (K Morrison, pers com). The remaining pingao is threatened by the presence of introduced marram (Wilson's dune inventory). The main threat to the marine values is the exploitation of paua stocks from paua poachers or recreational take (concerns expressed at public meetings by Maori landowners). Ruapuke is subject to heavy diving and lining activity which is mainly unpoliced (MAFFish) report in DOC Southland Resource Inventory RI 375).

Human Modification and Human Use: aj

The area is farmed by its Maori owners. The adjacent coastline is fished for crayfish and cod from both Bluff and Stewart Island. Green Island and Bird Island are reported to be harvested regularly for titi although these islands are not listed as birding islands in the Titi Regulations. (M Whaitiri pers com). Aquaculture of paua is a proposed use (pers com).

Existing Protection:

Type and Comment: dif Islands are Maori reserves.

1. Fisheries regulations prevent the commercial take of shellfish including paua and oysters within 1 mile seaward of Ruapuke and Green Islands.
 2. The Southland Skindivers Club has placed a voluntary protection zone around the Awarua (R McCannon pers com). Both these restrictions are difficult to police (MAF RI).
 3. The commercial take of oysters is prohibited in the MAFfish research area - that within a straight line from North Head Ruapuke to Seal Rock to West Pt and along MHW to the point of commencement.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	⑥	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

The coastline of Ruapuke merits further investigation because of the wealth of reefs and rocky islets. Naina Russell, Wicklow Street, Clifden and Maida Barlow are suggested contacts.

Rodney McCannon, Southland Skindivers Club

Kim Morrison, McAndrew Bay, Dunedin

Ross Kerr, TE Anau Field Centre, DOC

Mason Whaitiri, Bluff, Maori landowner

John Cranfield, MAF Research, Greta Point

Recorded on Existing Databases: Comment:

- ① WERI Ruapuke 1983
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- ⑤ HPT County Inventories 1986
- ⑥ Other - Hugh Wilson's draft dune inventory, DOC unpublished record
- 7 None

Other Considerations:

Ruapuke and the islets is not regarded as part of New Zealand by Ngai Tahu kaumatū Robert Whaitiri of Bluff, as it was not sold to the Crown.

Site Names: Paterson Inlet

Site No: 140022

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: D48, E48 21350 53530

Date: 13 March 1990

Brief Description of Site:

Paterson Inlet is a shallow, almost completely enclosed body of water opening from Stewart Island's east coast onto southeastern Foveaux Strait. Sixteen km long it encloses 100 square kilometres of water and several islands. The shoreline is principally of granite and diorite broken rock and platforms; along the southern shore is a zone of crushed schist (Watters et al 1968). Pocket beaches of sand, and tidal estuaries, with eelgrass flats are common. At the inlets head two rivers, the Freshwater and the Rakeahua, converge; here there are extensive intertidal mudflats crossed by narrow tidal channels. These rivers carry minimal loadings of silt and the low sedimentation rate is thought to have an important influence on the Inlet's marine life, which has a diversity and richness of habitats and communities (Grange and McKnight 1987; Hare 1990). The shores of the inlet are forested with podocarp forest, and on coasts exposed to the prevailing W and SW winds, coastal scrub. The inlet is a ria - an ancient drowned river system that has been submerged (Cullen 1967).

The only settled area occurs along the north-eastern shore at Golden Bay and Ringaringa.

The Neck is considered as a separate site, as is Ulva Island.

Conservation Values:

Natural: abcgh

Cultural: abce

Historic: abcd

Comment:

Few of New Zealand's inlets remain in a natural state; despite historic sawmilling settlements along the northern shore, and moderate recreational use, Paterson Inlet has. The catchment areas are still forested, sediment loadings are low, the water quality and clarity is high; so too is the diversity of habitats and life forms (pers obs; Hare 1990).

The inlet also has a variety of natural landscapes and of land forms, from the exposed outer coastline to the sheltered eelgrass flats. Of the flora, the most notable occurrences are punui *Stilbocarpa hyallii*, rare on New Zealand's mainland islands, of which there is a remnant population at Ringaringa, also pingao which is common on the Native Island dunes despite the marram present. Punui and pingao are both rare plants (Wilson and Given, 1989). The Bravo Islands are of particular interest because they are little modified by deer (Wardle et al 1978). The inlet is known for its abundance of wildlife, easily seen. Sixty-seven species of birds have been recorded using the inlet (Hare 1990). It is the southernmost destination, along with Pegasus of northern migrant waders such as godwits, knots and golden plovers. Local rare and threatened (Bell, 1986) species present include variable oyster catchers, Stewart Island shags, yellow-eyed penguins, which all breed there, also moulting Fiordland crested penguins, reef herons, NZ dotterels, banded dotterels, Stewart Island wekas, SI kaka and Australasian bitterns in the Freshwater area. Large numbers of waders and waterfowl feed and roost in the mudflat areas which contain large populations of cockles and mud-dwelling fauna (Hare, 1990).

A number of endemic snails are known from the Native Island dunes.

Giant kokopu a threatened fish (McDowell 1978) inhabit the Freshwater and Rakeahua Rivers (Chadderton, pers comm).

Dolphins (bottle-nosed and occasionally dusky) are often seen feeding in the inlet. Fur seals are frequently seen in small numbers especially around Ulva's western end (Wilson 1981, King 1990) and Hookers sealions are occasional visitors.

Several features of Paterson Inlet's marine life have been recognised in scientific papers as unusual -

- the *Lenormandia chavini* red algae meadows (Roper et al, 1988)
- the abundance of echinoderms (Batham, 1969) and
- the brachiopod communities; (Richardson, 1981).

Of greatest scientific interest are the brachiopods. Much of the outer area contains an assemblage of *Neothyris lenticularis* - *Terebratella sanguinea* which have adapted to a unattached habit, lying atop the soft sediment, often in very dense numbers. This assemblage is not known from anywhere else (Hare 1990). The rhynchonellid brachiopod *Notosaria nigricans* is also common as is *Terebratella inconspicua*, including at very shallow depths. These species can be found at very shallow depths (Thayer 1990, Hare 1990).

These brachiopods are of considerable scientific interest, the more so because they can be studied with scuba gear in their natural habitat and because they're important in marine evolutionary studies (Queen Elizabeth II Trust, 1978 Richardson 1981a and b, Grange and McKnight, 1987, Thayer, 1990).

The inlet is also an important habitat and nursery area for marine fish and because they are important in marine evolutionary studies. Fifty six species have been recorded. Blue cod abound, particularly around reefs and islands in the outer inlet. The many estuarine areas are important nursery sites; spotted spiny dogfish spawn in the Inlet waters (Hare, 1990).

The marine algae of the inlet is also extremely rich and diverse (Hare 1990); Ringaringa is well known among phycologists as a collecting site particularly for red algae (M Parsons, pers comm). An unusual free-lying form of *Macrocystis pyrifera* occurs in the sheltered upper arms as at Kidney Fern (Gerard and Kirkman 1984). Both several species (brachiopods and bryozoans in particular), and the marine benthic community of the inlet as a whole are not adapted to withstand increases in sedimentation (Grange and McKnight 1987, Grange pers comm).

Several features merit further study - red algae reef communities (Morton and Miller 1968, Hare 1990), *Rhodomenia* dominated algae communities on subtidal mud sediments in particular (Hare, 1990). The inlet is one of the last areas of Stewart Island with a reasonable stocking of paua as it has been closed to commercial take for several years. MAF fish have monitored juvenile crayfish in the inlet for several years (John Booth, pers comm). Giant kokopu, a threatened freshwater fish live in both Rakeahua and Freshwater rivers and possibly other local streams. Trout are not present, so the stream fauna is in a highly natural state (Chadderton, pers comm).

Maori middens are present on almost every beach on Paterson Inlet (pers obs and R Tindal pers comm) but little is recorded about the Maori use of the area. Sondages dug on the Ringaringa Peninsula indicated periods of occupation; moa-egg shell fragments were found here. Ringaringa was a site from which bull kelp was traditionally harvested for kelp bags (Kelly Davis pers comm). There were small Maori settlements on Bravo Island and Native Island (also The Neck - site No. 24). An ancient kaika in Paterson Inlet was Te-ara-o-te-kaha (submission on Southern Coasts Package 1989). There was a turanga waka (canoe landing site) in the vicinity of the Freshwater River mouth (H Ashwell pers comm). Much of the European use of the inlet centred on the Neck and Ulva (Site No. 24). From 1861 several sawmills operated around the northern shore and later at Big Glory and Hapuatuna. Small boat building activities were common around this time also (Howard, 1974). A monument to Rev. Wohlers of Ruapuke is at Ringaringa, near his grave site on the point. A more recent venture was the use of Prices Inlet as an overwintering and repair base for Norwegian whale-chasers in 1926-32; the mother ship, a pelagic whaler in the Ross Sea returned to Norway each winter (Watt, 1989). Many relics remain at the base site and the buildings were relocated to Bravo and Halfmoon Bay (pers obs).

Shipwrecks which still remain in the Inlet are the Othello the pontoon used at Whalers Base, also the Kotare (1931) in Little Glory and the Pacific (1864) off Pipi Rocks (Watt, 1989; Ingram 1984). Whilst the landscape of Paterson Inlet is complex in character with considerable diversity; it all has moderately high to high values. (Petrie) 1989. A site commonly used for shore studies is Ringaringa (pers obs).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

As an integral part of the Stewart Island ecosystem both land and sea (NZ Forest Service, 1978; QEII Trust 1978, Wilson, 1987; Grange and McKnight, 1987) the brachiopods are important to a wider international scientific community and are in the IUCN listings.

The yellow-eyed penguins are of national importance.

Existing Threats:

Type and Comment: acdfhikm

The main threats to Paterson Inlet are to the marine environment, in particular aquaculture. The salmon farms, which are restricted to Big Glory have demonstrated adverse threats to the surrounding marine habitats and communities, on wildlife, on the landscape, and water quality. These are reasonably well known or documented well (particularly in Roper et al 1988; SUC, 1989). In particular any increase in sedimentation such as from salmon farms threatens nearby brachiopod communities (Hare, 1990) and probably also increase the likelihood of algal blooms.

Other threats to the inlet are the depletion of natural shellfish beds - of scallops because of high legal take (recreational) including dredging, and of paua because of commercial poaching. Destructive and bulk fishing such as trawling and set netting are also of concern (pers obs and concerns expressed by many locals) as is recent extraction of geoducs by sluicing of the sea bed (pers obs). Threats to the land include marram on all the beaches, and widespread deer and possums everywhere except on the Bravo Islands, Ulva and a few smaller islands. Gorse is present in small areas (pers obs).

There is a population of escaped salmon living in the inlet. The presence of a wild salmon parr in the upper Rakeahua (found by L Chadderton in 1989) is of great concern; if the population of escaped salmon around the inlet breed in the rivers in quantity, much of their natural values would be modified (Chadderton, Tindal pers comm). Set netting for craybait around the outer Ringaringa - Evening Cove area threatens reef fish here (pers obs).

Small land slips occur along the southern shore of the inlet. The cliffs at Ringaringa are severely eroding (pers obs).

Human Modification and Human Use: adih

The logged areas around the northern shore are regenerating well (R Tindal pers comm). Along in northern shore at Golden Bay - Thule there is a concentration of houses and cribs; these nestle in the bush and don't detract significantly from the area's scenic quality. A small area at Ringaringa is farmed. There is extensive recreational use of the inlet, both shore and water-based from locals, holiday makers and casual tourists on charter boat trips. Hunters camps are scattered along the southern shore and the huts at North Arm and Freds Camp are part of the main tramping circuits. Small scale gravel extraction occurs on Bravo Island (pers obs).

Water classifications are in place (McKenzie, 1983).

Boats moore at Thule, Vaila Voe and Golden Bay; there are several boat sheds here. Aquaculture is confined to Big Glory Bay and includes salmon and mussel farms - 20 licences altogether.

Existing Protection:

Type and Comment: adi

- 1 Scenic Reserves are Rakeahua, Pryse Peak, Glory Cove, Paterson Inlet Islands, Kaipipi, Raroa, Deep Bay, Ackers Pt, Native Island (part of the island only).
- 2 There are several small areas of freehold land and Maori land particularly centred on the northern shore to Prices Inlet. The remainder is stewardship land.
- 3 The above areas have marginal strips along the coast.
- 4 Commercial take of shellfish and kina (but not crayfish) is prohibited within Paterson Inlet by Fisheries Regulations.
- 5 Much of the northern shoreline to Kaipipi has unformed legal road along the coast.
- 6 Aquaculture on Stewart Island is confined to Big Glory Bay by gazette notice of the Minister of Fisheries.

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

There is an extensive draft CRI report on Paterson Inlet prepared in 1989 by J Hare and W Costello. This includes maps.

Murray Parsons, DSIR herbarium, Lincoln

Ken Grange, NZ Oceanographic Institute, Wellington

Kelly Davis, MAFfish contract worker, Dunedin; resident in Oamaru

R Tindal, ex District Conservator, Stewart Island, Halfmoon Bay

Lyndsay Chadderton, Dept of Zoology, Canterbury University

Harold Ashwell, Rakiura Maori Land Incorporated, Bluff

John Booth, MAF Research Centre, Greta Point.

Recorded on Existing Databases: Comment:

- | | | |
|---|-------------------------------|---|
| 1 | WERI | Abrahams Bay 1981, Freshwater mudflats and river 1982, Lower Freshwater River Big Glory Bay 1981, Rakeahua River 1985, North Arm 1985, Prices Inlet 1979, South Arm 1985. |
| 2 | SSWI | |
| 3 | PNA | - the reserves only |
| 4 | Geopreservation | |
| 5 | HPT County Inventories | 1986 |
| 6 | Other | - Hugh Wilson's draft inventory of Stewart Island dunes, unpublished DOC record 1981. |
| 7 | None | |
-

Other Considerations: The inlet is part of on a taiapure area proposed by Rakiura Maori Land Inc, documented by Harold Ashwell. Southland Conservancy, DOC, also intend proposing part of it as a marine reserve site.

References**Accompanying Maps and Photographs:**

Site Names: Ulva Island

Site No: 140023

Recorders Name: J Hare/S King

Conservancy: Southland

Map/Grid Ref: E48 21390 53530

Date: 13 March 1990

Brief Description of Site:

Ulva Island is a prominent landscape feature in the entrance to Paterson Inlet. It is of elongated shape, 3.5 km long of medium low relief (260 ha). The shoreline is irregular with three major beaches, rocky shores, and several small enclosed coves with eelgrass flats. The island is forested with tall coastal podocarp forest and a fringe of coastal scrub on the western end which bears the brunt of westerly winds (Meurk and Wilson, 1989).

Ulva Island is a popular destination for day trippers on charter boats, for picnicking and bush walking (pers obs).

There is a public wharf and walking tracks. A crib is sited on a small area of freehold land.

Conservation Values:

Natural: abc

Cultural: abce

Historic: abc

Comment:

Whilst tracks traverse much of the island, and there is a holiday home on a small area of freehold land at the Landing, Ulva Island still retains a high degree of naturalness. Deer were removed from the island several years ago and the vegetation is recovering. Possums aren't present and the only rats are Norway rats, present in very low numbers (A Roberts pers comm). The island is one of the few accessible places where birds such as the Stewart Island Weka, Stewart Island kaka (both regionally threatened) yellow fronted parakeets and brown creeper can be seen. Stewart Island Kiwis have been introduced and are present in low numbers (A Roberts pers comm). Ulva Island has a valuable education role; it is commonly used for guided walks, school trips and local picnics. It also has the potential to support rare and vulnerable species such as South Island saddleback as the rats are eradicable. (A Roberts pers comm). Ulva's coastline is used for both breeding and feeding by wading and waterbirds such as variable oystercatchers, Stewart Island shags (both rare), white-fronted terns and little blue penguins. These statements are all personal observations of the authors (or A Roberts pers comm as noted). The Conservation status of the birds is from Bell, 1986.

Ulva also has a rich flora of orchids (R Tindal pers comm). Fur seals use the western rocks to haul out and Hookers sealions have been seen on Sydney Cove.

The rocky subtidal area of Ulva Island contains a variety of communities; probably of greatest interest is the eastern end where a rich bryzoan fauna and brachiopods *Notosaria nigricans*, and *Terebratella inconspicua* exists (Willan, 1981). Diverse marine benthic assemblages including brachiopods occur around the islands at the western end (pers obs).

Although no Maori archaeological sites are recorded on the island, a Maori presence is indicated by de-barked totaras; the bark was probably used in the manufacture of titi storage bags (pers obs).

Ulva was settled in 1870 by Charles Traill, who opened a general store and a Post Office, the first on Stewart Island. This building is still standing. Traill also planted a variety of trees, one of which a *Pinus radiata* planted in 1872 is now historic, one of the oldest radiatas in New Zealand. Even in those years Ulva was a popular tourist destination. There is also a Traill family cemetery here (Howard, 1974).

The island is a strong focal point seen from many of the major viewing points around the inlet. It has high natural quality and aesthetic appeal (Petrie, 1989).

Site Importance: International **National** Regional Local Unknown

Comment: hi

As part of Paterson Inlet, this site gains national importance as it is an integral part of that ecosystem, (NZ Forest Service et al 1978, QEII Trust 1978, Wilson 1987, Grange and McKnight 1987) also because of its potential use as South Island saddleback refuge.

Existing Threats:

Type and Comment: cd

Marram and gorse, present in low numbers at Sydney Cove are easily eradicable. Deer are able to swim across from mainland Stewart Island and there is a need to monitor the island. Current levels of recreational use pose no real threat to the island's natural values (pers obs).

Human Modification and Human Use: hia

Ulva is used mainly for recreational purposes, hence the provision of a wharf, picnic shelter and tracks. A holiday house near landing, where original buildings still stand, is well-used. Moorings exist alongside the wharf in the Landing Bay. Ulva is a popular diving site (various submissions to Southern Coast Package 1989 eg Southland Skindivers Club) and cod are commonly caught from dinghies around its shores.

Existing Protection:

Type and Comment: a

- 1 Ulva Island Scenic Reserve (259 ha)
 - 2 A small area of freehold land at the landing is fronted by a marginal strip.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:

Andy Roberts, Conservation Officer, Department of Conservation, Stewart Island
 Ron Tindal, ex District Conservator, Department of Conservation, Stewart Island, now Halfmoon Bay.

Sources of Information:

Natural	1	2	3	4	5	6	7
Cultural	1	2	3	4	5	6	7
Historic	1	2	3	4	5	6	7
Threats	1	2	3	4	5	6	7
Human Mod. & Use	1	2	3	4	5	6	7

- 1 Derived information from existing literature and databases.
- 2 Derived information as above and field check.
- 3 Derived from existing maps and aerial photographs.
- 4 Recent DOC survey including sampling and analysis.
- 5 Recent DOC survey excluding sampling and analysis.
- 6 Experience.
- 7 Expert Opinion.

Comment:

Andy Roberts, Conservation Officer, Department of Conservation, Stewart Island, now Halfmoon Bay.

Recorded on Existing Databases: Comment:

1	WERI
2	SSWI
3	PNA - Ulva Island Scenic Reserve
4	Geopreservation
5	HPT County Inventories
6	Other
7	None

Other Considerations:

The coastline around Ulva Island is part of a marine reserve that the Department of Conservation intends to propose. It is also part of a taiapure proposal documented by Harold Ashwell for Rakiura Maori Land Incorporated (1990).

Accompanying Maps and Photographs:

Site Names: The Neck, Stewart Island

Site No: 140024

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E48 21430 5350

Date: 13 March 1990

Brief Description of Site:

The Neck is a long peninsula extending about 6km northward from Glory Cove towards the entrance of Paterson Inlet, which itself lies between its northern extremity of Bullers Pt on the Neck and Ackers Pt of Halfmoon Bay. At high tide, the sea washes through the large sandpit called the Old Neck, which divides the Neck peninsula into two land units. Much of the northern area has been cleared for rough pasture and some is reverting to gorse, manuka and ultimately forest (pers obs). At the southern end, the Ocean Beach - Little Glory area is an ancient wave platform (Cullen, 1967). The Neck was formerly a large Maori/European settlement, but when Stewart Island was sold by its Maori owners in 1864 it was reserved for the use of local Maoris, and Halfmoon Bay became the centre of European activity (Howard, 1974). The shoreline of the Neck is irregular and includes several long land beaches, broken rock shores, large reefs at Pipi Rocks and Bullers Pt, and around the extremely exposed northern tip, huge boulders and platform rocks fringed by bull kelp and washed by large swells (pers obs).

Conservation Values:

Natural: bc

Cultural: abc

Historic: bcd

Comment:

The dune area at the Old Neck is heavily modified by marram. Some pingao (locally rare Given 1990) remains here and possibly also near the Bullers Point area. On the spit is also the vulnerable plant *Euphorbia glauca* (Wilson and Given 1989) as a colony growing along the foredunes (pers obs). The dunes and wide sand flats provide feeding habitat for waders such as the threatened banded and New Zealand dotterels; and are also roosting areas for a flock of around 300 bar-tailed godwits (pers obs). (S King pers comm; Wildlife submission to NZFS et al) Stewart Island kiwi feed around the Ocean Beach area and (rare Bell 1986) yellow-eyed penguins use (P Johnston pers comm); (rare, Bell 1986). Wildlife submission to NZ Forest Service et al). Stewart Island kiwi feed around the Ocean Beach area (rare, Bell 1986) and yellow-eyed penguins use the outer coast (P Johnson pers comm) (rare, Bell 1986). The coast around the Neck has several interesting marine features including extensive beds of pauas and inshore scallop beds. The Bullers Point reef has rich beds of diverse red algae and is probably the source of much of the driftweed on Ringaringa (pers obs) which is a collecting site for seaweeds, well known among phycologists. The inshore area also have large beds of *Macrocystis* bladder kelp, with associated reef fish, some rock oyster (*Ostrea* sp) habitat.

The earliest known Polynesian settlement in the south of New Zealand is on the Old Neck. Excavations in 1960s by archaeologist Les Lockerie revealed seven strata each representing differing occupations and separated by around 1 foot of sand. In the lowest layers were implements and ornaments typical of the Southern "Moa hunter" period; moa bones were also uncovered. Carbon dating of an ancient material dated the material at AD1270 +/- 60 years; which was not necessarily the earliest date of occupation (ODT, 3/20/61).

From the commencement of exploitation of the Foveaux Strait grounds by sealing gangs the northern end of the Neck was visited by sealing vessels and a mixed European/Maori settlement formed by early whalers and sealers. A school was opened in 1875. Two wrecks are known from the Neck - the Tarawera sunk in Lowrys Bay as a breakwater and the Pacific off Pipi Rocks (Ingram, 1984). There is an urapa here (H Ashwell pers comm).

Both The Neck itself and the spit are visible from much of Paterson Inlet's viewing points; the spit has moderately high landscape values because of this and its unique colour, texture and scale. The remaining signs of European settlement on The Neck are a positive cultural element in the landscape (Petrie 1989).

Site Importance: International National Regional Local Unknown

Comment:

The inshore area of this site is an integral part of the Paterson Inlet ecosystem which is of national importance as a whole: (NZFS 1978, QEII Trust 1978, Wilson 1987, Grange and McKnight 1987). The spit on the Old Neck is of national importance because of its use by NZ dotterels for its value.

Existing Threats:

Type and Comment: cdim

Marram is threatening the biological values of all the beaches especially the little pingao that remains. Gorse is common on the headland but will probably die out as the forest regenerates. Wilding macrocarpas are present which may spread. Farm animals, cattle and sheep wander through the bush to the shore in several places, as do deer and possums. Rubbish on the Little Glory beaches is a problem and threat to wildlife. This area appears to collect much of the rubbish from the salmon farms. (All personal observations) Paua poaching occasionally occurs along the inner inlet shore (D Landon pers comm).

Human Modification and Human Use: adhi

Past modification occurred through burning and land clearance, farming attempts and settlement.

The Neck currently has three houses on the northern end, one of which is occupied a considerable part of the year. Cattle, sheep, and a few goats are farmed on rough pasture. There is a wharf at Little Glory, and a track to Ocean Beach which is reasonably well used, as is a hunters campsite at the head of Little Glory. Paua, scallops, and crays are regularly dived for, by diving parties on charter boat trips, or with their own boats. Several small grave yards are dotted around the Neck (all pers obs). Moorings for small boats off Lowrys Beach.

Existing Protection:

Type and Comment: adi

1. Marginal strip around the coastline of the Maori/freehold land.
 2. The Spit is stewardship land.
 3. Little Glory Scenic Reserve at the southern end of the peninsula.
 4. The inner Inlet shore to be closed to the commercial taking of shellfish and kina under Fisheries Regulations.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	1	②	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Dick Langdon, paua diver, Stewart Island. Murray Parson, DSIR herbarium, Lincoln.

Recorded on Existing Databases: Comment:

1	WERI	
2	SSWI	
③	PNA	Little Glory Scenic Reserve only
4	Geopreservation	
5	HPT County Inventories	
⑥	Other	- Hugh Wilson's draft dune inventory, unpublished DOC records
7	None	

This area is part of a taiapure area proposed by Rakiura Maori Land Incorporated and documented by Harold Ashwell. DOC also considers it worthy of marine reserve status and this has been suggested by Merv Whipp, charter boat operator, Stewart Island.

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: SE Stewart Island Bench Is. to Lords River Site No: 140025

Recorders Name: Jane Hare / S King

Conservancy: Southland

Map/Grid Ref: E48, E49 21450 53460

Date: 12 March 1990

Brief Description of Site:

This site extends from Bench Island and Whero Rock in the north, along the south-east coast of Stewart Island to Lords River mouth, an area approximately 48 km long (The Neck and Port Adventure are excluded, being sites 24 and 26 respectively). Seaward, this site abuts the Foveaux Strait shelf in the north and the Eastern Stewart Island shelf in the south where the change in slope at the shelf edge occurs at around 75m depth. The coastline is a repeating sequence of small sandy bays with forested backdrops and windswept rocky headlands of granite and coastal scrub (King et al 1985). This eastern portion of Stewart Island is an old eroded surface sloping gently eastward with typical drowned topography (Cullen, 1967). The shore is exposed to the south and east but sheltered from the predominant westerly storms. The area is in the lee of the Southland current flowing north across the shelf (King et al 1985). The tides meet at East Cape (A Gray pers com). In the south several islands shelter the entrance of Port Adventure and Tikotatahi Bay; the Breaksea Islands south of Shelter Point, Weka and Tia Islands off Port Adventure and Pihore Island in Chew Tobacco Bay. Two reefs lie well off; Weka Reef off Starling Head and Wreck Reef off Shelter Point.

Conservation Values:

Natural: abcdg

Cultural: abc

Historic: abc

Comment:

The islands in this zone are breeding sites for seabirds, in particular petrels, shearwaters and in some cases yellow-eyed penguins (pers obs). The latter have been reported from Bench and Owen Islands and probably also use Tia, Weka and the Breaksea Group. They also nest at Ocean Beach, Chew Tobacco, Pikaroro, Lords River and possibly Shelter Pt and Tikotatahi (pers obs G Fife pers com). Shags and petrels breed on Bench Island and probably the other islands (Richdale Guthrie-Smith). Fur seals breed on the islands and also haul at Shelter Pt, John Pt and East Cape (pers obs). Rare plants, punui *Stilbocarpa lyallii* and Cooks scurvy grass *Lepidium oleraceum* are found on some of the islands (Wilson pers com). The rodent status of some of these islands is uncertain although rats are known to be on most, but not other mammalian predators (pers obs). The ornithologist, Richdale, monitored sea bird colonies on Whero Rock for several years; Forest Research Institute is assessing and monitoring deer and opossum numbers and the extensive coastal forest die back along the coast and on Bench Island (a deer and possum - free control island) (Stewart and Burrows, 1988).

The Titi Islands, Tia and the Breaksea group, have had a long history of traditional use, for the seasonal titi (sooty shearwater) harvest by their Maori owners (H A Ashwell, pers comm). Several other areas - Murray's Mistake, Laura's Leg, Pihore Island, Pikaroro, Sinbad's Mistake, Tikotatahi Back Beach opposite the Port Adventure Kaika are all proposed taiapure areas which reflects their traditional use by the tangata whenua primarily as kaimoana sites (Kelly Davis, pers comm).

Archaeological sites are known from Tikotatahi and the Lord's River mouth area. Some are early European surveyors camps, others principally Maori middens (HPT inventory). Maori use of this coastal area was probably related to the seasonal trips to the Titi Islands, also the hair seal harvest in Lords River (Starke 1986). Two skeletons presumed to be seamen who deserted their ship were found at Tikotatahi in 1870.

Water clarity is generally good along the coast. Large beds of brown algae are common including the uncommon *Cystophora congesta*. Dense *Macrocystis* forests are present in places. (pers obs).

This coastline has high landscape values; the clean bright sandy beaches have considerable aesthetic appeal. Much of the landscape value depends on the area's fairly high degree of naturalness and intact forest and scrub cover (pers obs). appeal. Much of the landscape value depends on the area's fairly high degree of naturalness and intact forest and scrub cover (pers obs).

Site Importance: International **National** Regional Local Unknown

Comment:

This area is of national importance for its landscape values, its role as part of the Stewart Island ecosystem as a whole, as a breeding area for seabirds, and its historical cultural values. NZ Forest Service et al, 1978; QEII Trust; Wilson 1987; Grange & McKnight 1987.

Existing Threats:

Type and Comment: cdik

Invasive plants, particularly marram are present on and threaten botanical values of all the beaches (pers obs). Deer and possums along the main island coast have destroyed much of the forest structure and undergrowth and greatly increased the risk of coastal forest dieback which is widespread (Stewart & Burrows pers obs). The entire coastline is fished for crays, cod and paua (pers obs). There is serious concern among both DOC and the industry that the paua population is so decimated it will be unable to restock the area naturally. Resident crayfish are now also uncommon along the coast (pers obs).

Human Modification and Human Use: hid

The main users of this coast are commercial fishermen both day fishermen and those who moor in Port Adventure and Lords River (pers obs). Principal species fished are crays, paua and cod; recreational hunting parties use camp sites along the coast, on both Maori and Crown land. Commonly these parties also dive and fish. There is a minor litter problem at some sites. Charter boats with diving or fishing parties visit occasionally (pers obs). A little used walking track links Paterson Inlet and Port Adventure, crossing Maori land.

Existing Protection:

Type and Comment: adi

1. Bench Island and Whero Rock are Nature Reserves.
2. Scenic Reserves exist at East Cape (57ha), Lords River Islands (3.2ha).
3. The remaining area is predominantly Maori land administered by Rakiura Maori Land Incorporation, fronted by a marginal strip which is subject to a claim under the Treaty of Waitangi.
4. Weka, Pihore, Tia and the Breaksea Islands are Titi Islands administered under the Titi Regulations, Access is restricted to 15 March - 31 May each year for birding and only those with an inherited right plus their spouses can visit the islands. Pihore, Weka, Rukawahakura and Takiwiwini are Crown Titi islands (a) and the remainder Beneficial (i).

Availability of Information:

Natural	1	②	3
Cultural	1	2	③
Historic	1	2	③
Threats	1	2	③
Human Mod. & Use	1	2	③

1 Well documented.
2 Limited information (general).
3 Little information (if any).

Comment:

Little information on the Titi Islands is available because of the limited access to these islands.

Sources of Information:

Natural	1	②	3	4	5	⑥	7
Cultural	①	2	3	4	5	⑥	7
Historic	①	2	3	4	5	6	7
Threats	1	2	3	4	5	⑥	7
Human Mod. & Use	1	2	3	4	5	⑥	7

1 Derived information from existing literature and databases.
2 Derived information as above and field check.
3 Derived from existing maps and aerial photographs.
4 Recent DOC survey including sampling and analysis.
5 Recent DOC survey excluding sampling and analysis.
6 Experience.
7 Expert Opinion.

Comment:

Local DOC staff have surveyed the rocky subtidal coast as far south as Shelter Point as part of an initial reconnaissance survey of east coast Stewart Island. The information is yet to be written up; it is in the form of field notes and dive records (I J Hare).

Alan Grey, boat skipper, DOC, Stewart Island
Harold Ashwell, secretary, Rakiura Maori Land Incorporated, Bluff
Hugh Wilson, Banks Peninsula has supported the map of all rare plant distributions
G Fife - local resident and retired fisherman.

Recorded on Existing Databases: Comment:

Little information exists in any databases.

1	WERI
2	SSWI
③	PNA Scenic and nature reserves
4	Geopreservation
5	HPT County Inventories
⑥	Other - DOC Rakiura database CMID
7	None

Other Considerations:

Almost all this coast has been proposed as a taiapure area by the Rakiura Maori Land Incorporated and has been documented by H Ashwell.

Accompanying Maps and Photographs:

Site Names: Port Adventure

Site No: 140026

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: E49 21440 53380

Date: 13 March 1990

Brief Description of Site:

Port Adventure, on Stewart Island's east coast is an open inlet sheltered by two long peninsulas Starling Head to the north and Shelter Point also Tia Island in the bay's entrance. It covers about 8.4 km² (845 ha). It is typical of the drowned topography which characterises Stewart Island's east coast. Sheltered bays occur at the western end - Abrahams Bosom, Oyster Cove and the mouth of the Hexon River. Whilst the north shoreline is rocky, several sandy beaches are present including the white quartz sands of Salty Beach, and bright orange sands and a low dune at Abrahams Bosom. The coastal vegetation is predominantly forest and scrub with some *Hierochloe*/sedge tussock and open shrubland in the vicinity of the Kaika Beach. The subtidal sediments are principally medium to coarse sand with little epifauna. A long reef runs between East Pt and Tia Island (personal observations).

It is used as a safe boat anchorage by commercial fishermen, and by amateur fishers, divers and hunters (personal observations).

Conservation Values:

Natural: abc

Cultural: abc

Historic: abc

Comment:

A small amount of pingao (vulnerable, Williams & Given 1981) exists on the attractive dune alongside the river at Abraham's Bosom, which is slightly modified by naturalised species (pers obs). Sooty shearwaters breed at Starling Head; (A Gray pers comm); red billed gulls roost on the rocks at East Cape (personal observations). The three small islands around the inner bays serve as something of a refugium for vegetation species threatened by deer in the wider area; the abundance and health of palatable species on them is a valuable feature. The southern limit of mamaku, *Cyathea medullaris* occurs in Oyster Cove (Meurk and Wilson, 1989).

Seven gilled sharks are known to spawn in the Heron River (R Thomas, pers comm).. There are also several interesting features of the marine benthos near Browns Garden, including a large forest of sea tulips *Pyura pachydermatina* (K Walls, pers comm). Rock oysters (*Ostrea sp*) occur in Oyster Cove and in the mouth of the Heron River. The outer area offers superb diving, with lush forests of brown algae, cerianthid anemones and holothurians. Three brachiopod species *Notosaria nigricans*, *Terebratella inconspicua* and *Terebratella sanguinea* live attached to subtidal rocks along with a variety of encrusting hydroids and bryozoans (Grange & McKnight, 1987). The inner bays have considerable aesthetic value - the clean bright sandy beaches, high water clarity and overhanging forest. The inlet's landscape value is related also to its naturalness (pers. obs.). The diving in the outer areas is of superb quality (Submissions from Southern Coasts Package).

"The Kaik" is the site of an old Maori village or kaika (Cave 1980). Nearby was a shortlived settlement of refugees from Enderby Island. The settlers were "Maorioris" from the Chathams Islands originally. (Sansom 1964). The oyster beds in Oyster Cove were commercially fished in 1860 - 7 and virtually decimated. Oysters were translocated in to the Heron River where they still grow (Howard 1974).

The Maori name for the Kaika was Te Wai Paua because the waters were alive with paua - but no longer. Europeans settled and lived at Port Adventure around 1887 - 1899 and several large gardens existed then including Browns Garden (Sansom 1964).

Site Importance: International National Regional Local Unknown

Comment:

High cultural, landscape and marine values make this site of national importance, as is the rest of Stewart Island (QEII Trust, 1978; NZ Forest Service et al 1978; Wilson, 1987; Grange and McKnight, 1987).

Existing Threats:

Type and Comment: acimk

Some areas of the bay are prone to erosion particularly where the forest cover has been damaged either by animals or human impact, historically. Much of the inner inlet has been subject to heavy fishing pressure and crays, finfish and paua are all severely depleted here. The oysters beds in Oyster Cove and Heron River are also threatened by over use. Marram is a threat to all beaches; DOC is trying to retain Abraham's Bosom as a marram-free beach. Small dunes at the Kaika and the adjacent beach are already overrun (all personal observations). Titi have been illegally harvested from Starling Point in the past. (A Gray, pers. comm.).

Human Modification and Human Use: hi

The principal uses of this area are fishing boats which moor in Oyster Cove and Abrahams Bosom and recreational users, principally hunting parties, based at camp or hut sites at the Kaika, Shelter Pt, Kellys, Abrahams Bosom or the Heron River hut. These parties commonly also fish and/or dive. A minor litter problem occurs around some of the camp sites. Oysters are commonly taken from the Heron River. The outer areas are commercially fished occasionally. Charter boats occasionally visit for a days fishing or diving. A little used walking track leads to Paterson Inlet, crossing Maori land (pers obs).

Existing Protection:

Type and Comment: ai

1. Port Adventure Scenic Reserve (503ha) bounds western and northern edges of the bay.
2. Port Adventure Islands Scenic Reserve - 3 small islands only.
3. The Kaika is Maori Reserve 189 (139ha).
4. There is a block of freehold land adjoining Oyster Cove; the remainder is Stewardship land.
5. Marginal strips exist around the freehold and Maori Reserve and are subject to Waitangi Tribunal claim.
6. The district scheme zoning is Rural B.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	②	3	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:

Little exists outside DOC files.

A Gray. Boat skipper, DOC, Stewart Island

R Thomas. Operations Manager, Otago Conservancy. Ex Lands and Survey Ranger, Stewart Island.

K Walls. Coastal & Marine section, DOC Head Office.

Sources of Information:

Natural	1	②	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Alan Gray, boat skipper, DOC, Stewart Island.

A draft CRI report by I J Hare, 1989 exists. Local DOC staff have also undertaken a subtidal survey of the bay, at a reconnaissance level; this exists as field notes and dive records (IJ Hare).

Recorded on Existing Databases: Comment:

- ① WERI North Arm 1979
- 2 SSWI
- ③ PNA - the scenic reserves
- 4 Geopreservation
- ⑤ HPT County Inventories 1986
- 6 Other
- 7 None

Site Names: Lords River

Site No: 140027

Recorders Name: Jane Hare/S King

Conservancy: Southland

Map/Grid Ref: E49 21400 53330

Date: 13 March 1990

Brief Description of Site:

Lords River is a long narrow river mouth on the south east coast of Stewart Island. For about 5km inland from the entrance it comprises a narrow inlet with numerous bays, beaches and small tidal arms with mudflats leading off it. Surrounding the eelgrass flats are saltmarsh turfs, jointed wire rush and flax swamp (pers obs). The total length is 8.5km approximately to where the river narrows.

This river is a major system draining a catchment which extends almost to Paterson Inlet. It's drowned topography is characteristic of Stewart Island's east coast, an old eroded surface tilted gently eastward (Cullen, 1967). At the entrance Lords River Passage, a narrow, shallow and rough passage between John Pt and Owen Island is commonly used by boats. It offers great contrast with the sheltered shores of the inlet, which is used as an anchorage by boats. Podocarp forest and coastal scrub fringes the inlet shores (pers obs).

Conservation Values:

Natural: abcd

Cultural: abc

Historic: bc

Comment:

The fragile intertidal mudflats (which comprise around 20ha) are used as feeding grounds by waders, waterfowl, shags and king fishers; the surrounding bush edges are used for shelter and as breeding areas. (WERI entry). The area has a high degree of naturalness. It is also a nursery area for fish species. The rare fish, giant kokopu (Given and Williams 1981) have been found in the river itself, (Chadderton pers comm) which is also used by waterfowl for feeding and breeding (pers obs). Near the seaward entrance rare yellow-eyed penguins come (Bell 1986) ashore to breed (SJ King pers comm). Fur seals haul out near John Pt and there is a seal colony on Owen Island (Wilson 1981). Little is known of the marine ecology and benthos of the inlet itself (Grange and McKnight 1987).

The small islands support an interesting array of flora including fine populations of at least 8 orchid types (Meurk & Wilson, 1989). The long narrow tidal stretch between low forested hills is unique on Stewart Island from a landscape point of view. Water clarity and quality is high, and the area very scenic. Lords River is reported to be the site of a traditional hair seal annual harvest by Maoris (presumably sea lions) (Starke 1986.)

Maori occupation sites exist around the inlet's entrance. Early European surveyors used similar camp site areas (Cave, 1980.)

Site Importance:

International

National

Regional

Local

Unknown

Comment:

This site is of national importance because it is an integral part of Stewart Island NZ Forest Service and because McKnight 1987: of its use by yellow eyed penguins (S J King pers comm) et al 1978; QEII Trust 1978; Wilson 1982).

Existing Threats:**Type and Comment:** dki

Deer and possums inhabit the margins of the coastal forest and are particularly damaging near the entrance where they increase the risk of coastal dieback. Firing the bush near Lords River to encourage grass growth for deer, has been practised in the past; the risk continues (pers obs).

Human Modification and Human Use: dh

The main use is by fishing boats as mooring areas. It is used by recreational hunters - there are at least three hunters camp sites along the shores of the inlet. Presumably some recreational diving occurs near the camps or in the outer inlets as is usual along this coast. Access is by boat or helicopter (pers obs).

Existing Protection:**Type and Comment:** a

1. Five small islets near the mouth of Lords River form the Lords River Island Scenic Reserve (3.2ha total).
 2. On the southern head is Maori Reserve.
 3. Owen Island is a Crown Titi Island administered under the Titi Regulations.
 4. Large tracts of Maori land border the river, fronted by a marginal strip.
-

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Little information relating specifically to this area.

Sources of Information:

Natural	① 2 3 4 5 ⑥ ⑦	1 Derived information from existing literature and databases.
Cultural	① 2 3 4 5 6 7	2 Derived information as above and field check.
Historic	① 2 3 4 5 6 7	3 Derived from existing maps and aerial photographs.
Threats	1 2 3 4 5 ⑥ 7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1 2 3 4 5 ⑥ 7	5 Recent DOC survey excluding sampling and analysis.
		6 Experience.
		7 Expert Opinion.

Comment: Lyndsay Chadderton, Department of Zoology, University of Canterbury
 SJ King, fisherman, Stewart Island

Recorded on Existing Databases: Comment:

- ① WERI Lords River Estuary 1979
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- ⑤ HPT County Inventories Stewart Island 1986
- 6 Other
- 7 None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Eastern Stewart Island Shelf

Site No: 140028

Recorders Name: Jane Hare

Conservancy: Southland

Map/Grid Ref: 47deg. 15'S 168deg. 00'E

Date: 16 March 1990

Brief Description of Site:

This eastward sloping section of shelf consists of predominately medium to fine terrigenous sand. It extends from South Cape, Stewart Island eastward and northward. It is delineated to the south by the beginning of biogenic sediments of the Snares Shelf. The Foveaux Strait boundary to the north is determined by the fining of sediments and change of slope about 75m depth. The waters crossing the shelf are predominately of subtropical origin, with subantarctic water moving to the south and east; water temperatures tend to be lower than in western Foveaux because of this (King et al, 1985). Offshore rocks include the Traps which lie approximately 22km southeast of Pegasus. There are three distinct reefs here - the South Traps, The North Traps and Boomerang. These reefs barely show above the sea; generally they are awash. Some crayfishing occurs around these reefs (Kingi pers comm).

Other offshore rocks are Black Rock and The Orphan, both of which have been shaped by the continual wash (pers obs).

Conservation Values:

Natural: abcd

Cultural:

Historic:

Comment:

Little is known of the marine conservation values of this area. Fishermen have reported the existence of red coral from the Traps, and of many large crayfish (V Fischer per comm). The area is reported to be a "breeding ground" for crayfish. As such it would be very vulnerable to over fishing. The Traps were named by Captain Cook. Brachiopod species have also been hauled up on craypots in this area (M Schofield pers comm).

Large rafts of sooty shearwater feeding in the northern sector of area are common in autumn. Other seabirds and marine mammals are presumed to feed in this area. Fur seals can often be seen on Orphan Rock (pers obs S King).

Site Importance:

International

National

Regional

Local

Unknown

Comment: Limited detailed information available.

Existing Threats:

Type and Comment: im

The red coral is very vulnerable to damage from craypots dropped and hauled up adjacent to the rocks on which it grows. There is a general threat to the marine environment from the refuse dumped from boats.

Human Modification and Human Use: k

Fishing is the principal activity in this area - craypotting principally. The large swells and strong tides in the vicinity of the Traps limit fishing there to only a few boats (V Fischer, R Hare per comm).

Existing Protection:

Type and Comment:

None

Availability of Information:

Natural	1	2	③	1 Well documented. 2 Limited information (general). 3 Little information (if any).
Cultural	1	2	③	
Historic	1	2	③	
Threats	1	2	③	
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases. 2 Derived information as above and field check. 3 Derived from existing maps and aerial photographs. 4 Recent DOC survey including sampling and analysis. 5 Recent DOC survey excluding sampling and analysis. 6 Experience. 7 Expert Opinion.
Cultural	①	2	3	4	5	6	7	
Historic	①	2	3	4	5	6	7	
Threats	①	2	3	4	5	6	7	
Human Mod. & Use	①	2	3	4	5	6	7	

Comment: V Fisher fisherman, Bluff
R Hare, spouse
M Schofield, retired fisherman, Stewart Island

Recorded on Existing Databases: Comment:

1	WERI
2	SSWI
3	PNA
4	Geopreservation
5	HPT County Inventories
6	Other
⑦	None

Other Considerations:

Accompanying Maps and Photographs:

Site Names: SE Stewart Island Owen Head to Whale Passage Site No: 140029

Recorders Name: Jane Hare/S King

Conservancy: Southland

Map/Grid Ref: E49 D49 21260 53295

Date: 13 March 1990

Brief Description of Site:

A rocky granite coastline of approximately 50 km, with few embayments, this site faces predominantly south-east. It is exposed to storms and large swells commonly sweeping up from the south-west, and east (King et al, 1985). Generally the shore is of steep rock platform; *Durvillea antarctica* bullkelp is exceedingly common. (Some of the offshore rocks such as the Orphan and Black Rock have been worn smooth by wave action). The coastal vegetation is primarily coastal scrub, variants of teteaweka - muttonbird scrub - *Hebe elliptica*; rising to forested hills thence along the Tin Range. Small areas of saltmarsh occur at some creek mouths eg. Maori Creek (Meurk & Wilson 1989). The Southland Current flows northward here across the Eastern Stewart Island shelf (Heath, 1975). Fishing for crays, cod and paua occurs along most of the coast (pers com).

Conservation Values:

Natural: abceg

Cultural: abc

Historic: c

Comment:

This area has a high degree of naturalness, protected from development by the inhospitable climate. The Brothers (formerly the Sisters!), two high rocky domes which dominate the southern coast are of geological interest, being of conglomerate origin unlike the rest of Stewart Island (Fleming and Watters 1974). These islets each have a cover of *Olearia* scrub, and southern skuas occasionally nest on one or other. Yellow-eyed penguins (rare, Bell 1986) have been reported from Big Kuri, Toitoe Bay and the Kopeka River mouth (G Fife, pers comm). The (threatened McDowell 1978) giant Kokopu inhabit the Toitoe River (Chadderton pers com). Sooty shearwaters breed around the entrance to Toitoe Bay, one of the few remaining mainland breeding sites. The (vulnerable 1990) plant punui *Stilbocarpa byallii* has been recorded from the Kopeka River mouth and near Maori Creek and on The Brothers (H Wilson pers com). (A Roberts pers com). Fur seals haul-out at several places along the coast (Wilson G J 1981). Kakapo previously inhabited the hinterland.

The only archaeological site record for this area is for Maori Creek, the site of an early prospectors hut. The tangata whenua have proposed taiapure areas at the Kopeka River mouth, in Toitoe Bay and in Big Kuri Bay, which reflects traditional use of these areas.

This coast is wild and often rough; this is an important element in the landscape. The few sheltered bays such as Toitoe and Big Kuri have considerable aesthetic appeal (pers com).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

As an integral part of Stewart Island with high natural values this area is of national importance (Meurk & Wilson 1989, Wilson 1982, NZFS et al 1978, Q E Trust 1978, Grange and McKnight 1987).

Existing Threats:

Type and Comment: di

Existing Threats:

Type and Comment: di

Deer and possums are present along the coastline and have increased the risk of coastal dieback (NZ Forest Service et al 1978). Cats are also present (pers obs).

This area has been worked by commercial paua divers and probably is threatened by the same depletion of stock that much of the Stewart Island coastline is (pers obs).

Human Modification and Human Use: **Type:** dh

Comment:

Crayfish, cod and paua are fished commercially along the coast. Limited moorings in some bays is possible, but generally few bays are sufficiently enclosed to provide protection from swells (pers obs).

This area is generally inaccessible except by boat. The coast is untracked, and the seas often wild. Occasionally visited by hunters. Access is generally by helicopter or boat (pers obs). Previously a track led from Maori Creek to North Arm, Pegasus; hunters camps are located at Big Kuri and in Toitoi Bay (Rakiura Maori Land Inc Map of hunting sites).

Existing Protection:

Type and Comment: a

1. Pegasus Scenic Reserve (506ha) extends from West of Whale Passage to near the Robertson River.
2. From here stewardship land extends north of the Kopeka River.
3. Land from here to Lords River is Maori land fronted by a marginal strip, subject to Waitangi Tribunal claim.
4. Kopeka Island is a Titi Island administered under the Titi Regulations as a Crown Island. Access is restricted by these regulations (see site 14025). Birded on an incidental basis (A Cox pers com).

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

There is little information available about this stretch of coast.

Sources of Information:

Natural	①	2	3	4	5	⑥	⑦	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Info. from DOC files and Andy Roberts (DOC, Rakiura).
 Kelly Davis MAFfish - taiapure areas. proposal by Rakiura Maori Land Inc, 1990
 Hugh Wilson, Banks Peninsula has supplied a map of rare plant distribution
 Lyndsay Chadderton, Dept of Zoology, Canterbury University
 Andy Cox, Department of Conservation, Invercargill
 Andy Roberts, Department of Conservation, Stewart Island

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - 3 PNA
 - 4 Geopreservation
 - 5 HPT County Inventories
 - 6 Other
 - ⑦ None
-

Other Considerations:**Accompanying Maps and Photographs:**

Site Names: Snares Shelf

Site No: 140030

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: 47 deg. 26'S 167deg. 45'E

Date: 16 March 1990

Brief Description of Site:

This shelf, to the south and south-east of Stewart Island, extends southwards of the Snares Islands but is delineated here by the 12 mile limit; it adjoins eastern and western shelves around Stewart Island to the north.

It is a large area of biogenic sediment sand and gravel.

The Southland Current moves eastward across the shelf and in summer subantarctic waters are often moved north across it by the subtropical convergence. (King et al, 1985).

Conservation Values:

Natural: c

Cultural:

Historic:

Comment:

Little is known of the conservation values of this region communities of *Glycymeris laticostata* - *Venericardia purpurata* are recorded from sand and gravelly sand sediments. (King et al pers comm.)

Seals, whales, sealions and seabirds are presumed to feed in this area. (S King, pers comm.)

Site Importance:

International

National

Regional

Local

Unknown

Comment: Little available information on this area.

Existing Threats:

Type and Comment: i,m

The disposal at sea of marine rubbish such as plastics is a threat to seabird and marine mammal species (pers obs). The depletion of fish and squid, food for marine mammals and seabirds, needs to be considered but no information has been found on this. To the south the Snares is an important breeding island for seabirds. (S King, pers comm).

Human Modification and Human Use:

Type and Comment: k

Part of this area is reported to be fished in late January by Japanese squid boats. (Tortell, 1981) Some crayfishing takes place around The Snares (S King pers comm).

Existing Protection:**Type and Comment:**

None except that this area is part of New Zealand's territorial sea.

Availability of Information:

Natural	1	2	③	1 Well documented. 2 Limited information (general). 3 Little information (if any).
Cultural	1	2	③	
Historic	1	2	③	
Threats	1	2	③	
Human Mod. & Use	1	2	③	

Comment:

A further search for information on the marine values of this area is merited.

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases. 2 Derived information as above and field check. 3 Derived from existing maps and aerial photographs. 4 Recent DOC survey including sampling and analysis. 5 Recent DOC survey excluding sampling and analysis. 6 Experience. 7 Expert Opinion.
Cultural	①	2	3	4	5	6	7	
Historic	①	2	3	4	5	6	7	
Threats	①	2	3	4	5	6	7	
Human Mod. & Use	①	2	3	4	5	6	7	

Comment: S King Department of Conservation, Stewart Island.

Recorded on Existing Databases: Comment:

1	WERI
2	SSWI
3	PNA
4	Geopreservation
5	HPT County Inventories
6	Other
⑦	None

Other Considerations:**Accompanying Maps and Photographs:**

Site Names: Port Pegasus

Site No: 140031

Recorders Name: J Hare / S King

Conservancy: Southland

Map/Grid Ref: D48, D50 20906 53210

Date: 13 March 1990

Brief Description of Site:

Pegasus is a large inlet on the southeastern Stewart Island coast is covering 27km².

Three large islands, Pearl, Noble and Anchorage semi-enclose it from the east, sheltering the inner area from the south westerly swells.

This area is highly scenic - beautiful enclosed waters surrounded by bush-clad hills and islands, with a spectacular backdrop of the unique granite country of southern Stewart Island. The vegetation is primarily sheltered podocarp forest in North Arm and the heads of sheltered coves, with coastal scrub on more exposed faces or areas where seral scrub is regenerating on fire scars which are prevalent in the southern part. Many small eelgrass flats are present including Albion Inlet and Cooks Arm an elongated tidal arm covering some 100 hectares which penetrates 3km into a plateau of pakihia cushionfield (WERI). Few sandy beaches exist; rocky shores and mudflats predominate (pers obs).

In strong westerly conditions, the waters of Pegasus become very choppy. The seaward side of the outer islands is extremely exposed, high cliffs topped by scrub (pers obs).

Pegasus is the second largest inlet on Stewart Island, used as a base for fishing boats and by parties of recreational fishers, hunters and divers (pers obs).

Conservation Values:

Natural: abcdeg

Cultural: abc

Historic: abc

Comment:

Despite the regenerating fire scars, Pegasus is a highly natural area, one of New Zealand's wild, remote waterways. The many exfoliated granite surfaces and domes which surround the southern area are of considerable (national) geological interest as well as being remarkable landscape features. (Geopreservation index) Punui *Stilbocarpa lyalli* (vulnerable, Given, 1990) is found in isolated areas here where deer and possums find it hard to reach (H Wilson, pers comm). The mudflat areas of Cooks Arm, South Arm and Albion Inlet are feeding areas for waders and waterfowl, including white-faced herons, kingfisher, oyster catchers and a population of the threatened NZ dotterel (Bell 1986). They are also the southern most feeding areas for migrant waders - knots, turnstones, and godwits. Most of the coastal area is used by shags, gulls and terns; a white heron has visited parts of South Arm regularly for the past few years. Fiordland crested penguins and yellow-eyed (both rare, Bell 1986) and little blue penguins feed and breed around the shores. Giant petrels have been recorded as breeding at two island locations. The mudflat areas are nursery areas for fish as well (all pers obs).

Stewart Island wekas (regionally threatened Bell 1986) are common on the three outer islands. Fur seals are often seen in the waterways but no haul-out or breeding areas within the inlet are known; Hookers sealions are commonly seen and two haulout areas in the south are known. Dolphins and whales are occasionally seen including southern right and minke whales (all pers obs).

The marine life also has several special features which warrant further investigation. Marine fish are abundant and widespread, at least 32 species recorded. In sheltered areas, algal meadows lying atop soft sediments are common, mostly of *Lenormandia chauvinii* but in shallower areas a mixture of species. Cerianthid anemones and holothurians are commonly present. Meadows of *Ecklonia brevipes* are also common; free-lying forms of algae which usually demonstrate an attached form also occur eg. *Cystophora retroflexa* (all pers obs).

In one location occurs an unusual variant of black coral (endangered IUCN) embedded in such a red algae meadow, again with a free-lying form. Black coral, also occurs in its usual form in some of the outer areas of the inlet (pers obs).

Brachiopods present are *Terebratella sanguinea*, *T inconspicua* and *Notosaria nigricans*; in outer rocky subtidal areas such as Whale Passage, *Liothyrella novaeseelandica* also occurs here. A freely lying form of *Neothyris lenticularis* appears common in on the muddy bottom of North Arm, at around 30 metres depths (pers obs).

In the southern part of the inlet, the shallow rocky subtidal areas are characterised by a wealth of encrusting species - bryozoans, sponges, ascidians and brachiopods, also anemones all overlain with a fine layer of silt.

Pegasus is an area rich in historic and archaeological sites. In North Arm, European occupation centred around gold and tin mining in the Tin Range area, and the fishing station. Water-generated power from a plant on the Belltopper Falls ran the freezer. Occupation continued until the 1950's (Howard, 1974).

Early European sites also exist in the Islet Cove/Cooks Arm, Shipbuilders Cove area, and are possibly associated with the building of one of the first ships in NZ, the Joseph Weller (Howard 1974). Sealing gangs also visited the area (Cave, 1980 ; Stark, 1986).

Maori occupation sites are also extensively present, usually middens and rockshelters. Many of the granite boulders and overhangs around the coast have been used. Human remains and burial sites are also present. A Maori route up Cooks Arm to the west coast has been hypothesized boulders in this area have also been used as shelters (Cave, 1980).

Pegasus has high value as a landscape - the isolation, the wild grand character of the area, the variety of landscapes, the granite domes are spectacular.

Traditional uses of the area include fishing, mining and probably the gathering of kaimoana.

Site Importance:	International	National	Regional	Local	Unknown
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Comment:

The wildlife values, the marine life and the remote, wild grandeur of Pegasus make this site nationally important (Meurk and Wilson 1989). The IUCN lists black coral as endangered, making this an internationally important site. (Grange and McKnight; NZFS et al 1978).

Existing Threats:

Type and Comment: bdik

Deer and possums are common around the coast. Cats have been trapped in the North Arm - kakapo area for several years (pers obs).

The silt of the South Arm area is presumed to be of natural origin.

The freely lying forms of algae and the coral are extremely vulnerable to damage from craypots, dragging anchors or plundering (pers obs).

Scallops are now rare in the inlet, and oysters (*Ostrea* sp.) are not widespread and also threatened by recreational take.

Human Modification and Human Use:

Type and Comment: dhi

There are many bays regularly used by fishermen as mooring sites. Other bays are less frequently used, but any bay offering shelter can be used by fishermen from time to time or by recreational boaties.

After fishing the next most common use is recreation - principally hunting or diving parties.

Past modifications include land clearance for building purposes and fire.

Two old buildings and a concrete jetty still exist in North Arm (pers obs).

Existing Protection:

Type and Comment: a

1. Port Pegasus Islands Scenic Reserve - Noble, Anchorage and Pearl Islands, plus numerous small islets - a total of around 838 ha.
2. South Cape Scenic Reserve) encompass all the coastline except a small area of freehold and, also
Pegasus Scenic Reserve) stewardship land exists in North Arm.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Little documented information about Pegasus specifically.

Sources of Information:

Natural	①② 3 4 ⑤ 6 7	1 Derived information from existing literature and databases.
Cultural	① 2 3 4 5 6 7	2 Derived information as above and field check.
Historic	1 ② 3 4 5 6 7	3 Derived from existing maps and aerial photographs.
Threats	1 2 3 4 5 ⑥ 7	4 Recent DOC survey including sampling and analysis.
		5 Recent DOC survey excluding sampling and analysis.

Comment:

DOC field surveys (including subtidal) conducted in November 1989 and April 1990 and a report is in preparation (J Hare) Hugh Wilson, Banks Peninsula has supplied a mpa of rare plant distribution.

Recorded on Existing Databases: Comment:

CMID

①	WERI	Cooks Arm 1978
2	SSWI	
③	PNA	Scenic Reserves mentioned
④	Geopreservation	The granite knobs are listed in Landforms Inventory
⑤	HPT County Inventories	1986
⑥	Other	DOC Islands database, CMID
7	None	

Other Considerations:

Accompanying Maps and Photographs:

Site Names: South to SW Coast, Stewart Island

Site No: 140032

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: C50 D49 d50 20940 53105

Date: 13 March 1990

Brief Description of Site:

The site extends from the outer edge of Doughboy Bay, around South Cape to north of Ernest (Small craft) Island off Pegasus. The granite coastline is very rugged, with exposed coastal cliffs and few sheltered embayments; of these Easy Harbour in the west and Broad Bay in the east are the largest and most used (pers obs).

The cliffs between South Red Head and Doughboy Bay are exceptionally steep. Whilst the offshore islands offer some protection generally the area is exposed to the prevailing westerly and south westerly also southerly storms (King et al, 1985). Bull kelp *Durvillea antarctica* is common.

Coastal vegetation is primarily teteweka - muttonbird scrub - *Hebe elliptica* variants, with some areas of *Poa astonii* maritime grasslands. A small dune exists at the head of Broad Bay, with beaches in Easy Harbour and Three Legged Woodhen and Flour Cask Bay. The coastline backs a huge area of wilderness - one of the most remarkable parts of New Zealand from a natural history viewpoint (Meurk and Wilson, 1989).

The Southland current travels along the west coast, then eastward around South Cape and up Stewart Island's west coast (King et al, 1985).

Conservation Values:

Natural: abeg

Cultural: abc

Historic: bc

Comment:

The coastline is highly natural; sheer inhospitability protects it. Scenically it is unsurpassed. The remarkable exfoliated granite domes and surfaces form a unique and spectacular backdrop to the south, and south-west coasts. The area offers a range of other land/sea/vegetation scapes as well. There is a small dune in Broad Bay, along with pingao (locally rare, Given 1990) persists despite the presence of marram (pers obs). The hinterland contains the southernmost plant communities of mainland coastal New Zealand with some affinities to subantarctics (Meurk & Wilson 1989).

Ernest and Kaninihi Islands are titi breeding sites (sooty shearwater) and probably also other seabirds. Yellow-eyed penguins (rare, regionally threatened Bell, 1986) and fur seals breed on Ernest Island. Sealions also haul out in Broad Bay and "The Settlement" and breed at the head of Small Craft Inlet. Yellow-eyed penguins nest in Broad Bay and fur seals have been recorded on the rocks between Broad Bay and Flour Cask Bay. Otherwise little information about the area's natural values exists. Fur seals also haul out at several points along the coast (pers obs, S King pers comm).

Offshore, from Whale Passage to south west coast, there have been many sightings of southern right whales and fin whales reported by local fishermen - these may be feeding areas.

Broad Bay was the site of an early European settlement, with a fishing station, freezer and huts (1908 - 1913 at "The Settlement" (Howard, 1974; Cave, 1980). Predating this are Maori occupation sites around Broad Bay (Cave, 1980).

Easy Harbour was the site of an early sealing camp, also of two shipwrecks - the "Industry" in 1931 and the barque "Emilie" in the 1890s (Ingram, 1984). The landing reserve there may relate to traditional use of the area by Maoris en route to the southern Titi Islands. A Maori route from Cooks Arm in Pegasus across to the west coast has also been postulated (Cave, 1980)

Site Importance: International **National** Regional Local Unknown

Comment:

The scenic and wilderness values of this remarkable area are of national importance (Meurk and Wilson, 1989) .

Existing Threats:

Type and Comment: cdj

Threats to this area are from noxious animals - deer, possums also cats. The marram at Broad Bay threatens the biological value of the area. It is interesting to note that among the plastic and fishing rubbish on Broad Bay Beach are also pellets of raw plastic (pers obs).

This area probably does not totally escape the concern about the depletion of paua stocks by commercial divers though it is protected by the extreme exposure (pers obs).

Human Modification and Human Use:

Type and Comment: dj

Tupari Bay, Jackson River, Easy Harbour and Broad Bay are all used as mooring sites for fishing boats (pers comm). Crayfish, paua and cod are fished for commercially in this area.

Ernest Island is a traditional titi island, as is Kaninihi Island. Access is restricted to the muttonbirding season, 15 March - 31 May, by Titi Regulations. Only those with inherited rights, and their spouses may visit the islands (Titi Islands Regs 1978). Otherwise this area is generally inaccessible and has very high wilderness value. Access is by boat or helicopter (pers obs).

Existing Protection:

Type and Comment: di

- 1 Ernest Island and Kaninihi are both administered as Crown Islands under the Titi Regulations (see site 14025).
- 2 South Cape Scenic Reserve (5077 ha) fringes Broad Bay. Pegasus Nature Reserve extends from South of Doughboy Bay to adjoin South Cape Scenic Reserve in the south. Entry is by permit only.
- 3 A small area around Easy Harbour is stewardship land.
- 4 The point here is Landing Reserve adjoining Maori Reserve 195, fronted by a marginal strip.

Availability of Information:

Natural	1	②	3
Cultural	1	2	③
Historic	1	②	3
Threats	1	2	③
Human Mod. & Use	1	2	③

1 Well documented.
2 Limited information (general).
3 Little information (if any).

Comment:

Sources of Information:

Natural	1	②	3	4	5	⑥	⑦
Cultural	1	2	3	4	5	6	7
Historic	1	②	3	4	5	6	7
Threats	1	2	3	4	5	⑥	7
Human Mod. & Use	1	2	3	4	5	⑥	⑦

1 Derived information from existing literature and databases.
2 Derived information as above and field check.
3 Derived from existing maps and aerial photographs.
4 Recent DOC survey including sampling and analysis.
5 Recent DOC survey excluding sampling and analysis.
6 Experience.
7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - ③ PNA South Cape Scenic Reserve
 - 4 Geopreservation
 - ⑤ HPT County Inventories 1986
 - ⑥ Other Dune Inventory, Hugh Wilson 1981
 - 7 None
-

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Southern Titi Islands

Site No: 140033

Recorders Name: S King / J Hare

Conservancy: Southland

Map/Grid Ref: C50 C49 D49 20880 53200

Date: 12 March 1990

Brief Description of Site:

This site encompasses fifteen islands and several smaller islets and rock stacks, off the southwest coast of Stewart Island. Most are Titi Islands, regularly birded for titi (sooty shearwaters or muttonbirds). The largest is Big South Cape at c. 920 ha. (Taukihepa). Poutama, Pohowaitai, Tamaitemoika, Putauhinu Island and Nuggets, Pukeweka, Solomon, Pukuparara, Kaimohu, Big Moggy, Little Moggy, Kundy, Betsy, Big and Rat Island are the other larger islands (pers obs, Titi Islands Regulations 1978).

The vegetation is mainly *Olearia* scrub. All are windswept as the area is exposed to prevailing westerly winds although some protection is afforded to lee shores (King et al, 1985).

Conservation Values:

Natural: abcdh

Cultural: abc

Historic: bcd

Comment:

The greatest value of this group of islands is the rodent-free status of some of the islands. Rodent sensitive species have thus survived - South Island saddleback (endangered) and banded rail (threatened, Bell 1986), both of which are extinct on mainland Stewart Island. The group is also important as a breeding area for mottled petrel (regionally threatened, Bell 1986), diving petrel, storm petrel and sooty shearwater (pers obs). Fur seals use many of the islands as haul-out areas and some as rookeries (Wilson 1981). The last confirmed record of the greater short-tailed bat came in 1965 from Big South Cape and Solomon Islands (Daniel and Baker 1986). Some of the islands also have other rare and threatened bird species - Stewart Island wekas, S.I kaka, St. Is. fernbirds. Rare plants punui *Stilbocarpa hyalii* and cooks scurvy grass are present on most islands, also *Poa astonii filiosa* on some (H Wilson pers comm). The anthribid beetle *Lichenobius littoralis* is found only on Big South Cape (and the Snares) and other interesting coastal insects survive on these islands (Rance 1988).

The islands are probably one of the few areas around Stewart Island where paua stocks have not been seriously depleted as yet. Other marine conservation values may also exist, protected by the islands' remoteness and exposure (pers obs).

As traditionally birded Titi Islands, these all have high cultural values. No archaeological sites are recorded because of the restricted access to the islands. Murderers Cove on Big South Cape is the presumed site of a massacre of sealers in 1823 (Howard, 1984). Probably all the islands were sealed in this era. The islands have important landscape values, as one of New Zealand's wild, remote areas; an important interface of land and sea (NZ Forest Service et al 1978).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The presence of the endangered South Island saddleback and the rodent-free status of some of the islands gives these international importance (Bell, 1986).

Existing Threats:

Type and Comment: di

The potential arrival and irruption of rodents is the biggest threat to the remaining predator free islands and those with only kiore present (pers obs).

The commercial fishing of paua is also a threat, but the weather affords some protection, (pers obs).

Human Modification and Human Use:

Type and Comment: dj

All sheltered areas are used by fishermen as mooring sites (pers obs). All the islands are traditional titi harvesting islands used for centuries.

Modifications to the islands include the erection of huts and construction of tracks. Islands are generally occupied from 15 March to 31 May each year, to which access is restricted by the Titi Regulations. Access is usually by helicopter or boat.

Existing Protection:

Type and Comment: ai

The islands are administered under the Titi Regulations either as Crown or Beneficial Islands. Access is restricted to those with an inherited right or their spouses. The islands are a special muttonbirding zone under the Stewart Island District Scheme. Rat bait stations are maintained around baot moorings at Pegasus in an effort to prevent rats boarding fishing boats bound for the islands.

Putauhina, Pukeweka, Big Betsy, Kundy and Rat Island are Crown Islands (a) and the remaining Titi Islands in the terms of the Titi Regulations are Beneficial (i). (Titi Islands Regulations 1978).

Availability of Information:

Natural	1	②	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Little detailed information is available.

Sources of Information:

Natural	①	2	3	4	5	6	⑦	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	⑦	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	⑦	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Hugh Wilson, Botanist, Banks Peninsula

Recorded on Existing Databases: Comment: DOC's CMID and Island Databases have some information.

- 1 WERI
 - 2 SSWI
 - 3 PNA
 - 4 Geopreservation
 - 5 HPT County Inventories
 - ⑥ Other Island's database, CMID
 - 7 None
-

Site Names: Doughboy Bay

Site No: 140034

Recorders Name: J Hare/S King

Conservancy: Southland

Map/Grid Ref: D49 20080 52390

Date: 13 March 1990

Brief Description of Site:

Doughboy Bay on Stewart Island's west coast is an indented bay exposed to westerly surf. The beach of granitic sand is an unbroken sweep, 2.5 km long. At the south end is an extensive dune system cut by a sizeable stream, Doughboy Creek, which drains a catchment extending up onto the Tin Range. The dunes are heavily modified by marram grass (pers obs).

The hinterland is of steep hills with rimu-kamahi forest. The coast is cliffed to the north and south. A dune slack area exists to the south of Doughboy Creek. Access is generally by tramping track from Masons or Rakeahua or via helicopter or small plane. Boat landings are difficult. Quicksand exists at the mouth of Doughboy Creek (pers obs).

Conservation Values:

Natural: abcdh

Cultural: bc

Historic: c

Comment:

A few areas of pingao, a rare (Given 1990) native dune sedge, are still present on the edges of the main dune system. Unfortunately much of the diversity of dune species has been lost as marram has completely overrun the dunes in the last 10 years (pers obs, Wilson H, 1981).

A colony of one of the world's rarest native plants in the wild the endangered (Given 1990) *Gunnera hamiltonii* grows on a old dune ridge behind the beach, among grassy vegetation (pers obs).

Yellow-eyed penguins have been recorded from the northern edge of the beach (DOC files, Stewart Island). The threatened bird species NZ dotterels and banded dotterels both feed on the beach area as do the rare variable oyster catchers (pers obs; Bell 1986). Stewart Island kiwis are common in the surrounding bush and sometimes use the dunes and beach for feeding (pers obs).

Doughboy was used by sealing gangs in the early 1800's as a base; possibly they utilised the cave now used by trampers (Howard 1974). No Maori archaeological sites or use are known (HPT County Inventory, 1986).

The wild scenic nature of Doughboy, the spectacular big sand slopes especially into Doughboy Creek, the high surrounding hills and wide beach all give this area considerable aesthetic and landscape value. The sea has eroded the rock faces at the south end of the beach into attractive arches and coves. The difficulty of access and remoteness adds to its attractions (pers obs, Wilson HD 1981).

Unfortunately the marram has destroyed much of the dunes biological values, but this example can be used as evidence to strengthen the need to save the other west coast dunes on Stewart Island from such modification (pers obs).

Site Importance: International National Regional Local Unknown

Comment:

The *Gunnera hamiltonii* site is of at international importance; the bay is of national importance as part of the Stewart Island ecosystem (NZFS et al, 1978; Wilson, 1987; Given 1990.)

Existing Threats:

Type and Comment: cdk

Marram dominates almost all the dunes, although some pingao remains. Gorse is present along the low dunes to the south of the creek and is being managed. Deer have also considerably modified the dune and forest. A rubbish problem exists around the cave used as a tramping shelter (pers obs).

Human Modification and Human Use: dh

The bay is used by fishing boats for mooring occasionally. Shore based recreation includes tramping and hunting. A natural cave has been modified to accommodate trampers/hunters, with three bunks added and a small bivi recently built by DOC 1990. Doughboy is on a circular route which includes Masons Bay and Rakeahua. Hunting parties are commonly flown into the area (pers obs).

Existing Protection:

Type and Comment: a

All the area surrounding Doughboy Bay is stewardship land under the control of DOC.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Little detailed information specific to this site is available.

Sources of Information:

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - 3 PNA
 - 4 Geopreservation
 - ⑤ HPT County Inventories 1986
 - ⑥ Other Hugh Wilsons draft inventory of Stewart Island dunes 1981.
 - 7 None
-

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Mason Bay

Site No: 140035

Recorders Name: S King / J Hare

Conservancy: Southland

Map/Grid Ref: D48 D49 21110 53522

Date: 12 March 1990

Brief Description of Site:

A very long, broad sweeping beach, Mason Bay is located on Stewart Island's west coast. The broad, granitic sands are backed by extensive sand-dunes, widest in extent in the central Mason Plain plain area. Here the active dunes extend 3km in land to an area of alluvial flats of red tussock and swamp crossed by parallel ridges of ancient dunes. The beach is 14km long, the southern third sheltered by the prominent curve of the windswept Ernest Islands. Otherwise it is exposed to the prevailing westerly storms from the Tasman Sea. The dunes, backed by forested hills to the north and south, contain innumerable dune slacks and hollows, tongues of forest and scrub, rock outcrops and several streams traversing the sand from the forested catchments of the interior.

Large "sandpasses" where moving sand crosses high ground through gaps in the hills between the bay and plain, are spectacular features (Wilson, HD 1981).

Conservation Values:

Natural: abcdegh

Cultural: abc

Historic: abcd

Comment:

Despite the dense covering of marram along the foredunes, the sheer size of the dune area has allowed large areas to remain unmodified. Nearly every Stewart Island dune species is present including vulnerable *Euphorbia glauca* and the endangered *Gunnera hamiltonii*. (Given 1990) Several other uncommon dune plants are also present - *Luzula celata* and *Scleranthus uniflorus* included. Pingao (locally rare, Given 1990) is widespread, dominating the greater part of the dunes, despite the marram (Patrick et al 1989). The dunes are commonly used by Stewart Island kiwis feeding and breeding and other rare/threatened (Bell 1986) birds such as banded dotterel (breeding/feeding/flocking) and NZ dotterel - flocking and feeding and variable oystercatchers (pers obs). Skinks are often seen on the dunes, and pipits, shags, terns and variable oystercatchers (probably breeding) all use the beach for feeding or resting (pers obs). The dunes also have an interesting entomological fauna including endemic moth species. Giant kokopu (threatened, McDowell 1978) have been found in Duck Creek (L Chadderton pers comm) and possibly inhabit other creeks here as well.

The dunes are also of geological interest. Ancient shellbeds of tuatua and peat outcrops are exposed in the vicinity of Cavalier Creek. The central dunes contain extensive fields of small angular pebbles, the origin of which is uncertain (Bishop). The tombolo between Inner Ernest Island and the southern end of Mason Bay beach is of national geological interest as a landform (Geopreservation Index) as are all the dunes including the large sandpasses north of Duck Creek.

The unusual shape of Mason Bay, located on another otherwise rocky, irregular coast has been attributed to a meteor impact, with the centre located at the reef off the centre of the bay, but this theory has been largely disproved. Ventifacts are present on the dunes (pers comm).

Mason Bay is the site of two historic pastoral runs; Kilbride at the southern end and Island Hill. Both homesteads are still standing but only a small area of land at Kilbride is still grazed (pers obs). Kilbride was also the site of an early shore whaling station (Howard, 1974). The southern area is also rich in Maori archaeological sites (HPT County Inventory, and pers obs) including burials. Boulton records Maori occupation of this area (Starke 1986).

Moa skeletons have also been uncovered in the dune area. A Maori midden also exists at the northern end of the beach (pers obs). Shipwrecks have been washed up in Cavalier and Wreck Creeks (pers obs).

Little is known of the conservation values of the subtidal area of Masons Bay. Tuatua are present (pers obs). Electrocorp are measuring the wave energy to evaluate the area as a potential site for wave generated power (E Brown pers comm).

Mason Bay is an outstanding area, with large-scale dramatic sand landscapes, a diversity of habitats and richness of dune flora and insect fauna (Wilson, HD 1981, Patrick et al 1989).

Site Importance: International National Regional Local Unknown

Comment:

The biological, landscape and geological features of this area are of national importance. However the presence of the endangered *Gunnera hamiltonii* gives this site international importance (NZFS et al 1978, Wilson HD 1981, Given 1990).

Existing Threats:

Type and Comment: acdkm

Marram and lupin seriously affect the biological values of the dunes, although the lupin has been severely hit by the fungus, *Phytophthora*, and may now be controllable. Deer, possums and wild cats inhabit the dunes and surrounding forest which has been weakened in structure. In places the dunes are actively invading the forest. Another prime threat particularly to the adjacent tussocklands is fire. An enormous accumulation of plastic and other rubbish is washed ashore, both from domestic and foreign boats; this threatens wildlife and detracts from the wild scenic values of the area. A few wild sheep still occur around parts of the dunes (all pers obs).

Human Modification and Human Use: ahk

The Kilbride and Masons grasslands have been modified by grazing coastal animals. To the north of Inner Ernest Island is the only area used by fishing boats for shelter. The prime use of the area is recreational. A trampers hut at Duck Creek and two hunters shelters are situated in or near the dunes to accommodate the large numbers of hunters and trampers. Light planes use the beach at low tide as a landing strip. Masons is located on the north-west circuit tramping route; additionally a track leaves near the south end of the beach to Doughboy Bay and thence Rakeahua.

The Island Hill homestead is also used by DOC as a base for scientific and maintenance work and monitoring eg. of the kiwi population in the grasslands.

(All based on personal observations.)

Existing Protection:

Type and Comment: a

Island Hill is formerly run 570, and Kilbride run 571 (Howard 1974). All are now stewardship land under DOC's control. A small grazing licence to J Duston exists at Kilbride and is due for renewal.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	1	②	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	⑥	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

The Portobello Marine Laboratory boat the Munida will be conducting offshore surveys in the Masons area later in 1990, for sediments and cadmium levels (K Prob ert pers. comm).

Lyndsay Chadderton, Department of Zoology, Canterbury University.

E Brown Electricorp.

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- ④ Geopreservation - Landforms
- ⑤ HPT County Inventories 1986
- ⑥ Other - Hugh Wilsons draft dune inventory 1981
- 7 None

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Western Stewart Island Shelf

Site No: 140036

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: 46deg. 55's 167deg. 26'se

Date: 16 March 1990

Brief Description of Site:

This marine site extends from the western boundary of Foveaux Strait, off the Rugged Islands in the north, southward to South Cape where it skirts the Eastern Stewart Island shelf. To the south is the Snares shelf and to the west the shelf plunges steeply into the trough south of the Solander Islands - the north western extremity of the Campbell Plateau.

This district is exposed to prevailing westerly winds, and splits the Southland Current, part of which moves south across the shelf and around South Cape (King et al, 1985).

Conservation Values:

Natural: c

Cultural:

Historic:

Comment:

Little is known of the marine values of this area. Seals, penguins and sea birds are presumed to feed at sea in this area.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

Existing Threats:

Type and Comment: im

The disposal of rubbish at sea, which is washed in by the westerlies, is a threat to marine mammals and seabirds using this area. The extent of this debris can be seen from that washed up on Stewart Island's western beaches (pers obs). The effect of depletion of fish stocks on the feeding of seabirds and marine mammals also needs to be considered.

Human Modification and Human Use: k

The principle activity in this area is trawl fishing. Some Joint Venture trawling in late January is reported to occur in the western area of this site (Tortell 1981). Squid fishing boats probably also operate here as their lights can be seen offshore occasionally (pers obs).

Existing Protection:**Type and Comment:**

None except that this area is part of New Zealand's territorial sea.

Availability of Information:

Natural	1	2	③	1 Well documented. 2 Limited information (general). 3 Little information (if any).
Cultural	1	2	③	
Historic	1	2	③	
Threats	1	2	③	
Human Mod. & Use	1	2	③	

Comment:

A literature search for further information on this area is merited.

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases. 2 Derived information as above and field check. 3 Derived from existing maps and aerial photographs. 4 Recent DOC survey including sampling and analysis. 5 Recent DOC survey excluding sampling and analysis. 6 Experience. 7 Expert Opinion.
Cultural	①	2	3	4	5	6	7	
Historic	①	2	3	4	5	6	7	
Threats	①	2	3	4	5	6	7	
Human Mod. & Use	①	2	3	4	5	6	7	
	①	2	3	4	5	6	7	

Comment:**Recorded on Existing Databases: Comment:**

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- ⑦ None

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: Western Stewart Island Coast

Site No: 140037

Recorders Name: J Hare/S King

Conservancy: Southland

Map/Grid Ref: 048 21080 53623

Date: March 1990

Brief Description of Site:

This site extends from the west of Cave Point in the north to north of South Red Head (excluding Mason Bay and Doughboy) which are separate sites. It extends seaward to the change in slope at the edge of the shelf at a depth of approximately 60m. The coastline consists of repeating sequences of hard and soft shores (the major soft shores of East and West Ruggedy, Mason and Doughboy are separately described). The rocky coastline is largely of truncated headlands with numerous offshore rocks and islets north of Mason Head, also the Ernest Islands at the south end of Mason Bay. The area is exposed to the force of the prevailing westerlies, and has a wild, remote aspect. Part of the Southland current, which is split at western entrance to Foveaux Strait, travels southward around South Cape (King et al, 1985).

The aptly named Hellfire coast has numerous small bays and truncated headlands extending to many rocky islets on a windswept coast, with the Ruggedys as a dramatic backdrop. At the south end of the wide sweep of Mason Bay the Ernest Islands are highly visible; the inner island connected to the mainland by a tombolo (Geopreservation Index). South of here the coast of tall resistant cliffs is wild rough and rugged, with plants clinging to the rock (pers obs).

Conservation Values:

Natural: abcde

Cultural: abc

Historic: b

Comment:

This coastline retains a high degree of naturalness, being little used or modified by man. In the North the Ruggedy's rise steeply from the coast, steep irregular and jagged; this area is of geological interest and is thought to be of volcanic origin (Alibone 1986). The dune system at Little Hellfire is well covered with pingao, a locally rare plant (Given 1990). The coastal vegetation in the south is windswept coastal scrub with some interesting plants perched on the cliffs eg *Celmisia rigida* (pers obs).

Little is documented about seabird roosts and nesting areas. Fur seals haulout occasionally along the coast (Wilson, G J 1981). Stewart Island shags nest on a stack off Waituna and probably elsewhere. The coastline is an important breeding and feeding area for seabirds. Banded dotterel (threatened, Bell 1986) feed on Little Hellfire beach (pers obs).

This coastline has tremendous aesthetic and landscape value (pers obs; NZFS et al 1978).

Little is known of the historic value of this area. Middens from Maori occupation are present at Waituna, Little Hellfire and small beaches between (pers obs). This site has high conservation value.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

This area is an integral part of the Stewart Island area ecosystem; its landscape values, the wildness and degree of naturalness combine to make this site of national importance (NZFS et al, 1978; Wilson, 1987).

Existing Threats:**Type and Comment:** dim

Commercial fishing for crayfish and paua diving occur along the coast. The southern area is one of the last remaining areas of Stewart Island's coastline to be dived extensively for paua and it's roughness and distance has limited the extent of fishing. Coastal dieback of the forest occurs along much of this exposed coastline (pers obs).

Deer and opossums are widespread (pers obs).

Human Modification and Human Use: hd

A tramping track, part of the N-W circuit follows the coast south to Mason Bay. Recreational hunters use bivis and campsites at Little Hellfire Waituna, East and West Ruggedy. A secondary track heads inland from Kilbride at the south of Masons to Doughboy. South of here the area is wild untracked and seldom visited (pers obs).

Existing Protection:**Type and Comment:** ai

Outer Ernest Island is Maori Reserve with a marginal strip fronting it. The remaining land is stewardship to the south of Doughboy where the extensive Pegasus Nature Reserve begins. Entry to the Reserve is by permit only.

Availability of Information:

Natural	1	2	③	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment: Little detailed information available.

Sources of Information:

Natural	①	2	3	4	5	⑥	⑦	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	⑥	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	⑥	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- ③ PNA Pegasus Nature Reserve
- 4 Geopreservation
- ⑤ HPT County Inventories 1986
- ⑥ Other Hugh Wilsons dune inventory 1981.
- 7 None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Big Hellfire Beaches and Sandpass

Site No: 140038

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: D48 20075 53640

Date: 10 March 1990

Brief Description of Site:

This site extends approximately 1km along the coast and 1km inland.

Big Hellfire Sandpass, a dramatic landscape feature, is a narrow tongue of sand dune which climbs steeply from the sea to hill top at 250m then descends part way down the backslope towards the Upper Freshwater Flats. The Sandpass is largely covered with pingao (locally rare, Given 1990) and has a stonefield near the top. The backslope has a red tussock / shrub cover (pers obs).

At the foot of the sandpass and to the south is a small beach, 600m long. The adjacent vegetation cover, other than small back dunes is coastal podocarp forest. Other small beaches and tongues of sand exist to the north and south. Offshore the coastline is rocky, wild and rough, with many small islets and exposed rocks hence its name "Hellfire" (pers obs).

Conservation Values:

Natural: abde

Cultural: bc

Historic:

Comment:

This area is relatively inaccessible except by foot; boat landings are not possible. The landscape is dramatic; the steep sandpass dominates the vista both from the track at the top, and from the sea. Like almost all of Stewart Island, this area has an exceptionally high degree of naturalness (pers obs).

Seabirds roost and probably nest on some of the offshore islets but have not been studied. Variable oyster catchers (rare Bell 1986) are present on the beach (pers obs; Wilson HO 1981).

Hugh Wilson rates the dune as an area of national biological importance because of its spectacular scenery, wealth of native dune species and virtual lack of contamination and its attractive hinterland (unpublished dune inventory 1981). Pingao, which is a locally rare plant, (Given 1990) is abundant and occurs to over 200m above sea level. The structure of the dune / sandpass is geologically interesting and merits further investigation. This is a fragile area.

Other interesting dune plants here include *Gingidea flabellata* a Stewart Island endemic, and *Acaena microphylla* var *pauciglochidiata* (both totally common, Wilson 1982) (pers obs).

No known shipwrecks, archaeological sites, or traditional uses. This site has high conservation values.

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The biological values of the sandpass are of national importance (Hugh Wilson); so too is the landscape value (Wilson, unpublished dune inventory 1981).

Existing Threats:**Type and Comment:** cdim

The principle threat to the dune is the small area of marram grass on the foredune of the adjacent beach. This probably arrived by sea, and threatens the biological values of the whole dune system as it could easily displace the pingao and the insects dependent on it. Marine plastic debris has accumulated at the top of the beach and in the foredunes. Animals - deer, possums are weakening the adjacent forest cover. Coastal dieback off the forest is present along this coast (pers obs).

This area has also been dived extensively for paua and removal of this species threatens to modify the subtidal communities (pers obs).

Human Modification and Human Use: hk

Rough hunters camps are sited in the low backdunes behind the small beach south of the sandpass. Discarded rubbish is a problem around these sites. Three tramping tracks, part of the north-west circuit meet at the top of the sandpass, where there is a further camp site.

Fishing, paua diving, tramping and hunting are the principal uses of this area, but generally land usage is not high.

All based on personal observations.

Existing Protection:**Type and Comment:** a

This area is all stewardship land under DOC's control.

Availability of Information:

Natural	1	②	3	
Cultural	1	②	3	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	⑥	7
Cultural	①	2	3	4	5	⑥	7
Historic	①	2	3	4	5	6	7
Threats	1	2	3	4	5	⑥	⑦
Human Mod. & Use	1	2	3	4	5	⑥	7

- 1 Derived information from existing literature and databases.
- 2 Derived information as above and field check.
- 3 Derived from existing maps and aerial photographs.
- 4 Recent DOC survey including sampling and analysis.
- 5 Recent DOC survey excluding sampling and analysis.
- 6 Experience.
- 7 Expert Opinion.

Comment:

The area was visited by DOC Staff J Hare, B Rance (Invercargill) and J Roberts (Stewart Island) during a botanical dune survey, 1989.

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- 5 HPT County Inventories
- ⑥ Other - Dune Inventory 1981 A site record is included in Hugh Wilson's unpublished
- 7 None Stewart Island dune inventory

Other Considerations:

Accompanying Maps and Photographs:

Site Names: Codfish Island

Site No: 140039

Recorders Name: S King / J Hare

Conservancy: Southland

Map/Grid Ref: D48 50000 53680

Date: 6 March 1990

Brief Description of Site:

Codfish is an island of 1396ha lying 4km off the north west coast of Stewart Island. It contains a wide range of habitat, from steep rocky cliffs with thick coastal scrub in the west and south, to open pakihi areas on the top and tall podocarp in sheltered catchments to the north and east.

The island is roughly circular, highest point 250m ASL and the coastline mainly rocky, platform or large broken rock, sometimes smooth round boulders eg. NW Bay, Rogers Head beach. Only one sandy beach is present, Sealers Bay; it faces NE and is about 1km long. A small dune system extends behind the beach for ca. 150m (all pers obs).

The island is Nature Reserve, managed for its wildlife values and as a refuge for the kakapo (endangered, Bell 1986). Possums and Stewart Island wekas were formerly present but were removed by extensive operations of the Wildlife Service in 1980s (pers obs).

The only human use of this area is by the Department of Conservation, occasional guided visits, and boats fishing around the coast.

Conservation Values:

Natural: abcdgh

Cultural: ac

Historic: abcd

Comment:

Codfish supports a number of rare or endangered species including pingao (locally rare, Given 1990) on the Sealers Bay dunes, *Stilbocarpa lyallii*, (vulnerable, Given 1990) short-tailed bat (threatened, Bell 1986), yellow eyed penguin, Cooks petrel, (both regionally threatened, Bell 1986) South Georgian diving petrel, kakapo (both endangered) (transferred from Stewart Island) Codfish Is. fernbird (threatened, Bell 1986), South Island kaka and green backed skinks. It is possible that giant kokopu (threatened McDowall 1978) are present in the freshwater catchments (L Chadderton pers comm). There is a good representation of forest birds eg. rifleman, parakeets, brown creepers etc. Furseals are common around the rocky coasts and beaches to the west and south. Hookers sealions have sometimes used the beaches as haulouts eg. NW Bay, Sealers Bay (pers obs).

Generally the island's value lies in the fact that the habitat is in good condition and a variety of species are found there. Because of its high degree of naturalness and the absence of predators, other fauna values would be high. This site has very high conservation values (pers obs).

The yellow-eyed penguin, furseal, bat and kakapo populations are monitored by DOC, as well as monitoring of vegetation phenology as part of the kakapo programme (pers obs).

Codfish is the site of an early sealers base. It was settled by sealers and their Maori wives; it was also visited by Maori en route to the titi islands as there is evidence of totara bark being taken for titi storage bags. Burial and midden sites are known; also a human skeleton found on the western cliffs. Two boats have been wrecked in the Sealers Bay area (Ingram 1984). The Maori name for the island is Whenuahou. More recent history relates to the brief use of the island as a pastoral run in the early 1900s (Howard, 1974; H Ashwell pers comm; pers obs).

The island is an important element in most views of the west coast of Stewart Island, including from Western Southland.

Site Importance: International National Regional Local Unknown

Comment:

Codfish Island is of international importance as a refuge for the kakapo, which are endangered. Otherwise nationally important as a refuge for wildlife and its predator free, (except kiore) status (Bell 1986; Meurk and Wilson 1989).

Existing Threats:

Type and Comment: cdik

The Sealers Bay dunes are threatened by marram grass, which has been present for several years; control operations are underway. The only introduced mammal present is the kiore rat (*Rattus exulans*). The risk of invasion by other rats or manamalian predators is a serious threat to the fauna and flora (pers obs).

Crayfish and paua are taken commercially from around the shores. Requests for visitors to go to the island (naturalist groups etc) may increase. Visitor presence could threaten some aspects of the islands ecology (pers obs).

Human Modification and Human Use: dk

Bays on the sheltered eastern side of the island are used as mooring sites by fishermen eg. Sealers and Roderiques Bay.

The island is currently manned by DOC staff with one base hut at Sealers Bay and a track system set up for field operation; landing is by boat in Sealers Bay or by helicopter.

Existing Protection:

Type and Comment: a

Codfish Island is a Nature Reserve, entry by permit only. Scientific work is restricted to that directly applicable to the island's management.

Availability of Information:

Natural	①	2	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	②	3	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Much of the information is available in report form from various DOC sources.

Sources of Information:

Natural 1 ② 3 4 5 ⑥ 7
 Cultural ① 2 3 4 5 6 7
 Historic ① 2 3 4 5 6 7
 Threats 1 2 3 4 5 ⑥ 7
 Human Mod. & Use 1 2 3 4 5 ⑥ 7

- 1 Derived information from existing literature and databases.
 2 Derived information as above and field check.
 3 Derived from existing maps and aerial photographs.
 4 Recent DOC survey including sampling and analysis.
 5 Recent DOC survey excluding sampling and analysis.
 6 Experience.
 7 Expert Opinion.

Comment:

Lyndsay Chadderton, Dept of Zoology, University of Canterbury.
 Harold Ashwell; Secretary Rakiura Maori Land Incorporated, Bluff.

Recorded on Existing Databases: Comment:

1	WERI	
2	SSWI	
③	PNA	
4	Geopreservation	
⑤	HPT County Inventories	1986
⑥	Other	Hugh Wilson's draft inventory of Stewart Island dunes 1981
7	None	DOC's CMID and islands database

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: East and West Ruggedy

Site No: 140040

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: D48 21070 53755

Date: March 1990

Brief Description of Site:

The site includes the East and West Ruggedy dune systems, the coast between and the Rugged Islands offshore altogether about five km of coastline. East Ruggedy beach is 1km long; the flattish dune system extends well inland, with numerous hummocks, dune slacks, a stonefield, and along the northern edge, a major creek.

The West Ruggedy dunes consist of at least five discrete, steep systems all fronting the long, broad 2km beach. The major system at the northern end has large dramatic rock outcrops and stonefields, and a swamp valley along a creek. The other systems are steep tongues of dunes, ascending valleys between the coastal podocarp forest. North Red Head, the northern end of the Ruggedy Mountains, descends to a coastal turf community at the southern end of the beach. The adjacent coast including the dramatic Rugged Islands is wild and inhospitable (all pers obs).

This area is visited only by trampers, hunters, and boats fishing offshore.

Conservation Values:

Natural: abcdegh

Cultural: abc

Historic: bc

Comment:

All this coast including the dune systems have an extremely high degree of naturalness, with little invasive plants (pers obs). Pingao (a rare plant Given, 1990) is very common. At West Ruggedy a colony of *Gunnera hamiltonii* one of the world's rarest plants in the wild was recently discovered; this plant is endangered (Given 1990). A small patch of the uncommon *Raoulia* sp. aff. *hookeri* occurs on the stonefield at East Ruggedy. Other interesting dune species present include *Gingidea flabellata* a Stewart Island endemic (pers obs).

East Ruggedy has a wide diversity of sand habitats, a rich flora and an attractive setting. Hugh Wilson ranks it as of very high botanical value (dune inventory 1981, unpublished).

The insect fauna of the dunes has not been studied and merits investigation because of the area's naturalness. Banded dotterel, which are a threatened species (Bell 1986) have been seen feeding and breeding at West Ruggedy; variable oyster catchers, (rare Bell 1986) and Fiordland crested penguins (rare Bell 1986) are also present (Buckingham 1980). Fur seals commonly haulout on the Rugged Islands.

These dunes a fragile ecosystem. The Ruggedys are of geological interest because of possible volcanic origin (Allibone 1986). The land / seascapes of this area are wild and grand, dramatic and very natural. The high, jagged Rugged Islands, imposing heights of Red Head Peak, the steep West Ruggedy sand dunes, sweeping inland, dominate the landscape (pers obs). Both West and East Ruggedy are valuable archaeological areas; a workshop for argillite and related occupation site are known from the area (HPT County Inventory). East Ruggedy was possibly the site of a battle or dispute; the area is called Putarara (DOSLI Holidaymaker Map of Stewart Island); supporting evidence for this was recently found (J Roberts pers comm).

North Red Head is known to be a goldmining site (Howard, 1974). The fishing vessel Ngai Tahu was wrecked at East Ruggedy (Ingram, 1984).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

The *Gunnera hamiltonii* is of international importance, as it is endangered; the remaining area of national significance for its biological and landscape values, (Wilson's dune inventory; NZ Forest Service 1978; QEII Trust 1978; Wilson 1987) as is all of Stewart Island.

Existing Threats:

Type and Comment: cd km i

Invasive plants, are a major threat. Marram is present at East Ruggedy and the northern end of West Ruggedy in small areas. It is still at an eradicable stage (G Millar pers comm). One old gorse bush occurs beside the stream at East Ruggedy and should also be removed. Deer and possums have weakened the forest structure along the coast. At the back of the beach and in the foredunes plastic rubbish from the sea has accumulated particularly on West Ruggedy. There is also a rubbish problem around hunters' camps at West Ruggedy. The coast has been fished for cod, paua and crayfish; the principal threat to the rocky subtidal communities is due to a serious depletion of paua and the follow-on effects of this. These are all based on personal observations.

Human Modification and Human Use: h

The main Stewart Island tramping route, the N-W circuit, passes across the Ruggedy dunes. A small bivvy is situated in a hollow in the back dunes, with a hunters camp nearby. A hut on Maori land at the northern edge of the beach was recently burnt (personal observations).

At West Ruggedy a cave is used as a hunters camp occasionally, the other camp site is at the top of the dunes. It is possible to land on East Ruggedy beach in fine weather and boats regularly fish the coast, but generally usage of the area is low (personal observations).

Existing Protection:

Type and Comment: a

Maori Reserve 194 runs down the northern side of the dunes; otherwise the surrounding area is all stewardship land under DOC's control. A marginal strip exists along the coast and side of the creek, for the MR 194.

Availability of Information:

Natural	1	②	3	
Cultural	1	②	3	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Detailed information is generally restricted to dunes and dune vegetation. Some studies on the geological values of the Ruggedy Mountains area are available but not seen.

Sources of Information:

Natural	1	2	3	4	5	6	7
Cultural	1	2	3	4	5	6	7
Historic	1	2	3	4	5	6	7
Threats	1	2	3	4	5	6	7
Human Mod. & Use	1	2	3	4	5	6	7

- 1 Derived information from existing literature and databases.
- 2 Derived information as above and field check.
- 3 Derived from existing maps and aerial photographs.
- 4 Recent DOC survey including sampling and analysis.
- 5 Recent DOC survey excluding sampling and analysis.
- 6 Experience.
- 7 Expert Opinion.

Comment:

This area was visited by DOC Staff J Hare, B Rance and J Roberts during a botanical dune survey, 1989.

James Roberts, field worker, Department of Conservation, Stewart Island
Graeme Miller, Weed Control, Department of Conservation, Invercargill

Recorded on Existing Databases: Comment:

- | | | |
|---|------------------------|---|
| 1 | WERI | |
| 2 | SSWI | |
| 3 | PNA | |
| 4 | Geopreservation | |
| 5 | HPT County Inventories | - 1986 |
| 6 | Other | Islands Database (Rugged Islands)
Hugh Wilson's dune inventory, unpublished DOC records 1981 |
| 7 | None | |
-

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Pahia - Old Man Rock

Site No: 140041

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: d46 21040 54175

Date: 15 March 1990

Brief Description of Site:

The rocky coastline from Pahia to Wakaputa Point is fringed by several reefs and rocky stacks. It is well known as a rough, exposed coastline, subject to heavy swells and surges. Two small bays with broken rock shores are located between the Pahia and Old Man Rock headlands. Both Garden Bay and Cosy Nook (or Mullet Bay) have road access and slipways are well used. The headlands have steep rocky slopes, below rough pasture that is grazed down to the shore. Pahia Hill a prominent hill overlooking Te WaeWae Bay is forested with exposed coastal forest, about 200ha in extent.

The land area behind this coast is all farmed.

Conservation Values:

Natural: acfg

Cultural: abcde

Historic: b

Comment:

The land adjacent to this coastline is pasture, well modified; the only area retaining high naturalness is Pahia forest (154ha of hill forest). This forest is representative, and a good example of coastal podocarp - kamahi forest, a type that was once much more widespread in Southland (Allen et al 1989).

Seals are known to haulout along this coast at various points including Old Man Rock (T Tidey and B Bennett pers comm).

The islets off Cosy Nook are roosting and breeding sites for seabirds - red-billed gulls, little and spotted shags, little blue penguins and white-fronted terns. Sooty shearwaters are reported as nesting on the largest island. (SUC 1983; submissions to SUC plan from I A R Mathieson).

Interesting rock formations occur along this coastline. The area is regularly visited by Otago University Geology students (Daphne Lee pers. comm.). A large rock at Old Man Point has the Maori name Ruahine (woman) (Starke 1989.)

A site in the vicinity of Cosy Nook is one of the shore study sites monitored by Dr Bill Ballantine (P McLelland pers comm).

The area has traditionally been occupied by Maoris. A kaika at Pahia was called O-wi-toti (Starke 1986). The shore between Pahia Point and Old Man Rock has been proposed as a taiapure area, reflecting the traditional gathering of kaimoana here (K Davis pers comm).

Maori archaeological sites exist in this area, as they do along coastline on each side (HPT County Inventory). John Boulton records the presence of a large old kaika at "Pahee", with about 40 or 50 houses in 1826; he also includes a description. The kaika "stands about 250 yards from the seaside on rising ground; at the back of the settlement is a woody hill" (Stark 1986). Thompson records the village as a Maori trading place linked by a track from the headwaters of the Waiau River to Milford Sound giving access to the highly prized greenstone found there (in Starke, 1986).

This coastline is a traditional area for Maori shellfish gathering (see MAF reference later).

Site Importance: International National **Regional** Local Unknown

Comment:

The geological features are of regional significance as are the spiritual values (pers obs).

Existing Threats:

Type and Comment: dij

Paua stocks here have been subject to heavy pressure from both commercial and recreational fishermen. They are commonly used when divers are precluded by weather from fishing further afield (Tidey and Bennett pers comm). Requests for paua in excess of quota for Maori hui are usually for this area. (MAFFish, in DOC Resource Inventory Southland and Conservancy RI375). Stock graze the coastline freely, threatening the coastal turf communities (B Rance pers comm). The dumping of dead sheep down a bank onto the coast occurs on Maori land here (T Tidey pers comm).

Human Modification and Human Use: adhij

A local surf club use Cosy Nook as a base. Here too is a small settlement of cribs, a slipway, and a shed used as a base by a local commercial fisherman. Another slipway at Gardens Bay is used by recreational boaties. Boating, fishing, diving and shellfish gathering all occur around this coast. (Tidey and Bennett pers comm.)

Existing Protection:

Type and Comment: adi

1. Pahia Scenic Reserve, 154ha of podocarp / kamahi forest on the hill overlooking Te WaeWae Bay.
2. From Monkey Island to Old Man Rock and 1/2 mile to seaward of MHW is closed to commercial kina fishing. This is a proposed rahui area.
3. A legal unformed road runs along much of the coast.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	⑥	7
Cultural	①	2	3	4	5	6	7
Historic	①	2	3	4	5	6	7
Threats	1	2	3	4	5	⑥	7
Human Mod. & Use	1	2	3	4	5	⑥	7

- 1 Derived information from existing literature and databases.
- 2 Derived information as above and field check.
- 3 Derived from existing maps and aerial photographs.
- 4 Recent DOC survey including sampling and analysis.
- 5 Recent DOC survey excluding sampling and analysis.
- 6 Experience.
- 7 Expert Opinion.

Comment:

Local DOC Staff with experience of this area are Trevor Tidey and Barry Bennett. (Tuatapere Field Centre)

Daphne Lee, University of Otago, Geology Department.
 Peter McLelland, DOC, Invercargill Field Centre.
 Kelly Davis, MAFFish South contract worker.
 Brian Rance, DOC, Southland Conservancy office, Invercargill

Recorded on Existing Databases: Comment:

- 1 WERI
- ② SSWI)
- ③ PNA) Pahia Hill Forest
- 4 Geopreservation
- ⑤ HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**References****Accompanying Maps and Photographs:**

Site Names: Te Wae Wae Bay Coastal

Site No: 140042

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: S175 17200 22500

Date: 16 March 1990

Brief Description of Site:

Te Wae Wae is a large embayment extending from Monkey Island to the Track Burn area north of Port Craig. The bay contains a range of shore types from gravel, cobble and boulder beaches north of Port Craig and adjacent to the Waiau River, between these the beaches are flat and fine grained (King et al 1985). In all Te Wae Wae Beach is around 22km long.

East of the Waiau River the gravel beaches tend to be mixed with sand. The original catchment area of the Waiau River was 8086km, the largest in Southland, but the Manapouri power scheme, and Mararoa weir have diverted much of the flow, reducing the effective catchment to 2095km; in times of flood excess flow is channelled into the Waiau. The reduced flow is not always sufficient to keep the river mouth open (McRae, 1979). Around the river mouth, the narrow Waiau lagoon extends about 5km to the south end and 1.5 to the north-west. This lagoon is separated from the sea by a shingle bar. The river mouth is of braided shingle and sand. The mouth migrates eastward after southerly storms.

To the west of the bay, bush covered slopes come down to the road along the beach. East of Waikoua, high mudstone escarpment backs the road along the shore; between Waikoua and Rowallan the road is washed out. To the east of the Waiau, the beach is again backed by a mudstone escarpment, with the area behind farmed. The other main use of this coast is recreational.

Conservation Values:

Natural: bcdefghi

Cultural: ad

Historic: bc

Comment:

Hectors dolphins are regularly seen in the western inshore area of Te Wae Wae Bay - pods of 40 animals have been counted. (T Tidey, pers comm). Up to 300 animals are believed to live and breed in the bay (Hectors dolphin plan, DOC) These species are rare, although they do not have a recognised conservation status. The Te Wae Wae Bay area is regularly visited by geology Students from Otago University (Daphne Lee pers. comm.).

Geological formations of interest in the area include Kapitean fauna, from the upper Miocene at Blue Cliffs and diverse macrofauna from the Pliocene both exposed in coastal cliffs (Geopreservation Index). At Orepuke garnet stones are found in the beach sands. The beach is highly mobile, and has changed dramatically in the last year; locals have attributed this to the flow diverted for hydro-electricity. (T Tidey pers comm). Toheroa occur at two places - one in the west near the Rowallan Burn and a transplanted colony near Orepuke; these are monitored by MAF. Sooty shearwaters feed in the bay in large numbers (T Tidey and B Bennett pers comm).

The Waiau lagoon and river mouth is used by a range of waterfowl and other water birds, up to 2000 waterfowl at times; the area (around 250ha) is representative of habitat scarce in this region (SSWI). At the river mouth are nesting sites of white-fronted tern, black-backed gulls and spotted shags. Banded dotterell also use the area. In the lagoon are found flounder, mullet, brown trout, eels, inanga and smelt; occasionally rainbow trout and rarely Atlantic Salmon are found in the tidal and lower reaches of the Waiau River. This area is ranked by the Wetlands of National Importance to Fisheries database as B- significant. The area appears to be a nursery area for fish. (WNIF; WERI; SUC, 1983). The garnet stones at Orepuke were a traditional source of hammer stones for the Maoris (R Beck pers comm).

The Te Wae Wae area was well used by the Maoris. The Waiiau mouth was Te Tua-a-huta and located here was Kai-namu a fishing camp. The Waiiau was also used as a route to Fiordland, Milford Sound in particular where tangiwai (boweite) was gathered. (Beattie 1949). Te Wae Wae Bay was named by whalers after a chief of that name. Te Wae Wae's village was Te Tuaote Hatu on the west side of the Waiiau mouth (Beattie in Stark 1986). A number of Maori archaeological sites are present in this area (HPT County Inventory). Te Wae Wae also has a rich history associated with early European mining. Monkey Island was the first site of the Orepuki township which was moved when the area was extensively mined for alluvial gold from the 1870s. Workings stretched from here towards the Waiiau Mouth, and inland to Round Hill where there was also a large Chinese mining settlement for many years. A shale oil extraction industry was based at Orepuki from 1889-1902. There are numerous archaeological site records relating to these mining activities (Harnell, 1983).

The Waiiau River and Mouth and also the Waikoua River area are proposed taiapure areas (K Davis pers comm). Monkey Island is known to have spiritual significance but the reasons for this aren't known. Sperm whales are commonly washed up in Te Wae Wae Bay especially in January/February of each year. (T Tidey pers comm).

Site Importance: International National **Regional** Local Unknown

Comment:

This area is of at least regional importance because of the natural and Maori values.

Hectors dolphins are probably of national significance.

Existing Threats:

Type and Comment: acfim

Erosion is occurring along much of the bay, particularly between Rowallan Burn and Waikoua, and towards Orepuke where the coastal road runs along atop the sedimentary cliffs. (T Tidey pers comm).

Marram grows along much of the beach area, with lupins behind. Lupin and broom are also growing on the islands in the Waiiau River. Dumping of dead sheep into streams that enter the lagoon is a problem. There is also a dump site near the lagoon. Much marine rubbish and plastic washes up in Te Wae Wae Bay and is funnelled into stream mouths - at sea this is a threat to wildlife (Ibid).

Mining occurs in the Orepuke area; here the beach sediments are only shallow, on a rocky base. Damaging fishing methods are the set netting inshore and commercial trawling that occurs in Te Wae Wae (Ibid).

Human Modification and Human Use: ahijk

Most of Te Wae Wae to the west of the Waiiau is pastoral farming. Some bush clearance has occurred west to the Waikoua River area. Around the river mouth is a settlement of permanent huts. The lagoon is used for a range of activities - speed boating, fishing for whitebait, trout, salmon, flounder, eels and mullet, also duck shooting. (WNIF, Southland Acclimatisation Society Submission to Southland County Council). The area continues to be used by local maoris.

The whitebait fishery uses scoop nets only, not stands (WNIF) and is a traditional Southland fishery. Toheroa are gathered from the beach when a season is opened (not recently). The western end of the beach is an important access point to the Port - Craig/South Coast track to Puysegur. Commercial fishermen anchor off Orepuki in easterly weather (T Tidey pers comm).

Existing Protection:

Type and Comment: adi

1. Fisheries Regulations control the limits and seasons for toheroa take.
2. From Monkey Island east to Old Man Rock and 1/2 mile seaward is closed to commercial kina fishing under Fisheries Regulations.
3. A legal road runs along the coast for much of the beach.
4. An area of stewardship land occurs around Orepuke and also at the western end.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	①	2	3	2 Limited information (general).
Threats	1	②	3	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	⑦	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion. Russel Beck.

Comment:

Local DOC Staff with experience related to this area are Trevor Tidy and Barry Bennett (Tuatapere Field Centre)

Daphne Lee, Department of Geology, Otago University
Kelly Davis MAFfish south contract worker, Dunedin
Russell Beck Southland Museum

Recorded on Existing Databases: Comment:

- ① WERI
- ② SSWI
- 3 PNA
- ④ Geopreservation
- ⑤ HPT County Inventories
- ⑥ Other - wetlands of National Importance to Fisheries
- 7 None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Port Craig - Sandhill Point

Site No: 140043

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: S175 15100 21000

Date: 16 March 1990

Brief Description of Site:

This site extends from Track Burn at the west end of Te Wae Wae Bay to mixed sand and gravel beach west of Sandhill Point. Along the west side of Te Wae Wae, the rocky shores overlies Tertiary sediments; the complexity of the exposed rock structure (which erodes relatively easily) and the comparative shelter of the shore gives rise to a very rich shore habitat of broken rocks and rock pools. Blowholes Beach, 1km long, is the largest of several small sand beaches between Port Craig and Track Burn. A small dune 4m high occurs here. At Sandhill Point there are extensive reefs and isolated foredunes rise from a sandy beach 0.6km long. Small plains of sand, pebbles and midden material occur among the dunes. The coastline of this site is backed by coastal podocarp forest. A small cleared area occurs around the old mill and settlement site at Port Craig.

The main use of this coast is by trampers, hunters and fishermen.

Conservation Values: **Natural:** abcde **Cultural:** abc **Historic:** ab

Comment:

This area has a high degree of naturalness, with an extensive forest area and intact vegetation sequences. Both Blowholes Beach and Sandhill Point support good populations of pingao on the dunes (occasional patches of marram are present). The shore spurge *Euphorbia glauca* is also present at Sandhill Point (Johnson, 1984). Pingao and shore spurge are both classified as rare (Given, 1990). Sandhill Point dunes are environmentally fragile.

A beach platform and cliffs at Port Craig have a diverse Kapitean shallow water fauna exposed. Nearby on the coastal platform and cliffs is a good example of an Oligocene flysch overlain by a breccia; Pliocene sequence unconformity overlaps the flysch onto basement amphibolite (Geopreservation Index). This area is visited regularly by Otago University Geology Students (Daphne Lee, pers. comm.). There is a faultline near Sandhill Point between sandstone and volcanic rock types (T Tidey pers comm).

Seals haulout in the vicinity of Sandhill Point (Ibid). Little is recorded about seabird use of this area. Sperm whales are commonly washed up in Te Wae Wae Bay and as far west as Sandhill Point especially in January/February of each year (Ibid).

Maori archaeological sites are scattered along this coastline including a whata (HPT County Inventory). The Sandhill Point historic reserve contains important sites (Coutts, 1970). The point was a popular stopover point for pre-European Maoris during expeditions along this part of the Southland coast, as there was good fishing in the area and the point afforded shelter and water. Surviving evidence indicates camp sites of considerable antiquity (SUC, 1983). The Port Craig to Sandhill Point coastline is proposed as a rahui area by the tangata whenua (K Davis pers comm). Port Craig (Mussel Beach) is a traditional kaimoana site. Te Whata was a traditional landing place for canoes and Te Haka - pureirei was the name of a settlement near Mussel Beach (Beattie 1949). A large sawmill and adjacent settlement was built at Mussel Beach, Port Craig in the 1920s, in order to log the surrounding coastal podocarp forest. At the time this sawmill had the largest mill output in NZ. The sawn timber was loaded onto ships at an adjacent wharf. Several impressive wooden viaducts still exist along the paper road that the tramping track now follows. The track was constructed by the government in 1896 as an alternative to the unreliable shipping service, servicing gold mining settlements in Preservation Inlet (Hall-Jones 1979). At Port Craig the old schoolhouse is used as a tramping hut. Schools and Scout

groups from Western Southland regularly use the Port Craig-Sandhill Point area (T Tidey pers comm). Sandhill Point is an attractive area, an open area of sand dunes capping a prominent headland with a spectacular view of the rocky coast.

Site Importance: International National Regional Local Unknown

Comment:

This area is of at least regional importance - for its geological, historical and landscape values and the biological values of Sandhill Point. Because of the pingao and shore spurge it is of national importance.

Existing Threats:

Type and Comment: acdim

At Sandhill Point natural erosion of the dunes periodically uncovers Maori material; (Coutts 1970) here marram and lupin threaten the biological values of the dunes (Johnson 1984). Gorse is also present on the regenerating area around Port Craig and on a few headlands. (T Tidey, pers comm)

Possoms, deer and pigs are widespread along this coast. Paua stocks have been heavily harvested along this shore, by both recreational and commercial divers. (T Tidey and B Bennett, pers comm)

The possible logging of Maori land which extends to the east of Sandhill Point, is of great concern at present; this would severely threaten coastal values. (Ibid)

Human Modification and Human Use: dhi

Tramping and hunting are popular activities in this area. The tramping track is well used (more than 1000 people per year). A track also leads up to the Hump Range.

Along the coast recreational fishing and diving, from boats is carried out; Commercial fishing and paua diving also occur. There are moorings at Port Craig used by fishing boats.

An old slipway exists at Trackburn (Ibid).

Existing Protection:

Type and Comment: ai

1. This area is stewardship land to west of Port Craig.
2. Sandhill Point is a Historical Reserve.
(An area of Maori land also occurs between Sandhill Point and Port Craig).

Availability of Information:

Natural	①	2	3	
Cultural	1	2	③	1 Well documented.
Historic	1	②	3	2 Limited information (general).
Threats	1	②	3	3 Little information (if any).
Human Mod. & Use	1	②	3	

Comment:**Sources of Information:**

Natural	①	2	3	4	5	⑥	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	⑦	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	⑥	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
	①	2	3	4	5	⑥	7	6 Experience.
								7 Expert Opinion.

Comment:

Russell Beck)Southland Museum.
Karl Gillies)

More information is required on the marine values of this area. Local DOC Staff Trevor Tidey, Barry Bennett (Tuatapere Field Centre) and Brian Rance (Southland Conservancy office, Invercargill) have knowledge of this area.

Daphne Lee, Geology Department, University of Otago
Kelly Davis, MAFfish South contract worker, Dunedin

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- ③ PNA - Sandhill Point
- ④ Geopreservation - including fossils inventory.
- ⑤ HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**Accompanying Maps and Photographs:**

Site Names: Waitutu / Wairaurahiri

Site No: 140044

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: S174 13000 21500

Date: 16 March 1990

Brief Description of Site:

This site extends from the rocky shore east of Wairaurahiri westward to the Waitutu River. Along the shore are extensive intertidal rock shelves, coastal sea cliffs and a continuous narrow strip of low forest and shrubland, backed by dense podocarp forest. Small areas of sand and open shrubland occur around the river mouths. The Waitutu River drains Lake Poteriteri and the Wairaurahiri, Lake Hauoko; several other streams drain the hinterland as well. The lowlands consist of a series of marine terraces constructed of mudstone and sandstone capped by a layer of coarse gravels. The coastal forests principally occupy glacial outwash terraces deriving from the glaciers formerly occupying Lakes Poteriteri and Hauoko.

This area is used occasionally by trampers, hunters and fishermen.

Conservation Values:

Natural: abcdei

Cultural: abc

Historic: ab

Comment:

Ecologically the most important geological feature in this area is these flights of marine terraces cut into the soft Tertiary rocks. Each terrace represents the gently sloping shore platform and shallow sea floor beyond, subsequently uplifted by tectonic earth movements (Ward quoted in Sanson 1983). The terraces east of Wairaurahiri are deeply cut by stream entrenchment with exposure of underlying mudstones and silt stones. The youngest terraces are still forming as the waves wear back the soft 30m cliffs, leaving a broad intertidal rock platform which in many parts extend hundreds of metres off shore (Ward in Forest and Bird No 226 Vol 14 No 4). The Geopreservation Index (active earth deformation sites) ranks the terrace sequence as of national importance. This coast is vulnerable to disruptions to the natural coastal processes. The forests of this region represent the most extensive area of Southland's remaining lowland pure podocarp and podocarp-beech forest; on coastal terraces dense rimu forest predominates (Sanson 1983). Fiordland crested and little blue penguins breed along the coast (McEwen 1987). There is a fine pingao sedgeland on a small dune area at the west mouth of the Wairaurahiri River, also at the Waitutu River mouth (Forest and Bird No 226, Vol 14, No 4; Johnson 1979; Department of Lands and Survey). Pingao is classed as a rare plant (Given 1990).

Too little is known of the true faunal values of this region, it is valuable habitat for bush birds such as kakas, parakeets and yellow heads (Forest and Bird article as above). A small estuarine wetland behind the Waitutu Beach is a breeding area for lampreys and giant kokopu.

Short-jawed kokopu which are also classified as rare (Ibid) occur three streams along the coast (McDowell and Richardson, 1978).

The marine terraces rising inland in a remarkable flight of terraces, the extensive lowland forests and extensive short platforms form a very distinctive landscape (Sanson, 1983). The terraces are one of the most well preserved sequences in new Zealand, giving detailed Quaternary uplift history (Geopreservation Index).

Maori archaeological sites are scattered along the coastal area; middens occur around the river mouths (HPT County Inventory). Long Point (Patupo) is said to be named after some act of warfare in the past. Several points along this coastline were probably used as stopovers during expeditions along the coast

(Beattie, 1949). A moa skeleton and human burials has been found along this coast (letter to Department of Lands and Survey from A J McKenzie, Southland Centennial Museum 5/12/69).

This site has high conservation values and investigation of the marine life, particularly of the remarkable intertidal and sublittoral fringe area is merited (pers obs). The track to Preservation Inlet constructed in 1896 (and described in CRI 140043) follows this coast also (pers obs.)

Site Importance: International National Regional Local Unknown

Comment:

The extremely high natural and landscape values of this impressive area including the pingao, and it's unique geological features are on national importance. (Geopreservation Index)

Existing Threats:

Type and Comment: adim

Paua stocks along the coast have been severely depleted by commercial divers; there has been an attendant population explosion of kina on the rock shelves (Bennett and Tidy pers comm).

Along the entire length of coastline there appears to be a process of active cliff retreat. In the forest immediately adjacent to the coastal cliff edges a large number of dead trees occur; the established forest is being destroyed by increasing exposure to saline winds as the soft mud and siltstone cliffs retreat (Sanson 1983). Possums and deer are widespread along the coast (Tidey and Bennett pers comm). The possible logging of Maori land which extends to the east of Sandhill Point is of great concern at present; this would severely threaten coastal values (Tidey and Bennett pers comm, pers obs).

Human Modification and Human Use: hi

The tramping track west to Big River and Puysegur follows a paper road. There are tramping huts at both Wairaurahiri and Waitutu. Jet boating occurs on these rivers as far south as the coast. Hunting (deer, pigs) occurs in the coastal forest and margins. Some recreational fishing occurs in this area, principally around the river mouths near the huts. (Tidy and Bennett pers comm.)

Deer are an increasing threat to the coastal forest; in the east pigs and possums are also present (Ibid). Access to the coast is by foot usually.

Existing Protection:

Type and Comment: a

Maori land adjoins most of the coastline; then to the west is stewardship land.

Availability of Information:

Natural	1	②	3	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Local DOC Staff with knowledge of this area are Trevor Tidey and Barry Bennett (Tuatapere Field Centre).

Recorded on Existing Databases: Comment:

1	WERI
2	SSWI
3	PNA
④	Geopreservation
⑤	HPT County Inventories (1986)
6	Other
7	None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Western Foveaux Shelf

Site No: 140045

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: 46deg. 15'S 166deg. 30'E

Date: 16 March 1990

Brief Description of Site:

This shelf extends southward from the southern tip of Five Fingers Peninsula in Fiordland, where the continental shelf widens significantly. The area is delineated seaward by the 12 mile limit and to the south by the Solander Trough into which the seabed plunges steeply. The Western Foveaux Shelf has a seabed of relatively uniform medium to fine sand, terrigenous sediments. In the east changes in depth and sediment distribution in the narrows of Foveaux Strait mark the beginning of the Foveaux Strait Shelf area (King et al, 1985). To the east of the SW tip of Fiordland the shelf merges into the Puysegur Trench which extends 250 miles southwest from the edge of the continental shelf (Stevens, 1980).

The Southland Current moves eastward around Puysegur Point and is split, part moving through the channel, the remaining current moving south. Water temperatures tend to be higher than to the east of Stewart Island where merging subantarctic water affects the current (King et al, 1985). the main use of this area is fishing.

Conservation Values:	Natural: c	Cultural:	Historic: c
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Comment:

Little is known of the conservation values of this area. Communities of *Scalpomactra scalpellum*, *Mactra ordinaria*, *Tawera spissa*, *Diplodonta globus* and *Glycymeris laticostata* - *Venericardia purpurata* have been reported (King et al, 1985).

Commercial stocks of the following fish species have been reported as present - tarakihi, elephant fish, gurnard, red cod, trumpeter, monk fish, rig, spiny dog fish, warehou, groper, ling, barracouta and mackerel. Seals, whales and seabirds are presumed to feed in this area (Tortell, 1981.)

The prime historical use of this area was whaling; the area within site of the Solander Islands was reported to be the best whaling grounds in the south (Gilroy.)

Site Importance:	International	National	Regional	Local	Unknown
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Comment:

Existing Threats:

Type and Comment: im

Principle fishing method used in these waters is trawling (Tortell 1981). The prime threats would be to seabirds, including penguins and to marine mammals feeding in this area. The depletion of food stocks needs to be considered. The disposal of rubbish at sea, particular plastics threatens these species (pers obs).

Human Modification and Human Use: k

Fishing; the area is part of MAFfish's Southern Fisheries Management area. The area south and west of the Solanders is reported as being fished by Joint Venture and Korean trawlers in spring, and by Joint Venture trawlers in late January (1980-81 records, Tortell).

Existing Protection:**Type and Comment:**

None except that this area is part of New Zealand's territorial sea.

Availability of Information:

Natural	1	2	③	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Further search for information on the marine values of this area is merited.

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	①	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	①	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	①	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	①	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases: Comment:**

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- ⑦ None

Other Considerations:

References

Accompanying Maps and Photographs:

Site Names: Solander Islands

Site No: 140046

Recorders Name: B Rance

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20430 53860

Date: 06 03 90

Brief Description of Site:

Big Solander Island is roughly triangular, being c.1.5km across and 340m high with an area of c.100ha.

A gently sloping summit plateau of 10ha is buttressed by sharp ridges which descend to coastal headlands and by faces with an average slope of 55degrees.

Little Solander Island is 2km west of Big Solander. It is oval in shape, c.8ha in area with a ridge to the summit, cliffed to the south, with less steep slopes to the north and east.

The Solanders are eroded remnants of an andesitic volcano, the rocky shores are of Pleistocene igneous rocks principally hornblend andesite flows. There is a blanket peat cover except on steep slopes. The area is characterised by a predominance of westerlies which brings frequent rain showers. The islands are situated on the northern edge of the Solander Trough.

Conservation Values:**Natural:** abcdefgh**Cultural:** acd**Historic:** c**Comment:****Natural**

- a) Neither island has any introduced mammals, Little Solander Island has no introduced weed species. Big Solander Island has weka (*Gallirallus australis scotti* - regionally threatened) which were introduced by sealers (Cooper, 1986). Sowthistle is the only introduced plant species. The islands are likely to have a diverse insect and lizard / gecko fauna (Miskelly, 1985).
- b) Little Solander Island contains punui (*Stilbocarpa robusta*) and the leach *Ornithobdella sp.* both are elsewhere only on the Snares (Cooper, 1985; Cooper 1986). Probably the southern most Gannet colony in the world and the only site where both Gannet and Mollymawks nest (Little Solander Island). Big Solander Island contains *Stilbocarpa lyallii*, (the only site within FNP) and Cooks Scurvy Grass (*Lepidium oleraceum*).
- c) The islands:

Contain New Zealand mainlands largest fur seal (*Arctocephalus forsteri*) colony, sealions (*Phocarctos hookeri* - status unclear, probably threatened) present.

Contain nearly half the known population of Bullers Mollymawk (*Diomedea b. bullerii*).

Contain significant populations of common Diving Petrel (*Pelecanoides urinatrix chathamensis*) (Cooper, 1986).
- d) Very fragile due to the density of burrows especially on Little Solander Island. Also vulnerable to the impact of introduced animals (Cooper, 1986).
- e) The islands are the eroded remains of an andesitic volcano, active as recently as 1 million years ago (Reay, 1986).

- f) Representative of the original vegetation of Foveaux Strait (Rance B. - pers.comm.).
- g) One of the least modified Island groups in the New Zealand biogeographic zone (Cooper, 1986).
- h) Biogeographically has a close faunal/floral relationship with Foveaux Strait Island, Muttonbird Island and The Snares (Cooper, 1986).
- i) The islands are known to have once had red coral *Order Stylasterina* on the subtidal faces, as fishermen have hauled it up on their pots (Fisher V. - pers.comm.). Otherwise little is known of the marine life. Large crays *Jasus edwardsii* are reported to be caught in the area.

Historic

The Solanders were sealed historically, one sealing gang was marooned there for 5 years (Cooper, 1986; Johnsons, 1974). One of the best whaling grounds in the south was said to be within sight of the Solanders. No shipwrecks known.

Cultural

Important seascape, visible from the south coast, Southland; part of the legend of Kiwa, whale who widened Foveaux Strait, Solander Island is his eye tooth which fell out (Beattie, 1954). On the island was a Maori canoe landing site.

Site Importance:	<u>International</u>	National	Regional	Local	Unknown
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Comment:

One of the least modified island groups in the New Zealand Biogeographic zone.

Contains the rare plants species (Cooks Scurvy Grass - *Stilbocarpa robusta* and *S. lyallii*).

Contains important seal breeding.

Important distribution for several species (Plants: *Stilbocarpa lyallii* (vulnerable), *S. robusta* (endangered), Stewart Island Tree Groundsel (*Brachyglottis stewartiae* - local endemic), leach *Ornithobdella sp.*, Gannet). As part of the nomination of South West New Zealand as a World Heritage site this area is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: m

Threat of predators or introduced/invasive plants establishing.

Weka will continue to effect the burrowing and ground nesting birds (Johnsons, 1974).

Human Modification and Human Use: k

The islands were sealed, otherwise very rarely visited. Commercial divers are known to have harvested paua, but generally sea conditions make inshore access difficult. Marine pollution does accumulate (Johnsons, 1976).

A few crayfishermen regularly set pots around the islands, close in.

Existing Protection:**Type and Comment: a**

Entire land area is protected as part of Fiordland National Park; a special area with entry by permit only. Anamolous protection - it probably should be nature reserve as is Codfish Island and other areas with similar needs for protection.

Availability of Information:

Natural	<u>1</u>	2	3	
Cultural	1	2	<u>3</u>	1 Well documented.
Historic	1	2	<u>3</u>	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

In view of the reports of red coral, and the likelihood of other interesting Fosterian marine life, a subtidal investigation of the islands is merited.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey including sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

References on attached sheet. These pertain only to land and fauna values. There is little information about marine values.

Recorded on Existing Databases: Comment:

1	WERI Little information on existing databases.
2	SSWI
3	<u>PNA Solanders Ecol. Dis. 1973 Scientific Nature Reserve</u>
4	Geopreservation
5	HPT County Inventories
6	Other
7	None

Other Considerations:

References

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12. Reed, J.J. 1950. Hornblende Andesite Rocks from Solander Island Transactions of the Royal Society of New Zealand 79:119-125.
13. Southland Museum Newsletter, 1985. Friends of the Museum Newsletter.
14. Wilson, G.J. 1973. Birds of the Solander Islands. Notornis 20.
15. Johnson, P.N.; Nilsson, R.J. 1975. The forgotten Solander Islands. Forest and Bird No. 195.
16. Gilroy, P. Voyage of the Cachalot.

Accompanying Maps and Photographs:

Site Name: South Coast Fiordland

Site No: 140047

Recorders Name: Simon Hayes / Jane Hare

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20350 54260

Date: 01 04 90

Brief Description of Site:

This site comprises a long stretch of coastline extending over 30 km from Gates Harbour to the Waitutu River. It includes the mouths of several creeks, also Big River which drains Lake Hakapoua, the southern most and most remote of Fiordland's lakes. The coastline is rugged and exposed, with sandy and stony beaches, and to the west particularly, extensive wave-cut platforms. Coastal rock types are principally Kakapo granite, with a small area of softer silty sandstones around the Green Islet and Long Reef Point areas and schist at Big River (Wood, 1979). Inland, beech forest predominates, with a fringe of manuka (*Leptospermum scoparium*) along the cliff tops. This coastline has high scenic values, particularly the Green Islets area where there is a spectacular arch and cave system and coastal stacks. The Southland current flows eastward here into Foveaux Strait.

Conservation Values:

Natural: abcdeg

Cultural: abcd

Historic: bc

Comment:

While some parts of this coast have been burnt off in the past, most of this coast remains in a relatively unmodified state with a high degree of naturalness and high aesthetic and landscape values.

Significant sand dunes occur at the Kiwi Burn mouth, the west side of Green Islets, and at the Big River mouth. Pingao (*Desmoschoenus spiralis* - a rare sand-sedge) has been recorded on these dunes at the Kiwi Burn mouth, Green Islets and Big River. A vulnerable dune plant sand spurge (*Euphorbia glauca*) has been recorded growing in large clumps at the Kiwi Burn mouth (Johnson, 1979). S. I. kaka (*Nestor meridionalis meridionalis* - regionally rare) and NZ falcon (*Falco novaeseelandiae* - threatened) have been recorded in various areas along the south coast though there have not been any breeding sites documented. The eastern limit for Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) on the South Island appears to be west from the Aan River (Morrison) NZ fur seal (*Arctocephalus forsteri*) haulouts occur throughout the length of this coastline - particularly notable areas include the Green Islets, and the Big River mouth (more than 100 individuals estimated in 1973) (Wilson, 1981).

This area has a number of geological features that are of scenic or scientific interest. Long Reef is a long prominent, wave-eroded rocky outcrop. The Green Islets include attractive and very large mudstone sea arches and a large number of small rock stacks just offshore. At Knife and Steel Harbour and other parts of the coastline there are attractive and extensive wave-cut platforms (Mutch, 1984). Wave-cut notches that occur at the Green Islets are of international scientific interest. At the mouth of Lake Hakapoua there is an extensive debris dam (B46/419308) which is of at least regional importance (Geopreservation).

According to Herries Beattie, there is no doubt that all this south coast was thoroughly known to the Maori; although usually visited in canoes there is a record of a war-party walking to Preservation Inlet and back. Many of the headlands and harbours have Maori names, several associated with food sources here such as the weka (Beattie, 1949).

There are some significant historical and archaeological sites in this area. At the mouth of the Andrew Burn there are some large caves with large middens and artefacts associated with early Maori occupation over a long period of time. Another important site is recorded at the Grace Burn which includes a rock shelter with a large concentrated midden associated with early Maori occupation. (McGovern, 1985). There are several hut sites recorded in Gates Harbour that were associated with early gold prospecting in the area

(McGovern, 1985).

Site Importance: International National Regional Local Unknown

Comment:

In addition to the fact that much of this site is part of the Fiordland National Park and a proposed World Heritage site, the important geological features and largely unmodified coast merit this sites inclusion under international importance. (D.O.C., 1989).

Existing Threats:

Type and Comment: cdim

Up to 9 species of weeds including blackberry (*Rubus fruticosus* agg.), foxgloves (*Digitalis purpurea*), gorse (*Ulex europaeus*) and marram grass (*Ammophila arenaria*) were recorded by Johnson (1979) at the mouth of the Gold Burn, the west side of Green Islets Peninsula, the mouth of the Big river, and at Long Point - Johnson also noted heavy deer and pig browsing present at almost all these sites. Unfortunately the largely unsurveyed Andrew Burn archaeological sites are well known and have been extensively fossicked in recent years. The steep mudstone cliffs backing most of this site are being heavily eroded by natural forces - notably the prevailing westerly wind. Paua diving, both commercial and amateur, has had significant impact on paua resources of the south coast (Hays/Hare - pers. obs.).

Human Modification and Human Use: dkh

Commercial fishing for rock lobster (*Uasus edwardsii*), paua (*Haliotis iris*), and a number of fin fish (notably blue cod (*Paraperis colias*), flat fish, star-gazers, shark, rig, elephant fish and red gurnard (*Chelidonichthys kumu*) occurs along this coast (Ward, Shaw). There are a number of anchorage sites utilised by local fishing vessels throughout the length of this coast including Green Islets and Big River (Voller, 1984). The south coast walking track to Lake Hakapoua is a popular coastal tramp for experienced trampers following the pioneering route through to Preservation Inlet associated with early gold and coal mining area. Some areas of coastal forest (notably in the west end of the site) have been extensively modified by deer/pigs, invasive weeds, and fire. Much of the western coastal forest is regenerating from early burnoffs. (Johnson, 1979).

Existing Protection:

Type and Comment: ad

Much of this site borders on the Fiordland National Park to Big River in the east, though this protection does not extend below the mean high water mark. The remainder of the coast to the east is DOC stewardship land that was originally part of the Waitutu.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	3	3 Little information (if any).
Human Mod. & Use	1	2	<u>3</u>	

Comment:

There is little information available on the subtidal or intertidal ecology of this site at present.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases: Comment:**

1	WERI
2	SSWI
<u>3</u>	<u>PNA - Preservation Ecol. Dis. 1904 National Park</u>
<u>4</u>	<u>Geopreservation</u>
5	HPT County Inventories
6	Other

Other Considerations:**References**

- Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. DSIR Dunedin.
- Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers.comm. (C/- P.O MacAndrew Bay, Dunedin).
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9. Wood, B.L. 1960. Geological map of New Zealand SH27. N.Z. Geol. Surv. D.S.I.R.
10. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage list. Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Name: Sealers Creek/Puysegur

Site No: 140048

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20180 54320

Date: 02 04 90

Brief Description of Site:

This site extends from Puysegur Point to Gates Harbour, along the south coast of Fiordland; a length of 18 km, inland it includes Sealers Creeks 1 and 2, and small creeks to the east, but not the coastline of Preservation Inlet which is site 14049. The coastline is predominantly high resistant rock and cliffed shore, with some extensive coastal platforms in places, particularly around Gates Harbour. The geology is similar to that to the north part of the Fiordland complex. Sealers Creeks enter the sea together; here there is a sandy beach, with a small foredune and lateral dunes up the valley sides for 200m. This coastline is one of the windiest in New Zealand. The Southland current travels eastward here into Foveaux Strait. The vegetation is primarily beech and podocarp beech forest. The inland area is rich in historical sites, from a period of mining in the late 1800s; the Maoris and sealers also used the coast extensively.

Conservation Values: Natural: abcdeg Cultural: abcd Historic: abc

Comment:

Ancient marine terraces extend inland from Puysegur Point along this coastline. (These have a recorded rate of uplift which has been used in national correlations) (Geopreservation data base).

On the Sealers Creeks dunes the rare plants pingao (*Desmoschoenus spiralis*) and sand spurge (*Euphorbia glauca*), along with club rush (*Scirpus nodosus*) are dominant (Johnson, 1979).

All this coastline has high natural values, and considerable aesthetic and landscape value. There is little recorded about other natural values of this area. Fiordland Crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) breed along the coast. The Sealers Creeks area and also Wilson River and small creeks around Puysegur Point, were extensively goldmined in the period from the late 1880s - 1890s. At Gates Harbour, which was also prospected, there were camps, stores and at least one boarding house by 1892. In the early 1800s rock shelters along the coast were used by sealing gangs left here. Gates Harbour is probably named for the sealing ship the General Gates, Captain Abimeleck Riggs which left sealing gangs in Fiordland in the 1820s. Several archaeological sites are known from this area, particularly inland along Sealers and McNamara Creeks, where prospecting occurred (McGovern-Wilson, 1985).

The Maori name for Sealers Creek No. 1 was Te Papa - meaning the seals gathering place or rookery. Gates Harbour was known as Te Whaka-a-timuraki - the labouring of Timuraki. Beattie reports that there is no doubt that all this south coast was thoroughly known to the Maori; although usually visited in canoes there is a record of a war-party walking along the coast to Preservation and back (Beatties, 1949).

There are no recorded shipwrecks from this area, however at least five fishing vessels have been lost off this treacherous coast (Ingram, 1977.)

Site Importance: International National Regional Local Unknown

Comment:

As part of Fiordland National Park (which is included in a nomination for World Heritage Status) and because of the extremely high natural values of this area, the site is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: m

There has already been fossicking of archaeological sites along the coast; further damage is likely as the anchorage at Gates Harbour is well used (McGovern-Wilson, 1985).

Human Modification and Human Use: dhk

Gates Harbour is a commonly used anchorage. The lighthouse on Puysegur Point is the most remote and isolated coastal light station in New Zealand; it was manned until recently. Whilst some of the buildings here have been destroyed, the lighthouse and keepers house still remain. Rubbish has been dumped over a bank here. This area is fished for crayfish (*Jasus edwardsii*), although the winds make this extremely tough at times. An old land route to Puysegur Point from Port Craig is used occasionally by tramping parties. This follows a line of a pack trail constructed in 1897 to service settlements in Preservation Inlet, from Te Wae Wae. Charter vessels often stop to allow tourists to visit the Puysegur Point lighthouse site and the historic gravesite of James Cromarty in the same area. (McGovern-Wilson, 1985). This area has been commercially dived for paua (*Haliotis iris*).

Existing Protection:

Type and Comment: a

This site is part of Fiordland National Park, which extends down to mean high water only.

Availability of Information:

Natural	1	2	<u>3</u>	
Cultural	1	2	<u>3</u>	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod.& Use	1	2	<u>3</u>	

Comment:

Little specific information is available. There is little information available on the intertidal or subtidal ecology of this area.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	<u>1</u>	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience
								7 Expert Opinion.

Comment:

This area has been surveyed for archaeological sites.

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA Preservation Ecological District. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:

Although Johnson reported that marram (*Ammophila arenaria*) was not present at Sealers Creeks in 1977, this would require checking, because of the time lapse.

References

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, DSIR, Dunedin.
2. McGovern-Wilson, R. 1985. Fiordland National Park Gazetteer of Historic and Archaeological Sites, Dept. of Lands and Survey, Invercargill.
3. Beatties, H. 1949. The Maoris and Fiordland.
4. McEwen, M. 1987. Ecological Regions and Districts of New Zealand, Sheet 4. Department of Conservation, N.Z. Biological Resources Centre.
5. Wood, B.L. 1960. Geological Map of New Zealand, Sheet 27.
6. Ingram, C.W.N. 1977. New Zealand Shipwrecks: 1795-1975, 5th Ed. A.H. and A.W. Reed, Wellington.
7. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Preservation Inlet

Site No: 140049

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20220 54410

Date: 30 03 90

Brief Description of Site:

While Preservation Inlet is similar to other northern fiords, with a glacially formed 'U' shape and basins formed behind a shallow entrance (a morainic rock sill), its entrance is different to the northern fiords, being very wide and noticeably less precipitous. The fiord extends about 36 km inland where it is divided up into Isthmus Sound to the north and Long Sound to the south. The rocky shoreline, with rugged points at Gulches Head and Cavern Head, is broken by gravel beaches and sandy bays; the main bed rock being greywacke and argillite/hard mudstone. Gneiss walls make up the sides of Long Sound. While beach forest is the dominant vegetation here, there is a fringe of rata and lowland podocarps around the coast. In all, Preservation Inlet covers an area of 93 sq. km. with a maximum depth of 371m. The hydrology within the fiord is estuarine with a large fresh water run off on the surface and a very slow deep sea water circulation underneath.

Conservation Values:

Natural: abcdgh

Cultural: abcd

Historic: babc

Comment:

This is a remote area with a high degree of naturalness. The subtidal communities living on the fiord walls are unique in NZ and consist almost entirely of sessile suspension feeders in the depths between 5 and 40m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - threatened interationally by I.U.C.N. D.O.C., 1989) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities and their dependence on the terrestrial surroundings is of international scientific interest (Grange 1990, and Wells). At the sill to Narrow Bend (Long Sound) there are large numbers of the brachiopod *Neothyris lenticularis lenticularis*.

In Fiordland this species has only been recorded in these middle shallower reaches of Preservation Inlet. Sea pens (*Sarcophyllum sp.*) have also been recorded in diving depths in this area, and these appear to be a different undescribed species to those found in Doubtful Sound (Grange, 1990). The most northerly sighting of a Southern pigfish (*Congiopodus leucopaecilus*) on the Fiordland coast has been at Steep-To Island. In the shallow area between Steep-To and Coal Island there is a large and extensive tua-tua (*Paphies spp.*) bed (Shaw). Historically Blind Passage was known as an area where crayfish assembled in their millions (Beattie).

NZ falcon (*Falco novaeseelandiae*) have been sighted at the mouth of the Richard Burn (Long Sound), Dawson Burn and Trevacon Head (this is a threatened species). S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare) have been recorded at Cromarty and Coal Island in coastal forest. Yellow head (*Mohoua ochrocephala* - threatened) have been recorded at the mouth of the Dawson Burn. Sooty shearwaters (*Puffinus griseus*) have been recorded breeding at the Spit Island, Round Island, and a islet off the south west end of the Cording Islands. Mottled petrels (*Pterodroma inexpectata*) are known to be breeding off a small stack in Isthmus Sound. Variable oyster catchers (*Haematopus unicolor*), a rare species, has been recorded in large numbers on a small islet south west of the Cording Islands. Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) breed on Cording, Weka, Round and Coal Islands (McGovern-Wilson, 1985). Small dune systems with the rare native sand sedge pingao (*Desmoschoenus spiralis*) present occur at Welcome Bay, Te Whara beach and on the Spit Islands. Another rare dune plant - sand spurge (*Euphorbia glauca*) - is recorded on the

Spit Islands, Te Oneroa, and Kisbee Bay. Hutu (*Ascarina lucida*), a plant found at Kisbee Bay, is at its southern limit here and Sand Daphne (*Pimelea lyallii*) is found here at its northern limit (Johnson, 1979).

There is an exceptional assemblage of filter feeders on steep walls under Trevacoona Head and around Last Cove (Long Sound), including large numbers of *Liothyrella neozelanica* (a white brachiopod), pink, red and white hydro corals (*Order Stylasterina*) and large gorgonians (Grange).

As with all of Fiordland this area has high aesthetic and landscape value (see site record sheet for the outer coast of the northern fiords).

The Maori name for Preservation Inlet was Te Rama or Rakituma. The meaning of this has not been established. The overview of Fiordland's cultural values details the Maori legend of how the god Tu created the fiords; in Preservation this task was finished by Maui. The Preservation area appears to have had extensive Maori usage. Evidence from archaeological sites in old sea caves shows the Foveaux Strait Maoris made seasonal expeditions to Preservation. The Cuttle Cove area is a very celebrated place in Maori history. It was known as Te Whara after a chief. The island at the cove's end, Mataura, was named after another famous chief who visited here; here Tarewai the renowned fighting chief of the Kai Tahu, was killed, about 1780AD. The fort or pa on this island was known as Te Pa-a-te-whara.

There are two counts of petrified men being found - one at Cuttle Cove and one at Cavern Head. At Cavern Head the petrified man (reportedly Tarewai) and a mere were found in a cave in 1877. However, the body was removed and reburied soon after the body was reported. At Weka Island and Steep-To Island there are some large caves with middens showing signs of early Maori occupation. A large number of early Maori sites of occupation in this area are of particular importance due to the fact they remain undisturbed (McGovern-Wilson, 1981).

Preservation Inlet is rich with early European history and prehistoric Maori history, reflected in the 69 sites that have been recorded to date within the area. Cuttle Cove near Isthmus Sound entrance is the site of NZ's first European whaling station built for George Bunn & Co. in 1829. The station continued whaling until 1840. The station and surrounding land from Dusky Sound to the southern head of Preservation Inlet were purchased from Tuhawaiki and this is the first documented European land purchase from the Maori in the South. Te Oneroa and Cromarty were two small settlements set up on the southern side of Preservation Inlet in response to a gold rush that occurred in the area just before the turn of the century. One of the most productive mines was the Morning Star mine which operated from 1894-1913. McIntyre's sawmill was built in 1894 and provided timber for local gold mines and Invercargill, from just south of Cromarty (McGovern-Wilson, 1981).

Site Importance:	<u>International</u>	National	Regional	Local	Unknown
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Comment:

The unique biological subtidal communities are of international scientific interest (Grange). As part of Fiordland National Park which is part of a nomination for World Heritage status and because of its high natural and historic values, this site is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cdfj

Johnson (1979) recorded 29 species of weeds around the historic gold mining townships at Kisbee Bay, including gorse (*Ulex europaeus*), broom (*Cytisus scoparius*) and blackberry (*Rubus fruticosus* agg.). Marram grass (*Ammophila arenaria*) has been recorded at Te Whara beach. Johnson also notes heavy deer and pig browsing in various areas around the mouth of the Inlet (Johnson, 1979).

There is an allocated fuel and rubbish dump utilised by local fishermen at Weka Island (Shaw). Seabed prospecting across the mouth of the Inlet has been sought, gained and carried out in recent years (D.O.C.).

Human Modification and Human Use: adhi

This area (notably the entrance to the Inlet) is under heavy pressure from commercial rock lobster fishing (Voller). There are a number of anchorages within the Inlet that are utilised mainly by local fishing vessels. Most significant are those at Useless Bay (Long Sound), entrance to Isthmus Sound, Cuttle Cove, Otago retreat and Weka Island (Ward). A recent "resort" has been set up on the private land in Cromarty offering time-share accommodation (Hayes - pers. obs.). Many tourist charter vessels stop in Preservation Inlet to allow visitors to see: the Morning Star Mine, Cuttle Cove whaling station site, Cromarty and Te Oneroa, historic mining sites on Coal Island, Puysegur Point lighthouse and an old pa site at the Spit Islands. Recreational fishing occurs around Cromarty (Shaw).

Existing Protection:

Type and Comment: ad

With the exception of several small sections at Cromarty, this site borders entirely on the Fiordland National Park, though this protection does not extend below the mean high water mark. Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	<u>1</u>	2	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod.& Use	1	<u>2</u>	3	

Comment:

This area has been surveyed for archaeological and historic sites (McGovern-Wilson, 1981).

Source of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and filed check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience
								7 Expert Opinion

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA Preservation Ecol. Dis. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:

Seabed prospecting could occur in the near future (D.O.C.).

References

1. Johnson, P.N. 1979. Vegetation of Fiordland beaches, Bot. Div. DSIR, Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O MacAndrew Bay, Dunedin).
3. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
4. Grange, K.R. pers. comm., C. Div. of Mar & Fr. water sciences, DSIR Wellington.
5. Shaw, L.C. DOC, Te Anau, Pers. comm.
6. McGovern-Wilson, R. 1985. Fiordland National Park. Gazetteer of Historical and Archaeological sites, Dept. of Lands and Survey, Invercargill.
7. Ward, J. and Shaw, L. 1983. Fiordland Coastal Anchorages, D.O.C.
8. Voller, R.W. Fisheries Southland Regional Planning Scheme Sect. 3 (included in the background papers).
9. Beattie, Herries. 1949 The Maoris and Fiordland; 1941 The Maoris of the South Island.
10. D.O.C. Office, Te Anau, on file.
11. Wells, S.M. International Union for Conservation Nature and Natural resources, Red data book for Invertebrates.
12. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Chalky Inlet / Edwardson & Cunaris Sound

Site No: 140050

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20170 54530

Date: 30 03 90

Brief Description of Site:

As with all the fiords, Chalky Inlet is characterised by a glacially formed 'U' shape with deep basins behind a shallow entrance formed by a morainic rock sill. As with all the southern fiords Chalky Inlet has a wide entrance and is noticeably less precipitous than those of the north. About 15km inland the inlet branches into two prominent arms; Edwardson and Cunaris Sounds each about 12km long. Altogether the site covers an area of 110sq km, and the maximum depth in Chalky Inlet is 374m. Greywacke with argillite outcrops are the main rock types from around Providence Rocks to the Chalky Inlet entrance, and at Cunaris Sound; (there are also areas of hard mudstone). Gneiss walls occur on the northern side of Chalky Inlet up to Edwardson Sound. The main vegetation type is beech forest with occasional podocarp (eg. rimu) and hardwood (eg. rata kamahi) coastal fringes. The hydrology within the inlet is estuarine with a large freshwater runoff on the surface and a slow seawater circulation underneath.

Conservation Values:

Natural: a b c d g h Cultural: a b c d

Historic: a b c

Comment:

This is a remote area with a high degree of naturalness. The subtidal communities living on the fiord walls are unique in NZ and consist almost entirely of sessile suspension feeders in the depths between 5 and 40m. The light-absorbing freshwater layer restricts algal growth and has allowed normally deepwater species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - a threatened species internationally by I.U.C.N. - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique nature of these communities and their dependence on the terrestrial surroundings is of international scientific interest (Grange 1990 and Wells). *Lepidoperca* sp. (orange lined perch) - a normally deep water fish has been recorded just south west of Small Craft Islands, within diving depths (Grange, 1990). Between North Port and Great Island, Western Passage, large numbers of rock lobster (*Jasus edwardsii*) puerulus have been collected by fishermen, possibly indicating an important settlement area (Shaw). There are small dune systems supporting pingao (*Desmoschoenus spitalis*) (a rare sand sedge) at North Port and Welcome Bay and the venerable sand plant sand spurge (*Euphorbia glauca*) at Sealers Bay (Chalky Island) (Johnson, 1979). Breeding Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*), broad-billed prions (*Pachyptila vittata vittata*) and sooty shearwaters (*Puffinus griseus*) have been recorded on a large number of the islands within Chalky Inlet. Reef heron (*Egretta sacra sacra*) (threatened) have been recorded on Small Craft Harbour and Passage Islands. S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), NZ falcon (*Falco novaeseelandiae*) and S.I. brown kiwi (*Apteryx australis australis*) (both threatened) have been recorded in various areas of coastal forest in this site (Morrison).

A large NZ fur seal (*Arctocephalus forsteri*) rookery occurs on the north west end of Chalky Island (1100-1875 individuals estimated in 1973), and a smaller haulout area is at Gulches Head (Wilson, 1981).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern fiords).

The overview of Fiordland's cultural values details the Maori legend of how Tu created the fiords, including Chalky. Tuhawaiki referred to Chalky Inlet as Taiari. There are many Maori names known for parts of the inlet (Beattie, 1949). Several are associated with the legend of Tu, others with the visit of the Takitimu

canoe, under Tamatea, and still others associated with Maui's visit. One of the overland routes used by the Maori in Fiordland was from Chalky Inlet to Dusky Sound. Chalky was well known to the early Maori who occupied many sea caves during seasonal visits to the fiord.

There are a large number of historic and archaeological sites known around the entrances to Chalky and Preservation Inlets. Unlike some of the sites further north, many prehistoric Maori midden sites in this area have remained largely undisturbed. Of particular importance : there are large caves with middens at Round Island and Southport containing artefacts showing evidence of early Maori occupation.

Also at Southport there are the foundations, hut site and several artefacts relating to the McCallum's Sawmill, which was built in 1901 and milled local timber within the vicinity until the area was protected by the formation of Fiordland National Park in 1907. About 1900 a number of industries started up in Chalky; including sawmilling and fish freezing at North Port; all were short-lived. There are caves also near the same area that show evidence of early European sealers occupation (McGovern-Wilson, 1985). Sealers decimated the fur seals here in the early 1800s. The naturalist Andreas Reischeck built a hut at Fisherman Bay in 1887 from where he explored and captured birds.

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990); and as part of Fiordland National Park, part of an area nominated for a World Heritage site, this site is also of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cd

Seventeen weed species including fox gloves (*Digitalis purpurea*) have been recorded by Johnson (1979) at Southport and marram grass (*Ammophila arenaria*) has been recorded on the beach at Sealers Bay on Chalky Island. Johnson also recorded heavy deer browsing in the Southport area (Johnson, 1979).

Human Modification and Human Use: dk

There are at least 6 well-known anchorage sites in Chalky used mostly by local fishermen; most notably are North Port and at Small Craft Harbour Islands (Ward, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing pressure is heavy at the mouth of Chalky Inlet (Voller, 1988).

Existing Protection:

Type and Comment: ad

This site borders on Fiordland National Park, though this protection extends only to the mean high watermark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	<u>1</u>	<u>2</u>	3	2 Limited information (general).
Threats	<u>1</u>	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	<u>7</u>	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	<u>7</u>	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	<u>7</u>	3 Derived from existing maps and photographs.
Threats	<u>1</u>	2	3	4	5	6	<u>7</u>	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	<u>1</u>	2	3	4	5	<u>6</u>	<u>7</u>	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - 3 PNA Preservation Ecol. Dis. 1904 National Park
 - 4 Geopreservation
 - 5 HPT County Inventories
 - 6 Other
 - 7 None
-

Other Considerations:**References**

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. DSIR Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau and Pers. comm. (C/- P.O., MacAndrew Bay, Dunedin).
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8. Voller, R.W. 1983. Fisheries Southland Regional Planning Scheme Sect. 3 (included in the background papers).
9. Dept. of Lands and Survey, 1986. The Story of Fiordland National Park.
10. Wilson, G.T. 1981. Distribution and abundance of the New Zealand fur seal (*Arctocephalus forsteri*), Fisheries Research Div. Occ. publ. 20.
11. Beattie, H. 1949. The Maoris and Fiordland.
12. Wells, S.M. International Union for Conservation of Nature and Natural Resources, Red Data Book for invertebrates.
13. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage list, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Outer coast from Fannin Bay to Chalky Inlet

Site No: 140051

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20010 54580

Date: 30 03 90

Brief Description of Site:

This is a long stretch of coast and continental shelf extending over 20km from the southern entrance of Dusky Sound to Cape Providence at the northern entrance of Chalky Inlet. It is characterised by exposed rocky shores, the main rock type being gneiss walls with occasional outcrops of coarse crystalline rock and uncemented alluvial gravels at the river mouths and lower valleys. The longshore drift and current offshore is generally in a southerly direction here. The continental shelf extends to approximately 5km offshore. Above the shore to the bushline - beech forest dominates, but mixed shrub eg. *Fuchsia*, *Olearia* and broadleaf fringes the coast. There are small patches of lowland podocarps/hardwoods in the floor of the valleys. These seaward coasts are diversified by ancient marine cliffed benches and flats, most related to Pleistocene highsea levels.

Conservation Values: Natural: abcde

Cultural: abcd

Historic: abc

Comment:

This is an area with a high degree of naturalness.

NZ falcon (*Falco novaeseelandiae* - threatened), S.I. kaka (*Nestor meridionalis meridionalis*) - regionally rare) and S.I. brown kiwi (*Apteryx australis australis* - threatened) have been recorded throughout the coastal forest from West Cape to Landing Bay, Chalky Inlet. Also along this coast numerous small NZ fur seal (*Arctocephalus forsteri*) haulouts occur on the rocky outcrops and breeding Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded at various sites (Morrison; Wilson, 1981).

West Cape has been recorded as the southern limit of the climbing rata - *Metrosideros fulgens*, pingao (*Desmoschoenus spiralis* - a rare sand sedge) and shore spurge (*Euphorbia glauca* - a venerable dune plant) have been recorded on the beach at Landing Bay (Morrison). The four km of coastal platform around Cape Providence contain an important biostratigraphic section through lower Ordovician graptolite bearing rocks (Geopreservation). This area is also noted for its scenic geological appeal (Morrison; Wood, 1960).

As with most of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the Outer coast of the northern fiords).

North of Cape Providence, a boat harbour was known to the Maoris as Rewa (floating), possibly Landing Bay. West Cape was named by Captain Cook, but the Maori name for the cape and the nearest creek to it on the north was Wai-tuna (eel stream) (Beattie, 1949).

This site has a number of very important archaeological / historic sites including Gronos Cave north of Cape Providence, at which a large cache of seal skins and of other sealers artefacts have been found, as well as evidence of prehistoric Maori occupation. At Landing Bay there is a large cave complex with midden and drawings (Maori and historic) (McGovern-Wilson, 1985; Hall Jones, 1976).

Site Importance: International National Regional Local Unknown

Comment:

As part of Fiordland National Park which is part of a nomination for World Heritage status and because of its high natural values this site merits international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cdi

A reasonably large patch of gorse (*Ulex europaeus*) has been recorded and controlled about half way between West Cape and Cape Providence (Shaw). This is the only documented existing threat for this area. Introduced animals occur along the coastline include pigs and deer (Shaw).

There have been reports from fishermen of bull kelp (*Durvillea antarctica*) becoming less widespread along the Fiordland coast in recent years. Concern exists about local overfishing of paua stocks (Hayes - pers. obs.)

Human Modification and Human Use: k

This is a rugged and exposed section of coast, and although many areas are passable by foot it is rarely visited. Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the length of this site (Voller, 1983).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is not permitted in the Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	<u>1</u>	2	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	2	<u>3</u>	

Comment:

With the exception of historic/archaeological sites there is little detailed information available on this site, including a paucity about either the intertidal or underwater ecology of the outer coast.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	<u>7</u>	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	<u>7</u>	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	<u>7</u>	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	<u>7</u>	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	<u>1</u>	2	3	4	5	<u>6</u>	<u>7</u>	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases:

Comment:

- 1 WERI
- 2 SSWI
- 3 PNA Doubtful Ecol. Dis. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:

References

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers.comm. (C/- P.O., MacAndrew Bay, Dunedin).
2. Wilson, G.J. 1981. Distribution and abundance of the NZ fur seal (*Arctocephalus forsteri*), Fisheries research Div. Occ. publ. 20.
3. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historical and archaeological sites, Dept. of Lands and Survey, Invercargill.
4. Voller, R.W. 1983. Fisheries Southland Regional Planning Scheme Sect. 3, (included in the background papers).
5. Beattie; Herries, 1949. The Maoris and Fiordland.
6. Hall Jones; John. 1976. Fiordland Explored, an illustrated history.
7. Wood, B.L. 1960. Geological map of New Zealand.
8. Shaw, L. Pers comm, D.O.C. Te Anau.
9. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Dusky Sound

Site No: 140052

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (Sht 16) 20220 54750

Date: 28 03 90

Brief Description of Site:

As with all the fiords, Dusky Sound is characterised by a glacially formed 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance formed by a moranic / rock sill. The fiords south of Breaksea and Wet Jacket Arm (including Dusky) are noticeably less precipitous than those of the north and are generally wider with numerous islets and islands especially at their entrances. Dusky Sound is 44km long making it the longest of any of the fiords. It covers an area of 181sq km, and has a maximum depth of 317m. Gneiss walls are the main rock type on the northern side of the sound and gneiss/schist walls on the southern side with uncemented alluvial gravels in the valleys and river mouths and fiord head. The main vegetation type is beech forest with occasional podocarp / hardwoods at the fiord head and on the coastal fringe. The hydrology within the sheltered fiord waters is estuarine with a large freshwater runoff on the surface and a very slow deep sea water circulation underneath.

Conservation Values: Natural: abcdgh

Cultural: abcd

Historic: abcde

Comment:

This is a remote area with a high degree of naturalness. The subtidal communities living on the fiord walls are unique in NZ and consist almost entirely of sessile suspension feeders in the depths between 5 and 40m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities and their dependence on the terrestrial surroundings is of international scientific interest (Grange, 1990).

S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), S.I. brown kiwi (*Apteryx australis australis*) and NZ falcon (*Falco novaeseelandiae*) both threatened species, have been recorded in coastal forest in various areas within this site; notably the head of the fiord, Cooper Island, Fanny Bay, Long Island and various islands at the entrance of the fiord. Richard Henry's bird transferral work at the turn of the century may be responsible for the presence of brown kiwi on these islands. There is a large estuary at the head of Supper Cove that supports many waterfowl including paradise shelduck (*Tadorna variegata*), mallard (*Anas platyrhynchos platyrhynchos*), scaup (*Aythya novaseelandiae* - breeding), black swan (*Cygnus atratus* - breeding), pied shag (*Phalacrocorax varius varius*) and blue duck (*Hymenolaimus malacorhynchos* - threatened) and brown teal (*Anas aucklandica chlorotis* - endangered) have been recorded in the lower Seaforth River mouth. Brown teal have also been recorded off the south west end of Anchor Island (Morrison).

Dusky Sound is also a haven for a number of seabird species. Sooty shearwaters (*Puffinus griseus*) have been recorded on small stacks off the end of Fiver Fingers Peninsula, and on a large number of small islands just inside the entrance to Dusky Sound. Broad-billed prions (*Pachyptila vittata vittata*) and breeding Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded in similar locations within the fiord. Mottled petrels (*Pterodroma inexpectata*) have been recorded breeding on Front and Shag Islands and an islet off the south west end of Cooper Island. Southern blue penguin (*Eudyptila minor minor*) have been recorded on Front Island (breeding). The threatened reef heron (*Egretta sacra sacra*) has been recorded on Big Petrel, Many and Inner Seal Islands at the fiord entrance (Morrison). Fiordland skinks (*Leiolopisma acrinasum*) have been recorded on a number of smaller islets and stacks

around the Dusky Sound entrance. Just north east of Fannin Bay has been the southern most limit known for Fiordland skinks to date (Thomas, 1986).

NZ fur seal (*Arctocephalus forsteri*) haulouts occur around the Outer Seal Islands (Wilson, 1981) and great skua (*Stercorarius skua lonnbergi*) are known to breed on an islet near here (Morrison). Inanga (*Galaxias maculatus*), banded (*Galaxias fasciatus*) and giant kokopu (*Galaxias argenteus* - indeterminate status), koara (*Galaxias brevipinnis*), red-finned bully (*Gobiomorphus huttoni*), and long finned eels (*Anguilla dieffenbachii*) have been recorded in various tributaries throughout this site (Morrison).

Lake Forster just above Crayfish Island has been recorded as the southern limit for *Myriophyllum robustum* in 1979 (Johnson, 1979).

As with all Fiordland this area has high aesthetic and landscape value (see site record sheet for the Outer coast of the northern fiords).

Dusky Sound - Tamatea to the Maoris - was named after the great chief of the Takitimu which visited here around 1350AD; six small islands at the mouth are named for other Tamatea's on board. Many Maori names for localities in the fiord are known; this probably reflects the amount of usage Dusky received historically. The Maori legend of the creation of the fiords by the god Tu is detailed in the overview of cultural values (Beattie, 1949).

Historically Dusky Sound is rich with both early European and Maori sites of occupation in the area. Some notable European sites include Luncheon Cove where the first house and boat were built in NZ by Europeans (1792-93); Astronomer Point is where Captain Cook moored the 'Resolution' in 1773. The remains of the stumps are left where the area was cleared of trees to enable precise astronomical observations to be made. There are a number of very large Maori midden sites that are considered archaeologically important, notably on the islands within the sound.

The wreck of the 'Waikere' - a steamer that struck a rock in Dusky Sound in 1910 and sank off Stop Island - remains in the area today (McGovern-Wilson, 1985).

Site Importance:	<u>International</u>	National	Regional	Local	Unknown
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Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990). As part of the nomination of South West N.Z. as a World Heritage Site this area is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cdj

One small patch of gorse (*Ulex europaeus*) has been recorded on the western end of Cooper Island and this is being controlled. The presence of deer does not appear to have been documented for this fiord. However, the occasional hunting parties visiting the area would suggest deer are present at least in the lower valleys. Pigs have also been recorded at Cascade Cove (Shaw).

Allocated rubbish and fuel dumps for fishermens waste are located at Anchor Island and Cascade Cove at the fiord mouth (Shaw). Some dump sites also occur on the Many Islands.

Human Modification and Human Use: dhki

There are approximately 15 anchorage sites in this fiord reflecting the large number of fishing vessels in the area. Most notable anchorages are at Anchor Island, Duck and Goose Coves, Crayfish Island and Cascade Cove (Ward). Commercial rock lobster fishing pressure is heavy at the entrance to the fiord (Voller, 1983). Supper Cove marks the end of the Dusky Sound Track from Lake Manapouri. The area is utilised by trampers - including recreational fishing at the mouth of the Seaforth River. Pickersgill Harbour and Astronomers Point are frequently visited historic sites in the area by tourists on charter vessels.

Existing Protection:

Type and Comment: a d

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark. Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries Regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	<u>1</u>	<u>2</u>	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	<u>7</u>	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	<u>7</u>	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	<u>7</u>	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	<u>7</u>	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	<u>7</u>	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

This area has been surveyed for coastal archaeological / historical sites (McGovern-Wilson, 1985).

Recorded on Existing Databases:**Comment:**

The Wetlands at the head of Dusky Sound and at Goose Cove could merit inclusion in WERI and/or Wetlands nationally important to fisheries database. Further investigative work to warrant this would have to be done.

- 1 WERI
- 2 SSWI
- 3 PNA - Doubtful Ecol. Dis. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**References**

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. div. DSIR Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, Te Anau DOC and pers. comm.(C/- P.O., MacAndrew Bay, Dunedin).
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4. Grange, K.R. 1990. Unique marine habitats in the N.Z. fiords : A case for preservation, Report prepared for DOC, NZOI, DSIR, Wellington.
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10. Thomas, B.W. 1986. Distribution and ecology of the Fiordland skink (*Leiopisma acrinasum*), Draft copy on File - DOC Te Anau.
11. Gillies, K. C/- Southland Museum, Invercargill. Pers. comm.
12. DOC, 1989. Nomination of South West N.Z. for inclusion in the World Heritage List, Govt. Printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Outer Coast, Breaksea Sound to Fannin Bay

Site No: 140053

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20050 54850

Date: 02 04 90

Brief Description of Site:

This site covers the outer coast and area of continental shelf from the northern entrance to Breaksea South, south to Dusky Sound. The coastline is characterised by high coastal hills and mountains with exposed rock and rock platforms extending into the fiords as far as the sill edge. The site extends out to the continental slopes including the terraces of the fiord entrances and shelf furrows. In the absence of any appreciable shelf it is delineated by the 200m contour. The coastline of the Breaksea Group of Islands, and Resolution Island and Five Fingers Peninsula has been described in those site records (14055 and 14054 respectively), so this site comprises of principally subtidal areas.

Conservation Values:

Natural: ac

Cultural: bcd

Historic:

Comment:

This is an area with a high degree of naturalness, and high landscape / seascape values. Little is recorded of the ecology of this area. Marine birds are abundant here and breed along the coastline especially on the islands and stacks. These include gulls, terns, petrels, Fiordland crested (*Eudyptes pachyrhynchus pachyrhynchus*) and little blue penguins (*Eudyptela minor minor*) and shags. These and marine mammals including fur seals (*Arctocephalus forsteri*), whale species - sperm (*Physeter catodon*), humpback (*Megaptera novaengliae*), orca (*Orcinus orca*) and southern right (*Balaera glacialis australis*) whales, and dolphins feed along the coast. Stocks of crayfish (*Jasus edwardsii*) and paua (*Haliotis iris*) occur in this area.

Fiordland skinks - *Leiopisma acrinasum* - occur on a number of small rat-free islands and stacks around the entrance to Breaksea and Dusky Sounds (these probably merit a recognised conservation status - Geoff Patterson - pers. comm.).

There are seal rookeries near Oliver Point in the north and on a stack off Five Fingers Peninsula (as well as the sites included in 14054 and 14055) (Wilson, 1981).

Site Importance:

International

National

Regional

Local

Unknown

Comment:

As part of Fiordland National Park (included in the nomination of South West New Zealand as a World Heritage site), and because of its high natural values this site is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: m

There have been reports from fishermen of bull kelp (*Durvillea antarctica*) being less widespread along the Fiordland coast in recent years. Concern exists about local overfishing of paua (*Haliotis iris*) stocks (Hare - pers. obs.)

Human Modification and Human Use: k

This area is used commercially by crayfishermen and paua divers.

Existing Protection:

Type and Comment: None.

Availability of Information:

Natural	1	2	3	
Cultural	1	2	3	1 Well documented.
Historic	1	2	3	2 Limited information (general).
Threats	1	2	3	3 Little information (if any).
Human Mod. & Use	1	2	3	

Comment:

This is a paucity of information on the intertidal and subtidal ecology of this outer coastline and continental shelf area.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
 - 2 SSWI
 - 3 PNA
 - 4 Geopreservation
 - 5 HPT County Inventories
 - 6 Other
 - 7 None
-

Other Considerations:**References**

1. Coastal and Marine Ecological Districts of New Zealand; Dept. of Lands and Survey 1985.
2. Ecological Regions and Districts of New Zealand, Sheet 4; edited by Mary McEwen, DOC 1987.
3. Wilson, G.T. 1981. Distribution and abundance of the New Zealand fur seal (*Arctocephalus forsteri*). Fisheries Research Div., Occ. Pub. 20.
4. Patterson, G. Pers. comm. Wellington D.O.C.
5. D.O.C., 1989. Nomination of South West New Zealand for inclusion in the World Heritage List: Govt Printer. Wellington.

Accompanying Maps and Photographs:

Site Names: Resolution Island

Site No: 140054

Recorders Name: S Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (Sht 16) 20130 54850

Date: 28 03 90

Brief Description of Site:

Resolution Island, the largest island in Fiordland, covers an area of 222ha and dominates the entrance to Dusky Sound. The height of the highest peak is 1070m. The main bed rock of the island is gneiss with occasional schist and marble outcrops (notably on the western shores). The vegetation is composed mainly of beech forest with some stunted hardwood (rata, kamahi) areas on the more exposed western side. The site also includes the Five Fingers Peninsula, which is composed principally of out wash gravels and moraines from the Last Glaciation.

The island is roughly circular except that along the western seaward edge runs the long Five Fingers Peninsula; this is joined to Resolution Island only by a narrow strip of land. Resolution Island was managed as a bird sanctuary by Richard Henry from 1894 and abandoned when stoats reached the island.

Conservation Values:

Natural: abcg

Cultural: abc

Historic: abcd

Comment:

This is a remote and highly natural area.

There is a large island population of S.I. brown kiwi (*Apteryx australis australis* - threatened) on Resolution Island. Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded breeding on the south side of Resolution Island (near Fixed Head). Broad-billed prions (*Pachyptila vittata vittata*) have been recorded on small stacks off the end of Five Fingers Peninsula. In the same area sooty shearwaters (*Puffinus griseus*) have been recorded, as well as a large NZ fur seal (*Arctocephalus forsteri*) rookery. Inanga (*Galaxias gracilis*), banded and giant kokopu (*Galaxias argenteus* - rare), koaro (*Galaxias brevipinnis*), red finned bully (*Gobiomorphus huttoni*) and long finned eels (*Anguilla dieffenbachii*) have been recorded in various tributaries throughout this site (Morrison). In Goose cove there is an area where four different brachiopods live together - *Terebratella sanguinea*, *T. inconspicua*, *Notosaria nigricans* and *Liothyrella neozelandica* within diving depths (Grange).

At Disappointment Cove (on the north side of Resolution Island) pingao (*Desmoschoneus spiralis* - a rare sand sedge) has been recorded in occasional clumps on the small area of sand at the eastern end of the bay. This is also the southern limit of the plant *Pteris macilenta* (Johnson, 1979). S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare) and NZ falcon (*Falco novaeseelandiae* - threatened) have been recorded in surrounding coastal forest of the cove (Morrison).

In coastal forest on the south western end of Five Fingers Peninsula a unique species of native land snail has been recorded - *Powelliphanta fiordlandica* (Morrison). Kiekie (*Freycinetia banksii*) occurs here at its southern limit (Johnson, 1979). This is also the sight of the endemic knobby weevil (*Hamadramphus stilbocarpa*) recorded in only five sites on rock stacks off shore of the Five Fingers Peninsula (Thomas).

A small area of ancient marine shelly sands (pleiocene) occurs on the eastern coast of Five Fingers Peninsula.

As with the rest of Fiordland this area has high aesthetic and landscape values (see outer coasts of the

northern fiords record sheet).

This area holds special significance for Maoris (see overview of Fiordland's cultural values). Names of localities on Five Fingers Peninsula are bound up with a woman of the Lost Tribe, and also Te Puta, a Waitaha tribe member. The peninsula is known as Taumoana, and Resolution Island as Ka-tu-wae-wae-o-Tu, the standing feet of Tu as it was on here Tu stood when he created the fiords.

This area is rich with early European history. Facile Harbour was the site of NZ's first shipwreck (European) in 1795, the Endeavour. This site and artefacts recovered from it (2 large cannons - now on public display) are nationally important. There are a number of old sealers camps on the south western side of the island as well. Richard Henry became the caretaker of Resolution Island in 1894, and living on Pigeon Island (also an historic site) transferred over 700 brown kiwi (*Apteryx australis australis*), little spotted kiwi (*Apteryx owenii*), kakapo (*Strigops habroptilus*) and weka (*Gallirallus spp.*) to Resolution and other islands at the entrance to Dusky Sound, during the first seven years of living there.

A number of archaeological sites indicating early Maori occupation have been recorded around the shores of Resolution Island (McGovern-Wilson, 1985) consisting mostly of cave occupation sites and middens.

Site Importance: International National Regional Local Unknown

Comment:

The largely unmodified nature of the vegetation, and the fact that this site is within Fiordland National Park merits this sites part of an area nominated for a World Heritage site) inclusion as nationally important (D.O.C., 1989).

Existing Threats:

Type and Comment: cdm

Johnson (1979) recorded gorse and 6 other weed species at Disappointment Cove. Gorse (*Ulex europaeus*) plants have also been found at Woodhen Cove. Johnson also recorded heavy deer browsing at the cove, which would suggest there are large numbers of deer on the island. Their presence modifies the protective coastal scrub. The entire western coast of Five Fingers Peninsula and Woodhen and Goose coves seem to collect large amounts of washed up pollution, notably fishing gear (Shaw).

Human Modification and Human Use: dkh

There are a large number of anchorage sites especially the south western side of Resolution Island which are used frequently by the large number of fishing vessels in the area (Ward, 1983). Commercial rock lobster fishing is present throughout the entrances to the fiords and on the outer coast (Voller, 1983).

A number of tourist vessels visit Pigeon Island for its historical significance i.e. the historic house site that belonged to Richard Henry.

Existing Protection:

Type and Comment: ad

This site is part of Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	<u>3</u>	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Recorded on Existing Databases: Comment:

1	WERI
2	SSWI
<u>3</u>	<u>PNA Doubtful Ecol. Dis. 1904 National Park</u>
4	Geopreservation
5	HPT County Inventories
6	Other
7	None

Other Considerations:**References**

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. DSIR Dunedin.

2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- MacAndrew Bay, Dunedin).
3. Grange, K.R. Pers. comm. C/ Div. Mar. & Fr. Water Science, DSIR Wellington.
4. Shaw, L. DOC Te Anau, Pers. comm.
5. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites Dept. of Lands and Survey Invercargill.
6. Ward, J.; Shaw, L. 1983. Fiordland Coastal Anchorages. D.O.C. Te Anau.
7. Voller, R.W. 1983. Fisheries - Southland Regional Planning Scheme Sect. 3 (included in the background papers).
8. Thomas, B.W. pers. com. C/- Ecol Div. D.S.I.R. Nelson.
9. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
10. Beattie, H. 1949. The Maoris and Fiordland.

Accompanying Maps and Photographs:

Site Names: Breaksea, Gilbert and Entry Islands

Site No: 140055

Recorders Name: S Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20150 54950

Date: 23 03 90

Brief Description of Site:

This group of islands is located at the entrance of Breaksea Sound, in between the northern side of the entrance and Resolution Island. This site incorporates many smaller islets : the Inner and Outer Gilberts, Wairaki and Hawea. The islands are all highly exposed to strong prevailing westerly winds. Breaksea Island (170 ha in area) is especially isolated from the mainland by strong currents both north and south of the island possibly making it difficult for mainland introduced mammals to have become established on the island by their own means. The rocky coastlines are largely steep schist/gneiss walls. Occasional outcropping of marble occur on these islands. The vegetation is dominated by stunted mixed scrub associations; there is some mixed rata/kamahi/beechn forest on the south west of Breaksea Island.

Conservation Values:

Natural: abcdgh Cultural: bcd

Historic:

Comment:

This is a remote and highly natural area with high aesthetic and landscape values.

Breaksea Island is recognised as a nationally important area due to it being included as an island of rodent-free status recently after a major operation to eradicate introduced rats from the island in 1989. The surrounding islands Wairaki and Hawea are also rodent-free. Breaksea Island will probably be used for endangered species transferred in the near future. It is a significant coastal breeding area for Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*), sooty shearwaters (*Puffinus griseus*), southern blue penguins (*Eudyptella minor minor*), southern great skuas (*Stercorarius skua lonnbergi*), and a large population of S.I. robins (*Petroica australis australis*) (Breaksea was the only island population of these in Fiordland until recent liberations on Hawea and Entry Islands). Broad-billed prions (*Pachyptila vittata vittata* - breeding) also occur on Hawea, Wairaki and a small islet off the south west end of the Gilbert Islands. Sooty shearwaters (breeding) are recorded on the southern tip of Hawea Island and on the Gilbert and Entry Islands. Fiordland crested penguins (breeding) are also recorded on Entry and Hawea Island.

Southern blue penguins have been recorded breeding on the southern end of Hawea Island. N.Z falcon (*Falco novaeseelandiae* - threatened) has been recorded on Hawea Island and parakeet (*Cyanoramphus auriceps auriceps*) and S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare) have been recorded in coastal forest on the Inner Gilbert Islands (Morrison).

Fiordland skinks (*Leiopisma acrinasum*) have been recorded on the Outer Gilbert Islands, Wairaki Island, and a small rock stack off the south west of Breaksea Island (Thomas, 1986). N.Z fur seals (*Arctocephalus forsteri*) haulout in various spots around Breaksea and Wairaki Islands (Wilson, 1981).

Breaksea Islands' vegetation remains largely unmodified. A somewhat unique assemblage of coastal plants including *Anisotome lyallii* occurs on the eastern side of the island - this is a remnant assemblage that has been preserved in the absence of browsers (Rance).

Breaksea Island is recorded as the northern limit for the plant *Luzula banksiana* var. *acra* in 1979 (Johnson, 1979).

There are no known historical sites or archaeological sites in this area. Captain Cook (1773) records "The outermost of the islands I have called Breaksea Isle, because it effectually covers this entrance from the violence of the S.W swell".

The Maori name for Breaksea Island is Ka-Huruhuro-o-koekoea, associated with the long-tail cuckoo. The Maori legend of the making of the fiord is detailed on the overview of Fiordland's cultural values. As a highly natural area, these islands have important landscape values (Beattie, 1949).

Site Importance: International National Regional Local Unknown

Comment:

These island's high degree of naturalness, especially the unmodified vegetation in the absence of browsers, and the importance of retaining rodent-free islands such as these for future endangered species transferral, would merit their inclusion in at least national importance. The fact that this is part of the South West New Zealand World Heritage nomination gives this site international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: d

Given the high profile of Breaksea Island since the success of the rat eradication programme, there will be several return field trips to monitor any possible reinfestation of rats. Possibly the biggest threat to the site would be through people inadvertently transferring rodents by vessel to the islands (Thomas).

Human Modification and Human Use: k

Commercial rock lobster (*Jasus edwardsii*) fishing is present throughout the entrances to the fiords and on the outer coast (Voller, 1983). Access to Breaksea Island is difficult by boat due to the exposed nature of the islands location, therefore human modification has been slight. Several contour tracks were cut around the island to facilitate access to bait stations during the rat eradication. With the final stages of the programme being completed these tracks will be left to return to the natural vegetation cover.

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection only extends to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries Regulations.

Availability of Information:

Natural	<u>1</u>	<u>2</u>	<u>3</u>	
Cultural	<u>1</u>	<u>2</u>	<u>3</u>	1 Well documented.
Historic	<u>1</u>	<u>2</u>	<u>3</u>	2 Limited information (general).
Threats	<u>1</u>	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	<u>1</u>	<u>2</u>	<u>3</u>	

Comment:

There is a paucity of scientific information on the subtidal ecology of this site; possibly due to the exposed nature of the coastline around the islands, making diving difficult.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	<u>7</u>	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	<u>7</u>	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	<u>7</u>	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	<u>7</u>	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	1	2	3	4	5	<u>6</u>	<u>7</u>	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases:**Comment:** May be on some local 'Islands' databases?

- 1 WERI
- 2 SSWI
- 3 PNA Doubtful Ecol. Dis. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**References**

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. DSIR Dunedin.
2. Morrison, K R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
3. Wilson, G. T. 1981. Distribution and abundance of the NZ fur seal (*Arctocephalus forsteri*), Fisheries Research Div. (Occ. Publ. 20).
4. Thomas, B.W. 1986. Distribution and ecology of the Fiordland Skink (*Leiopisma acrinasum* Hardy). Draft copy on file FNP 26/2, Vol. VI, DOC Te Anau.
5. Rance, B. DOC Invercargill, pers. comm.
6. Voller, R.W. 1983. Fisheries. Southland Regional Planning
7. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List. Govt. printer, Wellington.
8. Beattie, H. 1949. The Maoris and Fiordland.
9. Thomas, B.W. Ecol. Div. D.S.I.R. Nelson (Pers. Com.)

Accompanying Maps and Photographs:

Site names: Breaksea Sound/Wet Jacket Arm

Site No: 140056

Recorders Name: S Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 16) 20220 54890

Date: 28 03 90

Brief Description of Site:

As with all the fiords, Breaksea Sound and Wet Jacket Arm are characterised by glacially formed classic 'U' shapes with steep sea cliffs and basins behind a shallow entrance formed by a morainic / rock sill. Breaksea Sound is 33km in length, covering an area of about 62km sq. with a maximum depth of 365m. Wet Jacket Arm is 20km in length, covering an area of 19.1sq km with a maximum depth of 284m. The main bedrock of these fiords is steep gneiss / schist walls with uncemented alluvial gravels at the fiord heads. The main vegetation type surrounding the fiords is beech forest with occasional podocarps / hardwoods in the coastal fringe and at the fiord heads. This site also includes the Acheron Passage on the eastern side of Resolution Island. The hydrology within the fiords waters is estuarine with a large freshwater runoff on the surface and very slow deep sea water circulation underneath.

Conservation Values:**Natural:** abc**Cultural:** bcd**Historic:** abc**Comment:**

This is a remote area with a high degree of naturalness. The subtidal communities living on the fiord walls are unique in NZ and consist almost entirely of sessile suspension feeders in the depths between 5 and 40m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis*) (listed as internationally threatened in IUCN - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependence on terrestrial surroundings is of international scientific interest (Grange, 1990). At the head of Broughton Arm, Breaksea Sound there are large numbers of resident squid (*Notododarus spp.*) and opal fish (*Hemerocoetes monopterygius*) recorded in shallow depths (Shaw) (These are usually species found at great depth). At Second Cove in Breaksea Sound there is a large number of young black coral (*Antipathes fiordensis* - listed as internationally threatened in IUCN - Wells) colonies recorded; possibly an important nursery with high planulae settlement (Grange).

S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), S.I. brown kiwi (*Apteryx australis australis*) and NZ falcon (*Falco novaeseelandiae*) (both threatened species) have been recorded in coastal forest throughout this site and including some of the small islands within these fiords. Fjordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded on small islets off Chatham Point (Vancouver Arm) and just north of the John Islands (breeding) (Morrison).

At the head of Wet Jacket Arm, yellowhead (*Mohoua ochrocephala*) (threatened) have been recorded in coastal forest. Moose (liberated in 1909 at Dusky Sound) were recorded here during the 1950's. Between Oke Island and the northern side of Wet Jacket Arm - schooling groper *Polypriion oxygeneios* often occur within 40m of water in relative abundance (Shaw). An undescribed feather star occurs on the southern side of the entrance to Wet Jacket Arm. Also in this area resident sweep (*Scorpius aequipinnus*) have been recorded here - an uncommon fish species in the S.I. (Grange).

Brown teal (*Anas aucklandica chlorotis*) (endangered) have been recorded at Lake Herrick near the mouth of Herrick Creek in Wet Jacket Arm (Morrison). Breeding broad-billed prions (*Pachyptila vittata vittata*) have been recorded on Oliver Point at the northern entrance to Breaksea Sound

(Morrison).

As with the rest of Fiordland, these fiords have high aesthetic and landscape values (see Outer coasts of the northern fiords record sheet).

The Maori name for Acheron Passage is Te Ara-wai-a-te-rakihouia after the chief's son Te Rakihouia who explored the South Island by canoe over 1000 years ago. Breaksea Sound - Te Puaitaha - is named after an ancestor who lived there. Other Maori names are associated with the legend of the creation of Fiordland by the Maori god Tu (see cultural overview) and with weka, blue heron, also fur seal rookeries.

Stevens Island was known as one of two places in the sounds in which crayfish gathered in countless hordes, hence its name Huihui-koura.

There are a number of important historical and archaeological sites in these fiords. William Docherty was an early prospector in the area who left behind a number of campsites which now have historic value. There are 5 sites indicating early Maori occupation in this area (McGovern-Wilson, 1985).

Site Importance:	<u>International</u>	National	Regional	Local	Unknown
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Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990). Additionally, the fact that this area is part of the nomination of South West New Zealand as a World Heritage site, merits this sites inclusion as internationally important (D.O.C.. 1989).

Existing Threats:

Type and Comment: c

One small patch of gorse (*Ulex europaeus*) has been recorded and controlled on the southern end of the main Harbour Island in Breaksea Sound (Shaw). There are no other documented existing threats to these fiords.

Human Modification and Human Use: dk

There are three anchorages that receive frequent use in these fiords : at the southwest side to the entrance of Breaksea Sound, at Harbour Island (Breaksea Sound) and on the northern side of the entrance to Wet Jacket Arm (Ward, Shaw, 1983). Commercial rock lobster fishing is particularly heavy around the entrances to Breaksea and Dusky Sounds (Voller, 1983).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water marks.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

There is a little detailed information available on these fiords.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases: Comment:**

- 1 WERI
- 2 SSWI
- 3 PNA Doubtful Ecol. Dis. 1904. National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**References**

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC, and pers. comm. (C/- P.O., MacAndrew Bay, Dunedin).
2. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
3. Grange, K.R. Pers. comm. C/- Div. Mar. & Fr. Water Science, DSIR. Wellington.
4. Shaw, L. Pers. comm. DOC Te Anau.

5. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites. Dept. of Lands and Survey Invercargill.
6. Ward, J.; Shaw, L. 1983. Fiordland Coastal Anchorages. (Held in D.O.C. Te Anau).
7. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
8. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
9. Wells, S.M. Red data Book for Invertebrates, International Union of conservation for Nature and Natural Resources

Accompanying Maps and Photographs:

Site Names: Outer coast-Breaksea to Big Bay

Site No: 140057

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20570 55780

Date: 20 03 90

Brief Description of Site:

This area is a long stretch of outer coast extending over 140 km of the northern Fiordland. It is characterised largely by rocky exposed shores, occasionally interspersed with small sandy bays. The continental shelf extends to approximately 5 km offshore. The longshore drift and current offshore is generally in a southerly direction from Jackson Bay. The rocks of this coast are made up largely of steep schist/gneiss walls with occasional outcrops of marble; uncemented alluvial gravels occur at river mouths and the base of valleys. The vegetation is dominated by beech forest with occasional lowland podocarp (e.g. rimu)/hardwoods (e.g. rata, kamahi) in the valleys and behind beaches. The site does not include Martins or Big Bays or the entrances or the inner parts of the main northern fiords. Due to the limited accessibility and steep exposed nature of these shores only a few areas have been surveyed in any detail.

Conservation Values:**Natural:** abcdeg**Cultural:** bcd**Historic:** b**Comment:**

This is a highly natural area.

While much of this site is characterised by unsurveyed exposed rocky shores, several areas - notably the occasional sandy beaches-have been visited. Johnson (1979) found dune systems with pingao (*Desmoschoenus spiralis* - a rare sand sedge) cover at the Kaipō River mouth, Catseye Bay, and at Coal River. The lower valley floor of Catseye Bay is tidal forming a small estuarine area with salt marsh habitat for a number of waterfowl including white heron (*Egretta alba modesta* - threatened). At Yates Point reef heron (*Egretta sacra sacra* - threatened), S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), N.Z. falcon (*Falco novaeseelandiae* - threatened), parakeet (*Cyanoramphus auriceps auriceps*) and fernbird (*Bowdleria punctata punctata* - possibly breeding) have been observed in surrounding coastal forest. Large numbers of tui (*Prothemadera novaeseelandiae novaeseelandiae*) have been observed here feeding on coastal rata. Just south of Yates Point there are a number of small caves that are of geologically scenic interest. Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) are known to breed in the caves as well as out in amongst large open boulders on the shore and are present in high numbers - 493 individuals in 1986. An undescribed snail similar to *Powelliphanta hochstetteri lignaria* has been recorded in forest very close to the coast from this area. A large number of N.Z. fur seals (*Arctocephalus forsteri*) have been recorded on the rocky outcrops at Yates Point - 1295 individuals in 1986, making this site the fourth largest rookery on the Fiordland coast (Morrison). Other notable seal haulouts occur at the "Knobbies" (an uncharted rock north of Milford Sound), Looking Glass Bay, Two Thumb Bay, and the west side of Secretary Island (Wilson, 1981). Sooty shearwaters (*Puffinus griseus*) and broad billed prions (*Pachyptera vittata vittata*) have been recorded breeding on small islets just south of Dagg Sound (Morrison). Oil seeps recorded at Madagascar beach and the mouth of the Wolf River have been investigated by the N.Z. geological survey (Cook, 1988).

Coal River has a large dune system and due to its unmodified nature is considered to be one of the best dune systems in Fiordland as well as one of the most attractive (Cooper). Blue duck (*Hymenolaimus malacorhynchus*), S.I. kaka, and S.I. brown kiwi (*Apteryx australis australis*) (all threatened species) and giant kokopu (*Galaxias argenteus* - indeterminate status) have been recorded near or at the mouth of the Coal River (Morrison). On the boulder beach here Fiordland skink

(*Leiopisma acrinasum* - regionally threatened - Paterson) have been recorded at their only known mainland site, the rest of the population being restricted to approximately 30 islands and rock stacks off the coast north to Nancy Sound (Thomas, 1986).

Johnson (1979) records the mouth of the Kaipō River as the northern limit of the plant *Olearia oporina*; Catseye Bay as the southern limit for Climbing Rata (*Metrosideros perforata*); Yates Point as the southern limits for *Juncus caespiticus* and Broadleaf (*Griselinia lucida*) and the northern limit for *Carex pleiostachys*.

The only recorded archaeological sites along the outer coast are at the Coal River beach where a large Maori campsite, oven and some important artefacts have been described (McGovern-Wilson, 1985). In addition to the well known and distinctive aesthetic and landscape values of the Fiordland coast which also apply here, Fiordland as a whole holds significant spiritual value for both pakeha and Maori. The spiritual appeal of Fiordland and its coast is indefinable, suffice to say it is a place of solitude, retreat and quiet rejuvenation (ref. 6, 1986). Historically the Maori attributed the creation of Fiordland to the work of great sea gods (see Summary of the Maori values of Fiordland). Several sites along this outer coastline have traditional Maori names, some of which reflect their history or use e.g. Te Kaika-o-niho (Looking Glass Bay), the residence of a Westland chief Niho who retreated here after local slayings. Te Ahi-rakatira is a creek just south of Transit River, and was named after the burnt-out frame of a Maori canoe belonging to those murdered at Anita Bay by sealers, came ashore here. As many of the points along this coast are named, it would indicate the area was often visited by canoe. Early circumnavigations of the South Island were completed by Maui, by those on the canoe Takitimu (commanded by Tamatea-pokai-whenua) and by Te Rakihouia from the Nelson area (Beattie, 1949).

Site Importance: International National Regional Local Unknown

Comment:

The complex zoning of unmodified coastal vegetation from foredunes to mature forest growing on ancient dunes at the beach areas in this site is of considerable scientific value. Also, as part of Fiordland, this site is of international importance, since its inclusion in the South West New Zealand nomination as an area worthy of World Heritage status (D.O.C., 1989).

Existing Threats:

Type and Comment: c d

Up to 28 weed species including marram grass (*Ammophila arenaria*) and gorse (*Ulex europaeus*) have been recorded by Johnson (1979) from this site at Yates Point, Catseye Bay, Looking Glass and Two Thumb Bays, and Coal River. Johnson also recorded heavy deer browsing at the Kaipō River mouth, Yates Point, Looking Glass and Two Thumb Bays, and at Coal River. Medium deer browse was recorded at Catseye Bay and rabbits were only reported present at the Kaipō River mouth. These introduced mammals severely modify the protective coastal vegetation.

Human Modification and Human Use: d k

There are anchorage sites with medium usage at Catseye and Looking Glass Bays (Ward, Shaw, 1983). Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983). Being such a remote area there is little human modification to this site.

Existing Protection:**Type and Comment: ad**

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	1	Well documented.
Cultural	1	<u>2</u>	3	2	Limited information (general).
Historic	1	2	<u>3</u>	3	Little information (if any).
Threats	1	<u>2</u>	3		
Human Mod. & Use	1	<u>2</u>	3		

Comment:

There is little detailed information available on this site.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1. Derived info from existing lit. & databases
Cultural	<u>1</u>	2	3	4	5	6	7	2. Derived info as above & field check
Historic	<u>1</u>	2	3	4	5	6	7	3. Derived from existing maps & aerial photos
Threats	<u>1</u>	2	3	4	5	6	7	4. Recent DOC survey incl sampling & analysis
Human Mod. & Use	1	2	3	4	5	<u>6</u>	7	5. Recent DOC survey excl sampling & analysis
								6. Experience
								7. Expert advice

Comment:**Recorded on Existing Databases: Comment:**

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

It has been suggested the platform area above Yates Point was not affected by recent glaciation, and would warrant further investigation for unique species esp. invertebrates (Wilson, 1981). There is a lack of detailed information on subtidal ecology of the outer coast of fiordland.

References

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC. and pers. comm. (C/- P.O MacAndrew Bay, Dunedin).
3. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), Fisheries research Div. Occ. publ. 20.
4. Cooper, W.J. Areas of Ecological, Historical or Archaeological significance, App. 2, Published in Southland Regional Planning Scheme Sect. 3 (included in the background papers volume).
5. Cook, R. 1988. Madagascar Beach oil seep revisited, Geological Survey Report G114, N.Z. Geol. Survey, D.S.I.R, Lower Hutt.
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9. Ward, J.; Shaw, L. 1983. Fiordland Coastal Anchorages D.O.C. Te Anau.
10. Voller, R.W. 1983. Fisheries. Southland Reg. Planning Scheme. Sec. 3 (Included in background papers).
11. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
12. McGovern-Wilson, R. 1985. Fiordland National Park. Gazetteer of Historic and Archaeological Sites, Dept. Lands and Survey, Invercargill.
13. Paterson, G. D.O.C. Head Office, Wellington (Pers. Comm.)

Accompanying Maps and Photographs:

Site Names: Dagg Sound

Site No: 140058

Recorders Name: S Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20260 55160

Date: 02 03 90

Brief Description of Site:

As with all the fiords Dagg Sound is characterised by a glacially formed classic 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance. The upper reaches of the 13km fiord are divided into two arms, one of which ends only 1km from the head of Crooked Arm, Doubtful Sound. The hydrology within the sheltered fiord waters is estuarine with a large freshwater run off on the surface and a very slow deep water circulation underneath.

The fiord walls are primarily gneiss / schist; in the lower valleys and river mouths are uncemented alluvial gravels. The vegetation is mostly beech forest with mixed podocarp/hardwoods in the valleys and at the head of the fiords.

Conservation Values:

Natural: abdgh

Cultural: abcd

Historic:

Comment:

The subtidal communities living on the fiord walls are unique in New Zealand and consist almost entirely of sessile suspension feeders in the depths between 5 and 40m. The light-absorbing freshwater layer restricts algal growth and has allowed normally deepwater species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed as internationally threatened by the I.U.C.N. - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tubeworms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependence on the terrestrial surroundings is of international scientific interest (Grange 1990).

In this fiord the most northerly limit of orange-lined perch *Lepidoperca sp.* - a normally deep water Tasmanian fish - has been recorded in divable depths (Grange). Yellow head (*Mohoua ochrocephala* - threatened) and NZ falcon (*Falco novaeseelandiae* -threatened) have been recorded in coastal forest at the head of this fiord. Sooty shearwaters (*Puffinus griseus*) have been recorded breeding on small islets at Towing Head on the southern side of the entrance to Dagg Sound (Morrison). A rookery of fur seals (*Arctocephalus forsteri*) lay behind the islets (Beattie).

As with all the fiords, this is a highly natural area, with dramatic landscape features. For cultural values refer to the outer coast of the northern fiords sheet, and to the overview of Fiordland's cultural values; the creation of these fiords by the Maori god Tu is detailed there. There has been no detailed site surveying for historic or archaeological sites in Dagg Sound to date (Beattie, 1949).

The Maori name for Dagg Sound is Te Ra, so named because it lies better in the sunshine than most of the fiords (Beattie, 1949).

Site Importance:International

National

Regional

Local

Unknown

Comment:

The unique subtidal biological communities are of international scientific interest (Grange, 1990). As part of the South West New Zealand nomination for our World Heritage site this site is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: d

The extent and numbers of deer present is not documented. However, the fact that the area between the head of Dags Sound and the end of Crooked Arm, Doubtful Sound is frequently visited by hunting parties would suggest that deer are most likely present in the lower valleys. There are no documented existing threats for this fiord (Hayes - pers. obs.)

Human Modification and Human Use: dk

Two anchorages are commonly used by local fishing vessels within the fiord: Anchorage Arm (heavy usage), and Schooner Point (medium usage) (Ward, Shaw, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing is present throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by the West Coast fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	2	<u>3</u>	

Comment:

There is little detailed information available on this fiord, especially with regard to the historic/archaeological and underwater ecology values.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA Doubtful Ecol. Dis. 1904 National Park
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- 7 None

Other Considerations:**References**

- 1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers.comm. (C/- P.O.MacAndrew Bay, Dunedin).
- 2. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
- 3. Grange, K.R. Pers. comm. C/- Div. Mar. & Fr. Water Science, DSIR Wellington.
- 4. Ward, J.; Shaw, L. 1983. Fiordland Coastal Anchorages. D.O.C. Te Anau.
- 5. Voller, R.W. 1983. Fisheries, Southland Regional Council Planning Scheme Sect. 3 (included in background papers).
- 6. Beattie, H. 1949. The Maoris in Fiordland.
- 7. Wells, S.M. International Union for Conservation Nature and Natural resources, Red data book for Invertebrates.
- 8. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Doubtful Sound

Site No: 140059

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20430 55230

Date: 22 03 90

Brief Description of Site:

As with all the northern fiords Doubtful is characterised by a glacially formed classic 'U' shape with steep sea cliffs and several deep basins behind a shallow entrance formed by a morainic rock sill. The fiord is very long (40 kilometres) and winding. It covers an area of 84 sq. km and with a maximum depth of 421m, Doubtful is the deepest of all the fiords. There are 3 distinct arms on the southern side and the fiord culminates at Deep Cove. A large catchment enters Deep Cove from two sources: the Lyvia river and the tailrace from the underground power station on Lake Manapouri. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the fiord head and at the heads of Hall, Crooked and First Arms. Some areas around the head of the fiord and up to Hall Arm also incorporate metamorphic schists. The main vegetation type is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) in the valley behind the fiord head. There are some small saltmarsh areas at the mouth of the Lyvia River in Deep Cove.

Conservation Values:

Natural: abcdghi

Cultural: abcd

Historic: bc

Comment:

This is a remote and highly natural area.

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis*, listed by the IUCN as threatened internationally (Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependance on the terrestrial surroundings is of international scientific interest (Grange, 1990).

On the south west side of Secretary Island a brachiopod *Liothyrella neozelanica* reaches its known northern limit to diving depths (Grange). A unique assemblage of diverse subtidal biological communities (relative to other areas in Fiordland) occurs at The Gut (an area between Bauza and Secretary Islands) in divisible depths. These include 4 species of brachiopods: *Terebratella sanguinea*, *T. inconspiqua*, *Notosaria nigricans*, *L. neozelanica*, black coral, red and white hydro corals (Order Stylasterina) and sea pens (*Sarcophyllum bollonsi*) (Grange). Large numbers of female rock lobsters (*Jasus edwardsii*) in berry (egg) are often caught in the area between Bauza and Utah Islands (Shaw). On the northern side of Malaspina Reach there is a significant population of sea pens (*Sarcophyllum sp.*) within divisible depths. In the same area resident sweep (*Scorpius aequipinnus*) have been recorded - an uncommon fish species in the S.I. (Grange).

Fiordland skinks (*Leiopisma acrinasum*) have been recorded on Bauza Island, Hares Ears, Shelter Islands, Nee Islands and a rock stack just south of Febrero Point (Thomas, 1986). S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare) have been recorded in coastal forest on Bauza Island, and at the head of Deep Cove. S.I. brown kiwi (*Apteryx australis australis*) (threatened) are known to be present in coastal forest on the south side of Doubtful Sound from the entrance of the fiord to the head of First Arm, and at the head of Deep Cove. Blue duck (*Hymenolaimus malacorhynchus*) (threatened) have been recorded in the mouths of streams at the first bay of Crooked Arm, the head of Deep Cove, and the head of Hall Arm. N.Z. falcon (*Falco novaeseelandiae* - threatened) have been recorded around the head of Deep Cove

(Morrison).

There are a number of N.Z. fur seal (*Arctocephalus forsteri*) haulout areas in this site, most notably at the Nee Islands and adjacent coast (breeding), and at the Shelter Islands (Morrison). Seals often feed on trout in the tailrace at the head of the fiord. Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded on Utah Island (moulting), the Shelter, Matai, Elizabeth and Rolla Islands and just south of Rocky Point on the north west side of Secretary Island (breeding). Southern Blue penguins (*Eudyptela minor minor*) have been recorded on the second largest Shelter Island. Sooty shearwaters (*Puffinus griseus*) have been recorded breeding on the Shelter and Nee Islands. The first early record of giant kokopu (*Galaxias argenteus* - a rare freshwater fish) in Fiordland was reported from the river at the head of First Arm (Morrison). During periods of extreme cold and calm, small areas at the end of Hall and most of Crooked Arm are known to ice over (Shaw).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

A large Maori midden site is recorded in First Arm (McGovern-Wilson, 1985). There is an unrecorded rock shelter on the Shelter Islands and a significant Maori burial cave on the north side of Malaspina Reach (also unrecorded) (Shaw).

There is a plaque at the southern end of Bauza Island commemorating the early exploration of the area by the Spanish in 1793 under the command of Alessandro Malaspina, and a number of Spanish placenames first charted at this time still remain today. The Maori name for Doubtful Sound is Patea, after the "lost tribe" Patea of whose territory this area was part. One of the overland routes traditionally used by the Maori was from Doubtful to Lake Manapouri (Beattie, 1949).

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990). As part of the nomination of South West N.Z. as a World Heritage site this area has international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cdej

Gorse (*Ulex europaeus*) has been recorded and controlled at the north western end of Malaspina Reach, and at Deep Cove. Red deer are present in low numbers at Deep Cove, and possums have also invaded this area possibly from the road through to Lake Manapouri. There is an allocated rubbish dump for fishermans waste on Blanket Bay Island (Shaw). There is a small sewage outfall from a septic tank at the hostel at Deep Cove.

Human Modification and Human Use: bdehik

There are many anchorage sites within this fiord possibly reflecting the number of fishing vessels that use the area; most notably at Blanket Bay, The Gut, and Deep Cove (where there are also moorings and large jetties) (Ward; Shaw, 1983). Most of Doubtful Sound is under a moderate amount of recreational fishing pressure and diving trips to the area are becoming increasingly popular. Commercial rock lobster fishing is present throughout the entrances to the fiords and on the outer coast (Voller, 1983). At least 5 tourist

vessel operators are present in the area, 2 of which operate on a regular basis. There are several shore based walks around the head of Deep Cove, used by school children on trips to the Deep Cove Hostel (approximately 3000/year) and by the public frequenting the area. The head of Doubtful Sound has been extensively modified to accommodate a tailrace outfall from the Lake Manapouri Hydro electric power scheme. The tailrace embankments involved massive reclamations and as a result the shape of the shoreline has been altered irreparably. There is a freezer and hut on Blanket Bay Island operated by the fish packing company.

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries Regulations.

Availability of Information:

Natural	1	<u>2</u>	3	1 Well documented.
Cultural	1	<u>2</u>	3	2 Limited information (general).
Historic	1	<u>2</u>	3	3 Little information (if any).
Threats	1	2	<u>3</u>	
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	<u>1</u>	2	3	<u>4</u>	5	6	7	1. Derived info from existing lit. & databases
Cultural	<u>1</u>	2	3	<u>4</u>	5	6	7	2. Derived info as above & field check
Historic	<u>1</u>	2	3	<u>4</u>	5	6	7	3. Derived from existing maps & aerial photos
Threats	<u>1</u>	2	3	<u>4</u>	5	6	7	4. Recent DOC survey incl sampling & analysis
Human Mod. & Use	<u>1</u>	2	3	<u>4</u>	5	6	7	5. Recent DOC survey excl sampling & analysis
	<u>1</u>	2	3	<u>4</u>	5	6	7	6. Experience
	<u>1</u>	2	3	<u>4</u>	5	6	7	7. Expert advice

Comment:

Recorded on Existing Databases: Comment:

1. WERI
2. SSWI
3. PNA Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

With a large supply of foreign (eastern) freshwater emptying into the fiord, the effects of the tailrace on the Deep Cove underwater ecology are largely unknown. The tailrace is almost certainly the cause of a resident population of rainbow trout in Deep Cove (rainbow trout are rarely recorded in West Coast rivers of the S.I.). The N.Z. Oceanographic Institute have however estimated the outfall makes up approximately 1% of the fiords total catchment.

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1. Morrison, K.R. Map of birds observed in Fiordland National Park, Te Anau DOC, and pers. comm. (C/o P.O., MacAndrew Bay, Dunedin).
2. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
3. Grange, K.R. Pers. comm., C/o Div. Mar. & Fr. Water Science, D.S.I.R., Well.
4. Shaw, L. DOC Te Anau, Pers. Comm.
5. Thomas, B.W. 1986. Distribution and Ecology of the Fiordland skink (*Leiopisma acrinatum* Hardy) Draft copy on File FNP 28/2 Vol VI, DOC Te Anau.
6. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.
7. Ward J.; Shaw L. 1983. Fiordland coastal anchorages (held in D.O.C. Te Anau).
8. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
9. Beattie, H. 1949. The Maoris in Fiordland.
10. Wells, S.M. International Union for Conservation of Nature and Natural Resources, Red data book for invertebrates.
11. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage list, Govt. printer Wellington.

Accompanying Maps and Photographs:

Site Names: Secretary Island

Site No: 140060

Recorders Name: Simon Hayes

Conservancy: Southland

Map No/Grid Ref: NZMS 262 (SHT 14) 20340 55350

Date: 22 03 90

Brief Description of Site:

Secretary Island has a high degree of naturalness. The island is large and rugged, covering an area of about 9000 hectares. It is situated between the entrances of Thompson and Doubtful Sounds. This area is a 'specially protected area' under the provisions of section 12 of the National Parks Act 1980 and entry is restricted. The vegetation is basically unmodified with only a small resident population of deer and consists of mostly low altitude forest - silver and mountain beech, with a hardwood (mostly rata and kamahi) fringe near the shore. On the west coast of the island there are some areas of mixed scrub including fuchsia, broadleaf, pepperwood etc. The bedrock is mostly gneiss with small pockets of uncemented alluvial gravels in the valleys. Topographically, Secretary Island is made up of rolling terrain (ice worn) with steep slopes and precipitous ledges - reflecting the glacial origins of Fiordland (McEwen, 1987). The maximum height of the island is 1147m.

Conservation Values:

Natural: abcdg

Cultural: bc

Historic:

Comment:

In the coastal forest around Secretary Island S.I. brown kiwi (*Apteryx australis australis* - threatened), S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), N.Z. falcon (*Falco novaeseelandiae* - threatened), parakeets (*Cyanoramphus auriceps auriceps*) have been recorded. This island population of S.I. brown kiwi has probably been isolated since glacial times. Koaro (*Galaxias brevipinnis*) and banded kokopu (*Galaxias fasciatus*) have been recorded in tributaries behind the Gut hut and up to Secretary Lake (Morrison).

There are several N.Z. fur seal (*Arctocephalus forsteri*) haulouts along the outer west coast of Secretary Island (breeding) (Wilson, 1981).

Secretary Island was originally set apart because of its unmodified vegetation (it was regarded as having low deer numbers at that time). While it now seems to have a small resident population of deer, it is still of considerable scientific importance in that it is apparently still rodent free (Cooper).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

With only one unconfirmed site of early cave occupation on Blanket Bay Island there is little historical/archaeological information available on this site.

The Maori name for the island is Ka-tu-waewae-o-tu; this relates to its part in the legend of the great god Tu who carved the fiords out of a previously unbroken mountain chain causing the land on which his feet were planted to separate from the mainland and form Resolution and Secretary Islands (Dept. Lands & Surveys, 1986).

Site Importance: International National Regional Local Unknown

Comment:

The high degree of naturalness, relatively unmodified vegetation, lack of rodents and also being part of Fiordland (part of an area nominated for World Heritage status - D.O.C., 1989) merits this sites inclusion as internationally important.

Existing Threats:

Type and Comment: d j

Although there are regular DOC culling trips to the island a small population of deer persists, probably due to the fact deer can reach the island by swimming from the mainland. Deer can modify the protective coastal vegetation. At Blanket Bay there is fishermans rubbish dump site (Shaw).

Human Modification and Human Use: d k

Comment:

At Blanket Bay Island on the south eastern end of the island, there is a rock lobster (*Jasus edwardsii*) fishing base consisting of sheds, jetty, fuel and holding tanks. An emergency helicopter pad has also been constructed. The area between Blanket Bay and Secretary Islands is a heavily used anchorage site mostly by fishing vessels (Ward; Shaw, 1983). Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection:

Type and Comment: a d

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark. Action is currently being taken with a view to uplifting the 'specially protected area' status from this area. Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Despite several scientific expeditions by local universities to the Island there does not appear to be a lot of detailed information on the island available yet.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. Secretary Island. 1904 National Park.
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

References

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC. and pers. comm. (C/- P.O, MacAndrew Bay, Dunedin).
2. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), F.R.D., Occ. Publ 20.
3. Cooper, W.J. Areas of Ecological, Historical or Archaeological significance, App. 2, Published in Southland Regional Planning Scheme Sect. 3 (included in the background papers volume).
4. Shaw, L. D.O.C. Te Anau, Pers. Comm.
5. Ward, J.; Shaw, L. 1983. Fiordland coastal anchorages. D.O.C. Te Anau.
6. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
7. The story of Fiordland National Park. 1986. Dept. of Lands and Survey.
8. McEwen, M. (edt.) 1987. Ecological Regions and Districts of New Zealand, DOC.
9. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Thompson and Bradshaw Sounds

Site No: 140061

Recorders Name: Simon Hayes

Conservancy: Southland

Map No/Grid Ref: NZMS 262 (SHT 14) 20410 55300

Date: 20 03 90

Brief Description of Site:

Thompson Sound is nearly 20 km long and runs south-south-eastward behind Secretary Island to a junction with Bradshaw and Doubtful Sound. As with all the northern fiords Thompson and Bradshaw are characterised by glacially formed classic 'U' shapes with steep sea cliffs and deep basins behind a shallow entrance formed by a morainic rock sill. Thompson Sound is 20 km long, covers an area of about 24 sq. km and has a maximum depth of 336 m.

Bradshaw Sound is 16 km long, covers an area of 21 sq. km and is very deep with a maximum depth of 416 m. The upper reaches divide into two narrow precipitous arms each being fed by a large catchment. Gaer Arm has an extensive intertidal area at the head formed from the delta of the Camelot River. Large gneiss walls form the bed rock of these fiords and uncemented alluvial gravels occur in the mouths of lower valleys. There is a large block of coarse crystalline rock at Crayfish Heights, in Thompson Sound. The main vegetation type is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) in the valleys behind the beaches.

Conservation Values:

Natural: abcdeghi

Cultural: bcd

Historic: b

Comment:

This is a remote area with a high degree of naturalness.

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed as threatened internationally - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique nature of these communities, and their dependence on the terrestrial surroundings is of international scientific interest (Grange, 1990).

There is a large colony of breeding broad billed prions (*Pachyptila vittata vittata*) on a rocky outcrop just to the north of Thompson Sound. In coastal forest just below Crayfish Heights parakeet (*Cyanoramphus auriceps auriceps*) and N.Z. falcon (*Falco novaeseelandiae* - threatened) have been recorded. In Bradshaw Sound there are S.I. brown kiwi (*Apteryx australis australis* - threatened) in coastal forest at the mouth of the Rum River and at the mouth and lower reaches of the Camelot River, blue duck (*Hymenolaimus malacorhynchos* - threatened) have been recorded. Some freshwater fish species that have been reported from small tributaries behind MacDonnell Island include koaro (*Galaxias brevipinnis*), banded kokopu (*Galaxias fasciatus*), inanga (*Galaxias attenatus*), red-finned bully (*Gobiomorphus huttoni*) and long finned eels (*Anguilla dieffenbachi*) (Morrison).

At the mouth of the Pandora River (Open Cove) there is a sandy beach backed by a small dune covered in pingao (*Desmoschoenus spiralis* - a rare sand sedge) (Johnson, 1979).

At the mouth of the Namu River there is a large freshwater spring 90 - 100' underwater, with very heavy flow after periods of rain (Shaw).

Crayfish Heights are a massive collection of bald granite cliffs on the northern side of Thompson Sound

and are of geologically scenic interest.

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

Te Anau to Bradshaw Sound is one of the routes to Fiordland known to have been used by local Maori. Within Thompson Sound is a large cave known as a sealers cave (Beattie, 1949). This may have been the cave called Taratu. The Maori name associated with Thompson Sound is Te Moenu, after an ancestor; and for Bradshaw Sound Kai-kie-kie (to eat kiekie). Many of the points in this area have Maori names, which reflect the areas history and usage (Ibid). See also the Summary of the Maori values of Fiordland. Percy Seymour, a school teacher turned bird collector and prospector, occupied Seymour Island in Pendulo Reach from 1887-1888. An historic hut site is all that remains (McGovern-Wilson, 1985).

Site Importance:	<u>International</u>	National	Regional	Local	Unknown
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Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area has international importance.

Existing Threats:

Type and Comment: cdj

Johnson (1979) has recorded 7 weed species in this area including gorse and marram grass at Neck and Deas Cove, Thompson Sound. Johnson also records deer browsing at a medium level at Neck Cove (which can modify the protective coastal vegetation). There is a rubbish and fuel dump used by local fishermen at Deas Cove (Shaw).

Human Modification and Human Use: dhik

Several anchorages are utilised in this area: Precipice Cove, Lyall Bay and Neck and Deas Cove and all receive medium usage from local fishing vessels (Ward). Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast and the full length of Bradshaw sound (Voller, 1983). The hut at Deas Cove often serves as a base for the Fiordland Big Game Fishing Club during the summer months. Hunting for red deer is a popular recreational pursuit in the lower reaches of the Camelot River, and is the southern limit of Wapiti (Shaw).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

There is little detailed information available on these fiords.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases: Comment:**

The inclusion of the intertidal area at the end of Gaer Arm, in WERI and the Wetlands of national importance to fisheries database may be warranted.

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:**References**

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and Pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
3. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
4. Shaw, L. DOC Te Anau, Pers. Comm.
5. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.

6. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
 7. Ward, J. Fiordland Coastal Anchorages, D.O.C., Te Anau.
 8. Voller, R.W. 1983. Fisheries. Southland Reg. Planning Scheme Sect 3. (included in the background papers).
 9. Wells, S.M. International Union for Conservation of nature and Natural Resources, Red Data book for Invertebrates.
 10. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. Printer, Wellington.
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Accompanying Maps and Photographs:

Site Names: Nancy Sound

Site No: 140062

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20450 55450

Date: 20 03 90

Brief Description of Site:

As with all the northern fiords Nancy is characterised by a glacially formed classic 'U' shape with steep sea cliffs and 3 deep basins behind a shallow entrance formed by a morainic rock sill. The upper reaches of the 15 km fiord make a sharp northerly turn giving the fiord the overall appearance of a leg hence the placenames 'Leg Head', 'Heel Cove' and 'Toe Cove'. The fiord covers an area of about 14 sq. km and has a maximum depth of 279 m. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the fiord head. The main vegetation type is beech with lowland podocarp (e.g. rimu)/hardwoods (e.g. rata, kamahi) in the valley behind the fiord head. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath (Glasby, 1978).

Conservation Values:

Natural: abcdgh

Cultural: bcd

Historic:

Comment:

This is a remote area with a high degree of naturalness.

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed as internationally threatened by the I.U.C.N - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependance on the terrestrial surroundings is of international scientific interest (Grange, 1990).

On the north west side of Nancy Sound, opposite Sweep Point there have been sightings of reef heron (*Egretta sacra sacra* - threatened) (Morrison).

On Entrance Island on the north side of entrance to the fiord Fiordland skink (*Leiopisma acrinasum*) have been recorded at their northern limit. Considering the recent distribution records known for this species (almost entirely restricted to about 30 rock stacks and islets) it probably merits a threatened conservation status (Thomas, 1986). A small N.Z. seal (*Arctocephalus forsteri*) colony is present on the island and broad billed prions (*Pachyptila vittata vittata*) have been recorded here. There is a large seal rookery at Anxiety Point, the southern headland to the fiord (Wilson, 1981).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

There has been no detailed historical/archaeological site surveying done in this fiord. However Nancy Sound was almost certainly used by sealers, as Rudder cave at the fiord entrance is an historically known cave that was used by sealers.

The Maori name for Nancy Sound is Hinenui (big woman). The low number of features named by Maori in this fiord when compared to other fiords would suggest this area was one of the least visited of the fiords (Glasby, 1978). Several Maori place names within the sound are associated with the Patea tribe, fugitives from Taranaki, of which this area was part of their territory. Other names are associated with the historical presence of the kakapo (*Strigops habroptilus*). Te He-o-hapopo (Anxiety Point) is named after the error of Hapopo a tohuka who fled to the sounds for refuge. Fearful of being followed he left this refuge for Martins Bay where he was killed (Beattie, 1949). A known Maori route to the sounds was from Lake Te Anau to Nancy Sound.

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area is of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: c

A small patch of gorse (*Ulex europaeus*) at Heel Cove is being kept in check by DOC staff on occasional field trips. There are no other documented existing threats in this fiord (Shaw).

Human Modification and Human Use: dk

One well known anchorage is at the head of the fiord and receives heavy usage from local fishing vessels (Ward, Shaw, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection:

Type and Comment: a

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries Regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	2	<u>3</u>	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

There is little detailed information available on this fiord, especially with regard to local history and the underwater ecology.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases: Comment:**

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:**References**

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O., MacAndrew Bay, Dunedin).
2. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), Fisheries research Div. Occ. publ. 20.
3. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
4. Thomas, B.W. 1986. Distribution and Ecology of the Fiordland skink (*Leiopismis acrinasum* Hardy).

Draft copy on File FNP 28/2 Vol VI, DOC Te Anau.
5. Ward J.; Shaw L. 1983. Fiordland coastal anchorages. (D.O.C Te Anau).
6. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
7. Glasby, G.P. 1978. Fiord studies: Caswell and Nancy Sounds, New Zealand, N.Z. Oceanographic Institute Memoir 79, Wellington.
8. Beattie, H. 1949. The Maoris and Fiordland.
9. Wells, S.M. International Union for Conservation of Nature and Natural Resources, Red data book of invertebrates.
10. D.O.C. 1989. Nomination of South-West New Zealand for inclusion of the World Heritage list, Govt. Printer, Wellington.
11. Shaw, L. C/- D.O.C. Te Anau, pers. comm.

Accompanying Maps and Photographs:

Site Names: Charles Sound

Site No: 140063

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20480 55520

Date: 20 03 90

Brief Description of Site:

As with all the northern fiords Charles is characterised by a glacially formed classic 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance formed by a morainic rock sill. The upper reaches of the 14 km fiord divide into two arms each fed by a large river. Emelius Arm has an extensive intertidal area at the head - the Irene estuary. The fiord covers an area of about 16 sq. km and is 221 m at its maximum depth. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the fiord head. The main vegetation type is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) along the southern side of the entrance and in the valley behind the fiord head.

Conservation Values:**Natural:** abcdgh**Cultural:** bcd**Historic:****Comment:**

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed as threatened internationally by I.U.C.N. - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependance on the terrestrial surroundings is of international scientific interest (Grange, 1990).

The Irene River has formed a significant delta at the head of Emelius Arm. This intertidal area is known to support a large number of grey duck (*Anas superciliosa superciliosa*), paradise shelduck (*Tadorna variegata*) and pied shags (*Phalacrocorax varius varius*). In Gold Arm, Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded breeding on Fanny Island (Morrison).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords). It is also an area with a high degree of naturalness.

The Maori name for this fiord is Taiporopora after an historic character who frequented these parts three centuries ago; it literally means very full tide. Several points also have Maori names reflecting the historical occurrence of kakapo (*Strigops habroptilus* - endangered) and takahe (*Notornis mantelli* - endangered) here. A sandy beach here is called Te Onene and the cliff behind it Te Paheke-o-kahura, after its creator Kahukura, who assisted the god Tu, to create this fiord. Kahukura, overcome with woman's weakness created the beach, sat down and rested on it. This area was also the refuge of the Patea, fugitive people from Taranaki driven south through Westland to the fiords (Beattie, 1949). A known Maori route to the fiords was from Te Anau to Charles, Nancy or Bradshaw Sounds. (See Summary of the Maori values of Fiordland).

This fiord has not been surveyed for historical and/or archaeological sites.

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area has international importance (D.O.C., 1989).

Existing Threats:

Type and Comment:

There are no existing threats documented for this fiord.

Human Modification and Human Use: dk

Three anchorage sites are utilised in the fiord mostly by fishing vessels: at the head of Emelius Arm, Eleanor Island, and the head of Gold Arm and all three have medium usage (Ward, Shaw, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection:

Type and Comment:

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebait is prohibited in Fiordland National Park by West Coast fisheries regulations.

Availability of Information:

Natural	1	2	<u>3</u>	
Cultural	1	<u>2</u>	<u>3</u>	1 Well documented.
Historic	1	2	<u>3</u>	2 Limited information (general).
Threats	1	2	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

There is little detailed information available on this fiord.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases: Comment:

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

The distinct lack of any detailed ecological and historical information both above and below the water for this fiord warrants its inclusion for additional survey work.

References

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
2. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
3. Ward, J.; Shaw, L. 1983. Fiordland coastal anchorages. D.O.C. Te Anau.
4. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
5. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
6. Wells, S.M. International Union for Conservation Nature and Natural resources, Red data book for Invertebrates.
7. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.

Accompanying maps and photographs:

Site Names: Caswell Sound

Site No: 140064

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20550 55590

Date: 20 03 90

Brief Description of Site:

As with all the northern fiords Caswell is characterised by a glacially formed classic 'U' shape with steep sea cliffs and two deep basins behind a shallow entrance formed by a morainic rock sill. The fiord is 16 km long and like Milford Sound is not divided anywhere along its length. The fiord covers an area of 17.5 sq. km and is 416m at its deepest depth. The rocky headlands form the western boundary of this site. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. Large gneiss walls form the bed rock of the fiord with occasional blocks of marble and schist on the southern side. Uncemented alluvial gravels occur at the fiord head. The main vegetation type is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) in the valley behind the fiord head.

Conservation Values:

Natural: abcdgh

Cultural: abcd

Historic: bc

Comment:

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed in I.U.C.N. as threatened internationally - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique nature of these communities, and their dependence on the terrestrial surroundings is of international scientific interest (Grange, 1990).

At the northern and southern sides of the entrance to the fiord are small N.Z. fur seal (*Arctocephalus forsteri*) haulout areas. Styles Island, located on the southern side of the fiord entrance, is an important Fiordland crested penguin (*Eudyptes pachyrhynchus pachyrhynchus*) breeding site. The lower river and mouth of the sound supports a small population of blue duck (*Hymenolaimus malacorhynchus* - threatened). Leopard seals (*Hydrurga leptonyx*) have been recorded hauling out in this area (leopard seals are rarely seen within the fiords) (Morrison).

This is a remote area with a high degree of naturalness. As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

The Maori name for Caswell Sound is Tai-te-timu (ebbing tide). The low number of features named by Maori in this fiord when compared to other fiords would suggest this area was one of the least visited of the fiords (Glasby, 1978/Beattie, 1949). See Summary of the Maori values of Fiordland.

From 1882-1887 the Caswell Sound Marble Company quarried marble for statuary work at a site on the south side of the fiord about 1.5 km west of Dog Point. Some artefacts still remain. A large Maori campsite has been recorded on the north side of the fiord (McGovern-Wilson, 1985).

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area has international importance (Glasby, 1978).

Existing Threats:

Type and Comment: cd

There is little documented information on existing threats at this site. However, the fact that Caswell Sound is frequently visited by hunting parties would suggest that deer are most likely present at least in the lower valleys. Gorse (*Ulex europaeus*) has been recorded at the head of the sound however this is being kept in check by occasional DOC field checks (Shaw).

Human Modification and Human Use: dk

Two anchorage sites are utilised in the fiord by mostly by fishing vessels: at Boat Rock about a third of the way up the fiord, and at the head of the fiord (Ward, Shaw, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983). There is little human impact or modification to this fiord.

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

There is little detailed information available on this fiord.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	<u>6</u>	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases:

Comment:

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

References

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O MacAndrew Bay, Dunedin).
 2. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*).
 3. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
 4. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.
 5. Ward J.; Shaw L. 1983. Fiordland coastal anchorages, DOC Te Anau.
 6. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
 7. Glasby, G.P. 1978. Fiord studies: Caswell and Nancy Sounds, New Zealand, N.Z. Oceanographic Institute Memoir 79, Wellington.
 8. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
 9. Wells, S.M. International Union for Conservation of Nature and Natural resources, Red data book for Invertebrates.
 10. Shaw, L. pers. com. C/- D.O.C. Te Anau.
 11. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List. Govt. printer, Wellington.
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Accompanying Maps and Photographs:

Site Names: George Sound

Site No: 140065

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS262 (SHT 14) 20660 55730

Date: 20 03 90

Brief Description of Site:

As with all the northern fiords George is characterised by a glacially formed classic 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance formed by a morainic rock sill. The upper reaches of the 21 km fiord divide into two short arms. The fiord covers an area of about 33 sq. km with a maximum depth of 224 m. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the ends of the arms. The main vegetation type around the fiord is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) in the valley behind the fiord head.

Conservation Values:

Natural: abcdegh

Cultural: abcd

Historic: b

Comment:

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis*, listed by the IUCN as threatened internationally - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependence on the terrestrial surroundings is of international scientific interest (Grange, 1990).

Opposite Anchorage Cove a very large sea pen species has been recorded on sandy substrate at about 40m depth. Grange (pers. comm.) has suggested this is an undescribed species of *Sarcophyllum* (Grange).

In Anchorage Cove there is a large underwater hot spring in about 1m of water (GEOPRESERVATION).

S.I. brown kiwi (*Apteryx australis australis* - threatened) have been recorded at the head of George Sound in the coastal forest surrounding the hut. On a rock stack off a point on the west side of the entrance to South West Arm Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded moulting (Morrison).

There are well known N.Z. fur seal (*Arctocephalus forsteri*) haulout areas on the northern and southern side of the entrance to George Sound and south to Houserook Rock (Wilson, 1981).

Houserook Rock is of scenic geological interest due to its unique shape as the name would suggest (Morrison/Shaw).

This is a remote and highly natural area. As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

For additional cultural values refer to the Summary of the Maori values of Fiordland. The Maori name for George Sound is Te Houhou, said to be named after a man. It was also occasionally called Hawea after the legendary 'Lost Tribe' (see Bligh Sound site record sheet). The mountains along both sides of the fiord have names related to the karakia said by Tu when he created the fiords (Beattie, 1949). As a number of adze caches and artefacts have been found at the mouth of the George River, Anchorage

Cove, it has been suggested this area may have been an additional source (to that used at Milford Sound) of tangiwai or bowenite for early Maori living in the area (McGovern-Wilson, 1985).

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area has international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: idcj

A small population of scallops (*Pecten novaeselandiae*) has been decimated by recreational divers at the head of the fiord (Adams). The extent and numbers of deer present is not documented. However, the fact that George Sound is frequently visited by hunting parties would suggest that deer are most likely present at least in the lower valleys. A small patch of gorse (*Ulex europaeus*) at Anchorage Cove is being kept in check by occasional DOC field trips. Anchorage Cove also has an allocated dump site for local fishermen's waste (Shaw).

Human Modification and Human Use: dhk

Comment:

As an end point to the George Sound Track from the Middle Arm of Lake Te Anau, the head of George Sound provides a resting point for trampers visiting the area normally during the summer months. Recreational hunting for red deer and wapiti is popular here, particularly during 'the roar' (early April). Several anchorages are commonly used by local fishing vessels within the fiord: Anchorage Cove and the head of the sound have medium usage, and South West Arm has low usage (Ward/Shaw) Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the entrances to the fiords and on the outer coast. Commercial paua (*Haliotis iris*) fishing at the entrance of the fiord has increased significantly in recent years (pers. obs.).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	2	<u>3</u>	

Comment:

There is little detailed information available on this fiord.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases:Comment:**

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation 1988. Hot Water Spring.
5. HPT County Inventories
6. Other
7. None

Other Considerations:**References**

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
2. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*)
3. GEOPRESERVATION Inventory, Draft inventory of geological and landscape features, Southern Region 1988. Geological Soc. N.Z.
4. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
5. Grange, K.R. Pers. comm., C/o Div. Mar. & Fr. Water Science, D.S.I.R., Well.
6. Shaw, L. DOC Te Anau, Pers. Comm.
7. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.

8. Ward, J.; Shaw, L. 1982. Fiordland coastal anchorages. D.O.C. Te Anau.
 9. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
 10. Adams, G. DOC Te Anau, Pers. comm.
 11. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
 12. Wells, S.M. International Union for Conservation Nature and Natural resources, Red data book for Invertebrates.
 13. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
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Accompanying Maps and Photographs:

Site Names: Bligh Sound

Site No: 140066

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20770 55870

Date: 20 03 90

Brief Description of Site:

As with all the northern fiords Bligh is characterised by a glacially formed classic 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance formed by a morainic rock sill. The sound is narrow and precipitous, and has 3 reaches that zig-zag inland for nearly 18 km, covering an area of about 21 sq. km. The maximum depth recorded for Bligh Sound is 186 m. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the fiord head. The main vegetation type around the fiord is beech with lowland podocarp (e.g. rimu)/ hardwoods (e.g. rata, kamahi) in the valley behind the fiord head.

Historically, early European encounters with local Maori gave rise to placenames in the area: Wild Natives River, Escape Cove, and Alarm Mountain.

Conservation Values:

Natural: abdgh

Cultural: abcd

Historic: b

Comment:

This a remote highly natural area.

The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis*, listed by the IUCN as threatened internationally - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependance on the terrestrial surroundings is of international scientific interest (Grange, 1990).

At Flat Point just south of the entrance to Bligh Sound there is a frequently occupied N.Z. fur seal (*Arctocephalus forsteri*) haulout area (McGovern-Wilson, 1985) Dusky dolphins (*Lagenorhynchus obscurus*) have been recorded within this sound; they are rarely seen inside the fiords (Morrison).

S.I. brown kiwi (*Apteryx australis australis*) (threatened) have been recorded in coastal forest on the northern side of the sound below Cloudy Pass. There is an historical record of up to 20 brown teal (*Anas aucklandica chlorotis* - endangered) in the lower reaches of the Wild Natives River valley at the head of the fiord in 1961 (Morrison).

As with all of Fiordland this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords).

For additional cultural values refer to the Summary of the Maori values of Fiordland. The Maori name for Bligh Sound, Hawea, is associated with the recognition of this and adjacent fiord areas, as the territory of the legendary 'Lost Tribe'. The Hawea, a sub tribe from Otago, are thought to have fled to Fiordland after bitter family feuds with Kaitahu. Several reference points in the sound also have names associated with their presence (Beattie, 1949). Other fugitives who frequented this area were from the Kati - wairangi and Patea, from Patea in Taranaki who were driven south through Westland.

In 1851 Capt. Stokes of the European survey vessel 'Acheron' recorded brief encounters with local Maori present in the area at the time. Several rock shelters with extensive fish bone and shell middens have been recorded at the head and the northern side of the fiord in recent years (McGovern-Wilson, 1985).

Site Importance: International National Regional Local Unknown

Comment:

The unique subtidal biological communities in the fiords are of international scientific interest (Grange, 1990).

As part of the nomination of South West New Zealand as a World Heritage site this area has international importance (D.O.C. 1989).

Existing Threats:

Type and Comment: d

The extent and numbers of deer and wapiti present is not documented. However, the fact that Bligh Sound is frequently visited by hunting parties would suggest that deer are most likely present at least in the lower valleys (Hayes - pers. obs.).

Human Modification and Human Use: dk

Several anchorages are commonly used by local fishing vessels within the fiord: at Turn round Point, and below Bare Cone (both are of medium usage) and at the head of the fiord (heavy usage) (Ward, Shaw, 1983). Commercial rock lobster (*Jasus edwardsii*) fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983). Recreational hunting for red deer occurs in the area from time to time.

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited by West Coast Fisheries regulations in Fiordland National Park.

Availability of Information:

Natural	1	<u>2</u>	<u>3</u>	
Cultural	1	<u>2</u>	<u>3</u>	1 Well documented.
Historic	1	<u>2</u>	<u>3</u>	2 Limited information (general).
Threats	1	<u>2</u>	<u>3</u>	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	<u>3</u>	

Comment:

There is little detailed information available on this fiord.

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases:

Comment:

1. WERI
2. SSWI
3. PNA - Doubtful Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

References

1. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
2. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), Fisheries Research Div., Occ. Pub. 20.
3. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
4. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.
5. Ward, J.; Shaw, L. 1983. Fiordland coastal anchorages. (D.O.C Te Anau).
6. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
7. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
8. Wells, S.M. Red data book for Invertebrates, International Union for Conservation of Nature and Natural Resources.
9. D.O.C. 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List. Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Sutherland Sound

Site No: 140067

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20840 55940

Date: 20 03 90

Brief Description of Site:

Sutherland Sound is the next main fiord south of Milford. It is unique among the fiords in having its middle portion (formed from a morainic sill) constricted by forested flats and a sand spit, with an estuary separating the outer seaward part from the inner, 3 km long salt water 'lake'. At low tide it has an estuarine appearance with sinuous channels crossing the extensive mud and sand flats. Large gneiss walls form the bed rock of the fiord and uncemented alluvial gravels occur at the fiord head. The main vegetation type around the fiord is beech with lowland podocarp/hardwoods in the valley behind the fiord head.

Conservation Values:**Natural:** abcdeg**Cultural:** abcd**Historic:** b**Comment:**

This is a highly natural area with little human impact.

Dunes composed of black sand dominate the northern side of the entrance to Sutherland Sound, and pingao (*Desmoschoenus spiralis* - a rare sand sedge) occurs on the dune faces (Johnson, 1979).

Occasionally white heron (*Egretta alba modesta* - endangered) have been observed feeding at the intertidal area. This area also supports a wide range of waterfowl and waders including black swans (*Cygnus atrata*), paradise shelduck (*Tadorna variegata*), breeding variable oystercatchers (*Haematopus unicolor* - a threatened species), black backed gulls (*Larus dominicanus*) and pied shags (*Phalacrocorax varius varius*). Marsh crake (*Porzana pusilla affinis*) have been recorded in the salt marsh areas. S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare), and S.I. brown kiwi (*Apteryx australis australis* - threatened) have been recorded in coastal forest on the south side of the entrance to the sound (Morrison).

The inner 'lake' supports a relatively different marine fauna in comparison with the characteristic steep wall fiord communities seen in most other fiords. Some notables include the large number of cancer crabs (*Cancer novaezelandiae*) and large anemones seen here in diving depths. The inner lake is also a nursery for giant kokopu (*Galaxias argenteus*) and giant bully (*Gobiomorphus gobiodes*) (Shaw). Bottle nose dolphins (*Tursiops truncatus*) have often been recorded in the inner lake.

There is a small N.Z. fur seal (*Arctocephalus forsteri*) haulout area just north of the sound entrance and Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded breeding in the same area (Wilson, 1981/Morrison).

Sutherland Sound, particularly the estuary, dunes and inner lake have distinctive aesthetic and landscape values. For additional cultural values refer to the Outer coast of the northern fiords site sheet and the Summary of the Maori values of Fiordland. The Maori name for Sutherland Sound is Te Hapua (big lagoon). The fiord and surrounding area is part of the territory of the legendary 'Lost Tribe' - The Hawea, a sub tribe from Otago, who are thought to have fled to Fiordland after bitter family feuds with Kaitahu. (Beattie, 1949).

There are two large caves with evidence of early Maori occupation located north east of the entrance to the sound (McGovern-Wilson, 1985).

Site Importance: International National Regional Local Unknown

Comment:

The unique and extensive estuarine nature of Sutherland Sound (even amongst the fiords), unusual habitats, important wetland, as part of Fiordland National Park (part of the nomination of South West New Zealand as a World Heritage site) and the fact that the fiord is largely unmodified warrant this sites inclusion as an area of international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: cd

Johnson (1979) reports only low numbers of deer present around the fiord, and only 6 weed species including gorse (*Ulex europaeus*) present. DOC is presently maintaining a weed eradication program to keep the main invasive plant species out of area.

Human Modification and Human Use: d

One exposed anchorage site is known on the southern side of the sound entrance and has only low usage (Ward, Shaw, 1983). Because access into the inner part of the fiord is restricted to vessels with very shallow draft this area has not been utilised by commercial rock lobster fishermen at present or in the past.

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark. Whitebaiting is prohibited in Fiordland National Park by West Coast fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	3	2 Limited information (general).
Threats	1	<u>2</u>	3	3 Little information (if any).
Human Mod. & Use	1	2	<u>3</u>	

Comment:

Sources of Information:

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Recorded on Existing Databases:**Comment:**

It is possible the inner lake is an important nursery area for a number of fish species and should be included in the database for important wetland fish nursery areas. However further investigative work needs to be done to warrant the inclusion.

1. WERI
 2. SSWI
 3. PNA - Doubtful Ecol. Dis. 1904 National Park
 4. GEOPRESERVATION
 5. HPT County Inventories
 6. Other
 7. None
-

Other Considerations:

The unique estuarine nature of this fiord warrants considerable additional scientific investigation especially with regard to the sub tidal communities within the inner 'lake'.

References

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
 2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
 3. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), Fisheries research Div. Occ. publ. 20.
 4. Shaw, L. DOC Te Anau, Pers. Comm.
 5. McGovern-Wilson, R. 1985. Fiordland National Park. A gazetteer of historic and archaeological sites, Dept. of Lands and Survey, Invercargill.
 6. Ward, J.; Shaw, L. 1983. Fiordland Coastal Anchorages, Held in D.O.C, Te Anau.
 7. D.O.C. 1989. Nomination of South-Westland New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
 8. Beattie, H. 1949. The Maoris and Fiordland.
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Accompanying Maps and Photographs:

Site Names: Poison Bay

Site No: 140068

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 20850 56020

Date: 20 03 90

Brief Description of Site:

Located between Milford and Sutherland Sound, Poison Bay is a short glacially carved fiord, the beach at its head being 5 km from the open sea. Sand covers the southern 400m of beach and the rest is composed of cobbles and boulders. Backing the beach dunes the forest is mostly kamahi, with silver beech, rata and broadleaf. The northern and southern sides of the bays' entrance are rocky outcrops and form the western boundary of this site. The short nature of Poison Bay in comparison with other fiords means the bay is very exposed to prevailing westerly winds.

Conservation Values:

Natural: abcdeg

Cultural: abcd

Historic:

Comment:

This area is highly natural, the forest and shoreline have very few modifications, apart from deer and possums (McEwen, 1987) and as such has high landscape value.

Seabreeze Point (the northern headland) is a well known N.Z. fur seal (*Arctocephalus forsteri*) rookery and haulout. 100-300 individuals were estimated in 1973 (Wilson, 1981). Sooty Shearwaters (*Puffinus griseus*) are known to breed in large numbers on an island off Seabreeze Point (Morrison).

At the head of the bay, a low level dune supports a population of pingao (*Desmoschoenus spiralis*) (a rare sand sedge) on the dune faces. Another sedge (*Cyperus usulatus*) has been recorded here at its southern limit 1979 (Johnson, 1979).

Behind the dunes S.I. brown kiwi (*Apteryx australis australis*) (threatened) has been recorded in coastal forest and giant kokopu (*Galaxias argenteus* - indeterminate status) have been observed in a backwater just NE of the the river mouth. Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) have been recorded moulting at the head of the bay. There has been a reliable though unconfirmed sighting of S.I. kokako (*Callaeas cinerea cinerea* - endangered) across the river mouth (Morrison).

Hydrogen gas springs have been recorded by the D.S.I.R. at the SW end of the bay (Peacock).

The Maori name for Poison Bay is Papa pounemu, as a small quantity of inferior greenstone was available here. At a creek called Umu-mata, Tommy Chasland's sealers massacred a group of Maori who were cooking and eating seals. Also at this site is Te Tara-o-te-puhi-tuia which recalls the rape, by sealers, of a high born lady betrothed to a chief. Seabreeze Point is Ko-mate-kohoru after Te Matapou from the Ross area who was murdered here (Beattie, 1949). (See Summary of the Maori values of Fiordland.) For additional cultural values refer also to the Outer coast of the northern fiords site record sheet.

There are no archaeological sites recorded in this area; it has yet to be surveyed in detail.

Site Importance: International National Regional Local Unknown

Comment:

This site is part of the Fiordland area (part of the nomination of South West New Zealand as a World Heritage site - D.O.C., 1989); the high natural values and unmodified nature of this site warrant its inclusion under international importance.

Existing Threats:

Type and Comment: cd

Johnson (1979) notes this area as having a very low deer presence and only 5 weed species including gorse present. DOC is presently maintaining a weed eradication program to keep the main invasive plant species out of area.

Human Modification and Human Use: dk

There are few modifications to this site except from deer and possum browse.

Poison Bay is a known anchorage site with low usage (Ward, Shaw, 1983). Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection:

Type and Comment: ad

This site borders on the Fiordland National Park, though this protection extends only to the mean high water mark.

Whitebaiting is prohibited in Fiordland National Park by West Coast Fisheries regulations

Availability of Information:

Natural	1	<u>2</u>	3	
Cultural	1	<u>2</u>	3	1 Well documented.
Historic	1	<u>2</u>	<u>3</u>	2 Limited information (general).
Threats	1	<u>2</u>	3	3 Little information (if any).
Human Mod. & Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	1	<u>2</u>	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	<u>1</u>	2	3	4	5	6	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

The natural values field check could be outdated.

Recorded on Existing Databases:**Comment:**

Recorded in Wetlands of national importance to fisheries, MAF.

1. WERI
2. SSWI
3. PNA - Darran Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

This area of the coast has not been surveyed for historical/archaeological sites.

References

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and Pers. Comm. (C/- P.O. MacAndrew Bay, Dunedin).
3. Wilson, G.T. 1981. Distribution and abundance of the N.Z. fur seal (*Arctocephalus forsteri*), Fisheries research Div. Occ. publ. 20.
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5. Ward, J.; Shaw, L. 1983. Fiordland coastal anchorages. (D.O.C. Te Anau.)
6. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
7. Beattie, H. 1949. The Maoris and Fiordland, and 1941 The Morioris of the South Island.
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Accompanying Maps and Photographs:

Site Name: Milford Sound and S to include Transit Beach and assoc. lagoon

Site No: 140069

Recorders Name: Simon Hayes

Conservancy: Southland

Map No/Grid Ref: NZMS 262 (SHT 14) 21030 56090

Date: 18 03 90

Brief Description of Site:

As with all the northern fiords Milford is characterised by a glacially formed classic 'U' shape with steep sea cliffs and a deep basin behind a shallow entrance formed by a morainic rock sill. The very steep cliffs of Milford (even when compared to other fiords) has resulted in them being left bare of vegetation; silver beech forest extends up to the bushline from the start of the fiord hanging valleys. It is about 16 km from the head of the fiord to the open sea. The fiord covers an area of about 25 sq. km and is 269m at its maximum depth. Two large catchment areas the Arthur and Cleddau rivers empty into the head of the fiord. The hydrology within the sheltered fiord waters is estuarine with a large fresh water runoff on the surface and a very slow deep sea water circulation underneath. The bed rock for this site is basic shist and amphibolite. Transit beach lies in a slight bay 4 km south of Milford Sound and comprises of a narrow beach 2 km long, of red and white sands, backed by forested dunes and swamps behind in the low lying north end of the beach.

Conservation Values:

Natural: abcdgh

Cultural: abcd

Historic: abc

Comment:

This is a highly natural area. The subtidal communities living on the fiord walls are unique in N.Z. and consist almost entirely of sessile suspension feeders in the depths between 5 and 40 m. The light-absorbing fresh water layer restricts algal growth and has allowed normally deep water species to become established in shallow depths. Brachiopods and black coral (*Antipathes fiordensis* - listed as threatened internationally by I.C.U.N - Wells) dominate the associations, accompanied by crinoids, sponges, bryozoa, tube worms and diverse coelenterate species. The unique and fragile nature of these communities, and their dependence on the terrestrial surroundings is of international scientific interest, Grange (1990). At the head of Milford Sound at the end of the air strip a subtidal area supports a large population of tube anemones (*Cerianthus* sp.) some of which are an undescribed species (Grange) (pers. comm.).

At the head of the sound, white heron (*Egretta alba modesta* - endangered) are known to feed in the intertidal area during winter months. N.Z. falcon (*Falco novaseelandiae* - threatened) may be breeding above the road leading to the tourist jetties. Marsh crake (*Porzana pusilla affinis*) have been recorded in small areas of jointed rush wetland around the Cleddau River delta. Variable oystercatchers (*Haemotopus unicolor* - rare) are known to breed in this area (Morrison and Kerr, 1986). Johnson (1979) records this area as the northern limit of the plant *Grammitis crassa*. Fiordland crested penguins (*Eudyptes pachyrhynchus*) have been recorded breeding around areas of scrub behind Anita Bay and at the southern end of the Transit beach (Morrison).

There is an extensive dune system both north and south of the Transit River supporting pingao (*Desmoschoenus spiralis* - a rare sand sedge) and clumps of sand spurge *Euphorbia glauca* (a vulnerable dune plant) Johnson (1979). S.I. Brown Kiwi (*Apteryx australis australis* - threatened) has been recorded in surrounding coastal vegetation. The wetland behind the dunes supports fernbird (*Bowdleria punctata punctata* - threatened regionally) and paradise shelducks (*Tadorna variegatus*). Yellowhead (*Mohoua ochrocephala* - threatened) and Brown Teal (*Anas aucklandica chlorotis* - endangered) have been recorded in the lower valley (Morrison). As an isolated land locked valley geologically, much of the coastal forest

behind Transit beach is unmodified by browsers and for this reason is of considerable scientific value (Johnson 1979).

As with all of Fiordland, this area has high aesthetic and landscape value (see the site record sheet for the outer coast of the northern Fiords). Milford holds special significance for Maori as seen by the naming of features such as Piopiotahi (Milford) named after a canoe from Hawaiki; Te Namu-a-Te-hine-nui-te-po (Sandfly Point) where Te-Hine-nui-te-po (the Great lady of Death) first liberated swarms of sandflies to remind man of his frailty and immortality; and Te No hoaka-o-Tu (Devils Armchair) on which Tu rested whilst making the fiords. (See Summary of the Maori values of Fiordland). The refuges of the legendary Lost Tribe (Patea, Hawea and Kati wairangi) extended south from here (Beattie, 1949). Traditionally Anita Bay at the mouth of Milford Sound is an important source of tangiwai or bowenite for local Maori. Historically loads of tangiwai were taken out by sea routes or by backpack over what is now the Milford Track (McGovern-Wilson, 1985). This area is also the site of a massacre by sealers in the 1820's in which the chief Hu-pokeka was shot. Although labelled as the 'hermit' of Milford Sound, Donald Sutherland played host to the first European Milford Track walkers in 1890, and built the first hotel in the area (Dept. of Lands and Survey, 1986).

Site Importance: International National Regional Local Unknown

Comment:

Being readily accessible by road Milford Sound is recognised internationally as an area of dramatic wilderness scenery, nationally as an important draw card for the tourist industry, and scientifically for the unique sub tidal communities present (Grange, 1990). Transit beach is recognised regionally for its largely unmodified habitats. As part of Fiordland National Park this area is of international importance since its inclusion in the nomination of South West New Zealand as a World Heritage Site (D.O.C., 1989).

Existing Threats:

Type: c d e i

Comment:

An effluent and sewage outfall extends from the south west side of the air strip into the head of Milford Sound. It is hoped the impact of this outfall will be reduced with the up coming Milford Re-Development Project.

Recreational fishing both by boat and by diving has depleted crayfish and fin fish stocks within the fiord (Hayes, pers. obs.) Johnson (1979) records patches of the invasive weed marram grass (*Ammophila arenaria*) on the north and south banks of the Transit River. Deer and possums both occur in coastal forests of this site (Shaw).

Human Modification and Human Use:

Type: a b d e h i k

Comment:

Areas within the head of Milford Sound are being reclaimed and the shoreline modified for extended roading and carparks to reduce overcrowding during the busy summer tourist season. A number of tourist operators run vessels for charter and scenic cruises on the sound. A number of small jetties are present in this area to provide berthage for these vessels and local rock lobster fishing boats. Approximately 10,000 people are estimated to complete the internationally acclaimed Milford Track at the head of the sound each year. Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983). Four separate outfalls from septic tanks occur at Milford; overflow from these exits into the sound.

Recreational diving has increased substantially at Milford Sound in recent years.

Existing Protection:

Type: a d

Comment:

The entire site borders on the Fiordland National Park. Under the Fisheries Act Milford Sound is excluded from commercial fishing in an effort to promote recreational fishing by tourists in the area. White baiting is also prohibited in Fiordland National Park by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	1 Well documented.
Cultural	1	<u>2</u>	3	2 Limited information (general).
Historic	<u>1</u>	<u>2</u>	3	3 Little information (if any).
Threats	1	2	<u>3</u>	
Human Mod.& Use	1	<u>2</u>	3	

Comment:**Sources of Information:**

Natural	<u>1</u>	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	1	2	3	4	5	<u>6</u>	7	5 Recent DOC survey including sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases:****Comment:**

The wetland behind Transit beach would be worthy of mention in WERI

1. WERI
2. SSWI
3. PNA - Darran Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

References

1. Grange, K.R. 1990. Unique Marine Habitats in the New Zealand Fiords: A Case for Preservation, contract report for DOC, N.Z.O.I., Wellington.
2. Grange, K.R. Pers. comm., C/o Div. Mar. & Fr. Water Science, D.S.I.R., Well.
3. Morrison, K.P. and Kerr R.D. 1986. Shorebirds of Milford Sound, Prepared for Dept. of Lands and Survey.
4. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
5. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC and pers. comm. (C/- P.O., McAndrew Bay, Dunedin
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7. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
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9. Wells, S.M. International Union for Conservation Nature and Natural resources, Red data book for Invertebrates.
10. D.O.C., 1989. Nomination of South-West New Zealand for inclusion in the World Heritage List, Govt. printer, Wellington.
11. Dept. of Lands and Survey, 1986. The Story of Fiordland National Park, Govt. Printer, Wellington.
12. Shaw, L. Pers. comm. DOC, Te Anau.

Accompanying Maps and Photographs:

Site Name: Martins Bay.

Site No: 140070

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 21120 56360

Date: 16 03 90

Description of Site:

The outer coastline is rugged and exposed in contrast to Martins Bay itself which is the largest sandy beach on the Fiordland coast. An extensive dune system backs the beach along its 6km length and is preceded by a long sand spit with dunes 6-8 m high. Because of the size of the beach, and its proximity to the coast it is very exposed to prevailing westerly winds. The wind, large effective fetch (>1000 km), and strong offshore drift greatly influence the structure and shape of the unstable sand spit. Entering the beach at the northern end, Lake McKerrow is a glacially carved fiord that no longer quite makes it to the sea, being separated from it by 3-4 km of moraines, sands and gravels.

To the north and south of the beach, rocky outcrops form the western boundaries of this site.

Martins Bay has a colourful pioneer history with early European settlement at Jamestown at the northern head of Lake McKerrow, and at the southern end of the beach.

Conservation Values: Natural:

Cultural:

Historic:

Comment:

This is a highly natural area.

Both the sand spit and beach dune areas support pingao (*Desmoschoenus spiralis* - a rare sand sedge) (Johnson, 1979). White-fronted terns (*Sterna striata*) are common in the dunes (Morrison).

McKenzie Lagoon is an important wetland habitat for banded dotterel (*Charadrius bicinctus bicinctus* - breeding), fernbirds (*Bowdleria punctata punctata* - threatened regionally), N.Z. black swan (*Cygnus atratus*), and scaup (*Aythya novaeseelandiae*) and are found here in large numbers. White herons (*Egretta alba modesta*) (endangered) have been recorded feeding in the lower reaches of McKenzie Creek. Occasional sightings of marsh crake (*Porzana pusilla affinis*) and Australasian bittern (*Botaurus stellaris poiciloptilus*) (threatened) have been recorded in the lagoon. Parakeet (*Cyanoramphus auriceps auriceps*), N.Z. falcon (*Falco novaeseelandiae* - threatened) and S.I. kaka (*Nestor meridionalis meridionalis* - regionally rare) have been recorded in surrounding coastal forest. Possibly this area is an important winter feeding site for S.I. kaka (Morrison). Giant kokopu (*Galaxias argenteus*) (a freshwater fish with indeterminate status) are recorded from this area (McEwen, 1987). There is a recorded sighting of bats (unconfirmed species - though all species are threatened) just south of Long Reef (Peacock - pers. comm.). There are unconfirmed sightings of Caspian terns (*Hydroprogne caspia*) (threatened) also in this area (Morrison).

At Long Reef there is a large rookery of breeding N.Z. fur seals (*Arctocephalus forsteri*), and breeding Fiordland crested penguins (*Eudyptes pachyrhynchus pachyrhynchus*) are also known to be present on this rocky outcrop (Wilson, 1981; Morrison).

Johnson (1979) records Martins Bay as the known southern limits of the sedge (*Baumea teretifolia*) Maori onion (*Bulbinella modesta*), and Cutte grass (*Gahnia xanthocarpa*) and the known northern limit of Muttonbird scrub (*Grachyglottis rotundifolia*).

As well as the well known aesthetic and landscape values of extensive duned beaches such as Martins Bay the area holds special significance for Maori. Martins Bay is known as Te Remu or Kotuku. From 1650 to 1800 Kotuku was a large settlement and an important food centre (notably pipis) and a famous area for

its big trees and canoe making. The area was deserted after the arrival of Europeans. Whata from here is now located in the Southland Museum. Lake McKerrow is referred to as Whakatipu-waitai (saltwater Wakatipu), as this was the area for the start of the route through to Lake Wakatipu for the collection of greenstone (Beattie, 1949). There are several unrecorded archaeological sites of Maori occupation including ovens, middens, and artefacts throughout the dune area.

Jamestown was first established in the 1870's with the first European settlers promoting the area as a new port for the West Coast. The remains of an early runholders residence - McKenzie homestead, gum trees and the old stockyards exist on the south end of the beach and this is the only evidence of early European settlement today. David Gunn (a member of the earliest European family to settle in the area) ran sheep from Big Bay and at Martins Bay long after the eventual collapse of the Jamestown settlement.

The sand spits unstable nature has probably been responsible for a number of shipwrecks in the past; notables include the 'Esther Ann' (1870) and the 'Pryde' (1864) (Peacock - pers.comm.), (Ingram, 1984).

Site Importance: International National Regional Local Unknown

Comment:

Despite the attempts at development in the past (several areas in Jamestown remain as freehold land), Martins Bays' dune system and the lagoon are largely unmodified and are of high conservation value. This area is also part of the nomination of South-West New Zealand as a World Heritage site and is therefore of international importance (D.O.C., 1989).

Existing Threats: Type: c,d

Comment:

Gorse (*Ulex europaeus*), marram grass (*Ammophila arenaria*), broom (*Cytisus scoparius*), tree lupins (*Lupinus arboreus*) and 63 other exotic weed species were recorded at Martins Bay by Johnson (1979). DOC is presently maintaining an eradication program to keep the main invasive species out of area. Johnson (1979) also noted a medium amount of deer sign and browse, and the presence of rabbits in the area.

Human Modification and Human Use: Type: hk

Comment:

Martins Bay is a popular retreat for trampers after the rigours of the 4-5 day Hollyford track. Hollyford Tours is a guiding company that offers alternate accommodation (to DOC huts) and a jet boat service up Lake McKerrow. Trout fishing is a popular pursuit in Lake McKerrow. Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983).

Existing Protection: Type: ad

Comment:

With the exception of a few small sections of freehold land, this site is bordering on the Fiordland National Park.

Whitebaiting is prohibited from Yates Point to Puysegur Point by West Coast Fisheries regulations.

Availability of Information:

Natural	1	<u>2</u>	3	1 Well documented.
Cultural	1	<u>2</u>	3	2 Limited information (general).
Historic	1	<u>2</u>	3	3 Little information (if any).
Threats	1	<u>2</u>	3	
Human Mod.& Use	1	<u>2</u>	3	

Comment:

Sources of Information:

Natural	1	<u>2</u>	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	<u>1</u>	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	<u>1</u>	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	<u>1</u>	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod.& Use	1	2	3	4	5	<u>6</u>	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Natural values field checks are probably dated.

Recorded on Existing Databases:

Comment:

McKenzie Lagoon would be worthy of a mention in WERI.

1. WERI
2. SSWI
3. PNA - Darran Ecol. Dis. 1904 National Park
4. Geopreservation
5. HPT County Inventories
6. Other
7. None

Other Considerations:

The unsurveyed Maori archaeological sites of occupation are significant and warrant detailed investigation, especially those present in the sand spit foredunes since the unstable nature of the dunes tends to make relocation very difficult.

References

- 1 Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC. and pers. comm. (C/- P.O. MacAndrew Bay, Dunedin).
- 2 Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
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- 6 Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
- 7 Beattie, H. 1949. The Maoris and Fiordland, and 1941, The Morioris of the South Island.
- 8 McEwen, M. (edt.) 1987. Ecological Regions and Districts of New Zealand, DOC.
- 9 D.O.C. 1989. Nomination of South-West New Zealand for the inclusion of the World Heritage list, Govt. Printer, Wellington.
- 10 McGovern-Wilson, R. 1985. Fiordland National Park a gazetteer of Historic and Archaeological sites, Dept of Lands and Survey, Invercargill.

Accompanying Maps and Photographs:

Site Names: Big Bay and Waiuna Lagoon

Site No: 140071

Recorders Name: Simon Hayes

Conservancy: Southland

Map/Grid Ref: NZMS 262 (SHT 14) 21200 56450

Date: 16 03 90

Brief Description of Site:

Big Bay has a wide gently sloping sandy beach, 5 km long, lying at the head of a deep bay. Sand is concentrated at the northern end of the beach, up to dunes 12 m high. Sand peters out, giving way to gravel about halfway down the beach. Although clearly influenced by a prevailing westerly wind, it is probably more sheltered than those at Barn Bay (just to the north) and Martins Bay (just to the south). The beach is backed by line upon line of parallel low dunes, the crests commonly covered in pingao and scattered *Poa* and the hollows filled with *Coprosma / flax*. This eventually leads back to a more mature forest (mixed podocarp, silver beech and kamahi). To the northern and southern boundaries of this site the coastline consists mainly of boulder or gravel beaches backed by an uplifted marine terrace leading to steep hillslopes, with a lowland podocarp covering (Johnson, 1979; McEwen, 1987).

Further inland extensive low-lying land with swamps and forests (mostly mixed podocarp, silver beech and kamahi) drains via the Waiuna Lagoon into the Awarua River, which meanders through old beach hollows to emerge at the north end of Big Bay.

Conservation Values:

Natural: a b c d e g

Cultural: a b c

Historic: b c

Comment: This is a highly natural area.

An extensive dune system along the length of Big Bay supports a large population of pingao (*Desmoschoenus spiralis*) (a rare sand sedge). Sand spurge (*Euphorbia glauca*) and Water Milfoil (*Myriophyllum robustum*) are two vulnerable plants that have also been recorded here (Johnson, 1979.)

Waiuna Lagoon is a large and important wetland habitat for a variety of waterfowl providing feeding, nesting and moulting areas. High numbers of black swans (*Cygnus atrata*), grey ducks (*Anas superciliosa superciliosa*), scaup (*Aythya novaeseelandiae*), paradise shelduck (*Tadorna variegata*) shoveler (*Anas rhynchotis variegata*) and mallard (*Anas platyrhynchos platyrhynchos*) have been observed here. Fern bird (*Bowdleria punctata punctata*) live around the margins (Weri, Coker P.M., Imboden C.).

Johnson (1979) records Big Bay as the N. limit of *Anisotome lyallii* and the S limit of *Myoporum laetum*. (Johnson, P.N. 1979; Johnson P.N.; Allen R.B.; Wardle P. 1986).

This area is also an important lowland habitat for S.I.kaka (*Nestor meridionalis meridionalis*) (rare regionally) and parakeet (*Cyanoramphus auriceps auriceps*). Brown teal (*Anas aucklandica chlorotis*) (endangered) have been recorded here in a rare sighting (Morrison K.R. & O'Donnell C.F., Dilks P.J. 1986). Giant kokopu (*Galaxias argenteus* - indeterminate status) have been recorded in Waiuna Lagoon (Davis, 1987).

There is a large glacial moraine leading back from Awarua Point towards Mt McKenzie N of the Bay. GEOPRESERVATION.

As well as the well known aesthetic and landscape values of extensive duned beaches such as Big Bay the area holds special significance for Maori. The area is the traditional home of the early Katiwairaki people. Te Hokiauau was named after a Waitaha-Hawea chief who lived in the area at an old pa. The pa may have been built at the time of Te Rauparaha's uprising in the North Island (Beattie, 1949).

There is an unrecorded Maori Burial site in the beach/dune area. There is also evidence of early European goldmine workings in this area. The planting of several macracarpa and *Pinus radiata* trees in this area also indicates early European pioneer occupation. These trees are now considered to be of historic value.

Peacock, R. (pers comm).

Site Importance: International National Regional Local Unknown

Comment:

The dune system and lagoon represent areas with a very high degree of naturalness, providing unmodified habitats for a large number of native species. Waiuna Lagoon has been included in 'Wetlands of national importance to fisheries' (Davis, 1987). As part of the nomination of South-West New Zealand as a World Heritage site this area warrants international importance (D.O.C., 1989).

Existing Threats:

Type and Comment: c d i

Gorse (*Ulex europaeus*), marram grass (*Ammophila arenaria*), broom (*Cytisus scoparius*), yellow lupins (*Lupinus arboreus*) and 39 other exotic weed species were recorded at Big Bay by Johnson (1979). DOC is presently maintaining an eradication program to keep the main invasive species out of area. Johnson (1979) also noted a medium amount of deer sign and browse, and the presence of rabbits in the area. Eel fishing is a threat to the freshwater fish values of Waiuna Lagoon (Davis, 1987).

Human Modification and Human Use:

Type and Comment: k h

Whitebaiting is a popular recreational and commercial pursuit in the lower reaches of the the Awarua River. Commercial rock lobster fishing occurs throughout the entrances to the fiords and on the outer coast (Voller, 1983). At Big Bay at least one fisherman resides permanently in the area (Peacock).

Existing Protection:

Type and Comment: a

This site borders on DOC stewardship land which was originally part of the Pyke State forest; (29718 ha) however this protection does not extend below the mean high water mark.

Availability of Information:

Natural	1	2	3	1 Well documented.
Cultural	1	2	3	2 Limited information (general).
Historic	1	2	3	3 Little information (if any).
Threats	1	2	3	
Human Mod.& Use	1	2	3	

Comment:

Sources of Information:

Natural	1	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	6	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	6	7	5 Recent DOC survey excluding and sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:**Recorded on Existing Databases:****Comment:**

1. WERI
2. SSWI
3. PNA
4. Geopreservation - draft for Southern Region.
5. HPT County Inventories
6. Other
7. None

Other Considerations:

The unsurveyed Maori archaeological sites of occupation are significant and warrant detailed investigation.

References

1. Johnson, P.N. 1979. Vegetation of Fiordland Beaches, Bot. Div. D.S.I.R. Dunedin.
2. Morrison, K.R. Map of birds observed in Fiordland National Park, held in Te Anau DOC. and pers. comm. (C/- PO, MacAndrew Bay, Dunedin).
3. Coker, P.M.; Imboden C. Wildlife values and wildlife conservation in South Westland, N.Z. Wildlife Service, Fauna Survey Unit Report No. 21.
4. Johnson, P.N.; Allen, R.B.; Wardle, P. 1986. Big Bay area Botanical Report, Bot. Div. D.S.I.R.
5. O'Donnell, C.F.; Dilks, P.J. 1986. Forest birds in South Westland. N.Z., Wildlife Service Publ No 10.
6. Davis, S.F. 1987. Wetlands of national importance to fisheries, N.Z. Freshwater Fisheries report No. 90.
7. Peacock, R. DOC Te Anau, pers. comm.
8. Voller, R.W. 1983. Fisheries. Southland Regional Planning Scheme Sect. 3 (included in the background papers).
9. McEwen, M. (edt.) 1987. Ecological Regions and Districts of New Zealand, DOC.

10. Beattie, H. 1949. *The Maoris and Fiordland, and 1941 The Maoris of the South Island.*
11. D.O.C., 1989. *Nomination of South-West New Zealand for inclusion in the World Heritage List,* Govt. printer, Wellington.

Accompanying Maps and Photographs:

Site Names: Eastern Foveaux Shelf

Site No: 14072

Recorders Name: J Hare

Conservancy: Southland

Map/Grid Ref: 46deg. 43' S 168deg. 40' E

Date: 13 March 1990

Brief Description of Site:

This site is bounded by the steep fall in depth of the Foveaux Strait shelf to the east; to the west is the arbitrary boundary between DOC Conservancies, and to the south the 12 mile limit of NZ's territorial sea. The shelf area is eastward sloping and consists predominantly of medium to fine terrigenous sand. The boundary of Foveaux Strait is determined by the fining of sediments and change of slope at about 75m depth. East of Foveaux Strait the open shelf slopes gradually downwards over 50 kilometres. The Southland current flows eastward and northward here, its principal component here is of subtropical origin; subantarctic water moves to the south and east. Water temperature tends to be lower in the district than in the Western Foveaux shelf area.

Conservation Values:**Natural:****Cultural:****Historic:****Comment:**

Little is known of this area. Communities of the molluscs *Tawera spissa* and *Diplodonta globus* are reported from the sandy sediments (King et al, 1985).

Commercial fish stocks include tarakihi, elephant fish, gurnard, red cod, trumpeter, monkfish, rig, spiny dogfish, warehou, ling, barracouta and mackerel (Ibid).

Yellow-eyed penguins which come ashore in the Waikawa area probably feed out along this shelf area, also sea birds.

Site Importance:

International

National

Regional

Local

Unknown

Comment:**Existing Threats:****Type and Comment: i**

Trawling occurs in this area (Tortell, 1981).

Discharge of ballast waters and rubbish by ships was considered to be a problem by Bluff residents who attended a public meeting with DOC in early September 1990 (pers obs).

Human Modification and Human Use: k

Human use is probably limited to fishing and to navigation by ships calling at the port of Bluff (pers obs).

Existing Protection:

Type and Comment:

None, except that this area is part of New Zealand's territorial sea.

Availability of Information:

Natural	1	2	③	
Cultural	1	2	③	1 Well documented.
Historic	1	2	③	2 Limited information (general).
Threats	1	2	③	3 Little information (if any).
Human Mod. & Use	1	2	③	

Comment:

Sources of Information:

Natural	①	2	3	4	5	6	7	1 Derived information from existing literature and databases.
Cultural	1	2	3	4	5	6	7	2 Derived information as above and field check.
Historic	1	2	3	4	5	6	7	3 Derived from existing maps and aerial photographs.
Threats	1	2	3	4	5	⑤	7	4 Recent DOC survey including sampling and analysis.
Human Mod. & Use	1	2	3	4	5	⑥	7	5 Recent DOC survey excluding sampling and analysis.
								6 Experience.
								7 Expert Opinion.

Comment:

Further search for scientific work relevant to this area is merited.

Recorded on Existing Databases: Comment:

- 1 WERI
- 2 SSWI
- 3 PNA
- 4 Geopreservation
- 5 HPT County Inventories
- 6 Other
- ⑦ None

Other Considerations:

Accompanying Maps and Photographs: