

NORTHLAND CONSERVANCY

Aupouri Peninsula Wetlands (1)

Location: 34°26'45"S, 176°43'10"E to 36°02'00"S, 173°11'55"E. On the Aupouri Peninsula north of Kaitaia to Cape Reinga, Northland, North Island. The geographical coordinates of the wetlands included in this site are given in Appendix 1.

Area: c.3,250 ha.

Altitude: Sea level to 100 m.

Overview: The Aupouri Peninsula Wetlands are a collection of lakes, ponds, swamps, dune-lands and beaches. They are the combined result of marine and aeolian influences, and are representative of these types of wetlands. The wetlands are significant because of the range of endemic and threatened species of plants and animals present, some of which are restricted to Northland. The wetlands included in this site are listed in Appendix 1. The site does not include Parengarenga Harbour, Houhora and Rangaunu Harbours and Kaimaumau Wetland, which are described separately as Site 2 (Parengarenga Harbour) and Site 3 (Muriwhenua Wetlands).

Physical features: Aupouri Peninsula is a tombolo formed of aeolian dunes of late Pleistocene-Holocene age. Most wetlands on the peninsula lie within inter-dune hollows, and some contain deposits in excess of 30,000 years old. Wetlands are predominantly fertile, with some semi-fertile bogs and a couple of oligotrophic lakes.

Ecological features: Beaches and dune lands at the mouths of some wetlands are sparsely vegetated in sedges and woody shrubs. The vegetation of the fertile swamps and lake fringes is principally sedges with a few floating aquatic herbs. This zone is replaced in some areas by a semi-fertile bog vegetation of woody shrubs, sedges and ferns.

Land tenure: Some 15% of the wetland area is Crown land held as Scenic Reserve, Recreation Reserve and Conservation area. The remainder of the wetland is private land and Maori land. Surroundings areas are a mixture of Crown land (Scenic Reserve, Recreation Reserve and Conservation area), private land and Maori land.

Conservation measures taken: Some 15% of the wetland area is under protection as Scenic Reserve, Recreation Reserve or Conservation area, managed by the Department of Conservation. The Kaitaia Environmental Trust Group are growing trees, and plan to fence off Lakes Heather and Rotorua from stock, as part of proposed planting and enhancement work.

Conservation measures proposed: A Water Management Plan is being prepared by Northland Regional Council.

Land use: Conservation of plants and animals, and recreation on the reserve areas managed by the Department of Conservation. The Aupouri Peninsula is sparsely populated with livestock grazing being the principal land use. Other activities include game-bird hunting, water-skiing, canoeing and picnicking. Exotic forestry occurs throughout the peninsula.

Possible changes in land use: Future logging could result in siltation.

Disturbances and threats: Over-grazing is a major problem when water levels are low. Recreational activities on Lake Ngatu could be a problem. The use of fertilizers in paddocks and forestry areas will result in enrichment of the wetlands. Exotic forestry elsewhere in Northland has resulted in a lowering of water tables (related to a decrease in the available groundwater).

Hydrological and biophysical values: The wetlands play a general role in the recharge and discharge of groundwater, the maintenance of water quality and the support of food chains. There has been relatively little use of the wetlands and the surrounding catchments until recently, and this has meant that the water quality of the wetlands is still high.

Social and cultural values: The Aupouri Peninsula is culturally significant to the local Maori (Te Rarawa) as a source for the cultivation and the protection of food. It also provides plants that have medicinal and craft uses. The area is subject to a land claim under the Treaty of Waitangi by the Te Rarawa people.

Noteworthy fauna: The wetlands support a number of threatened, endemic and indigenous species of waterfowl including New Zealand Dabchick *Poliiocephalus rufopectus* (40-50 birds, occurring on many lakes), Australasian Bittern *Botaurus poiciloptilus* (about 100 birds in the swamps and on lake edges), New Zealand Scaup *Aythya novaeseelandiae* (low numbers on the oligotrophic lakes), Variable Oystercatcher *Haematopus unicolor* (150 pairs), New Zealand Dotterel *Charadrius obscurus* (at least 30 pairs breeding on wetland beaches) and Banded Dotterel *C. bicinctus* (small numbers breeding on the beaches). The Banded Rail *Rallus philippensis assimilis* occurs in many of the wetlands in unknown numbers, and the North Island Fernbird *Bowdleria punctatus vealeae* occurs in some hundreds or thousands in many of the semi-fertile woody swamps. The Brown Teal *Anas aucklandica chlorotis* was recorded on one wetland in 1978, but has not been seen since.

Noteworthy flora: Four threatened endemic species of plants occur in the wetlands: *Myriophyllum robustum*, *Hydatella inconspicua*, *Ranunculus urvilleanus* and *Eleocharis neozelandica*. *Myriophyllum robustum* has been recorded at six lakes at the southern end of the peninsula. *Hydatella inconspicua*, a species now restricted to Northland, is known from three lakes in the southern peninsula. *Ranunculus urvilleanus* may occur in the southern peninsula wetlands, although it is now known to be less rare than previously thought. *Eleocharis neozelandica* grows in sandy margins of some Aupouri and Te Paki dune lakes and on some open beach seepages. Other noteworthy plants include four vulnerable indigenous species: *Cyclosorus interruptus*, *Thelypteris confluens*, *Todea barbara* and *Hibiscus diversifolius*. *Cyclosorus interruptus* and *Thelypteris confluens* are found in wetlands within the Aupouri pine forests, and *Todea barbara* has been recorded on the margins of two oligotrophic lakes. *Hibiscus diversifolius* is restricted to Northland, and is known from the Te Paki dune wetland area.

Scientific research and facilities: None.

Conservation education: The wetlands are little used for educational purposes at present, but two local (Kaitaia) environmental groups have programmes running in the southern peninsula wetlands.

Recreation and tourism: Lake Ngatu and Lake Waiparera have high recreational day use with boating, canoeing and picnicking. Lake Rotokawau has some recreational use. Most of the other lakes have very little recreational use, especially the remote ones near North Cape. Water-skiing is popular year round, and game-bird hunting occurs on most of the wetlands.

Management authority: The Department of Conservation (Northland Conservancy) has responsibility for the management of Crown land and wildlife. The Northland Regional Council has statutory responsibilities under the Resource Management Act 1991 for water resources and the preparation of coastal plans. The Northland Fish and Game Council has responsibility for the management of sport fishing and game-bird hunting.

Jurisdiction: Functional: Department of Conservation and Northland Fish and Game Council. Territorial: Northland Regional Council.

References: Ogle (1982).

Reasons for inclusion:

- 1b The Aupouri Peninsula wetlands are particularly good representative examples of common types of wetlands, including dune-formed lakes and swamps, which are relatively unmodified.
- 2a The wetland complex supports an appreciable assemblage of threatened species, including eight plant species, *Myriophyllum robustum*, *Hydatella inconspicua*,

Ranunculus urvilleanus, *Eleocharis neozelandica*, *Cyclosorus interruptus*, *Thelypteris confluens*, *Todea barbara* and *Hibiscus diversifolius*, and four bird species, *Poliiocephalus rufopectus*, *Botaurus poiciloptilus*, *Anas aucklandica* and *Charadrius obscurus*.

- 2b The wetlands support substantial populations of a variety of endemic and/or threatened plants and bird species, and are thus of special value for maintaining the genetic and ecological diversity of the region.
- 2c The wetlands are of special value as breeding habitat for waterfowl.
- 2d The wetlands are of special value for their endemic species of plants and animals, including four plants, *Myriophyllum robustum*, *Hydatella inconspicua*, *Ranunculus urvilleanus* and *Eleocharis neozelandica*, and six birds, *Poliiocephalus rufopectus*, *Anas aucklandica*, *Aythya novaeseelandiae*, *Haematopus unicolor*, *Charadrius obscurus* and *Bowdleria punctatus vealeae*.
- 3c The wetlands regularly support over 1% of the regional populations of *Poliiocephalus rufopectus* (3%), *Botaurus poiciloptilus* (8%), *Haematopus unicolor* (4.5%), *Charadrius obscurus* (4.5%) and *Bowdleria punctatus vealeae*.

Source: Richard Parrish.

Parengarenga Harbour (2)

Location: 34°31'15"S, 172°56'55"E. At the northern end of Aupouri Peninsula, 70 km north of Kaitaia, Northland, North Island.

Area: c.6,500 ha.

Altitude: 1 m below sea level to 20 m above sea level.

Overview: A large estuary containing sand flats, mangrove forest and reed-beds, and a unique large sand spit of silica sand covered in sparse indigenous plants. The area is relatively unmodified and unpolluted. Several threatened species of plants and animals are present in the wetland. The harbour is a major staging area for migratory shorebirds, at times supporting up to 20,000 birds. This wetland is not included in the Aupouri Peninsula Wetlands (Site 1) as they are primarily freshwater.

Physical features: A fluvial valley drowned by past-glacial sea-level rise (*i.e.* younger than 6500 BP). The site is banded by Pleistocene and Holocene dunes on its coastal side, and by Pleistocene dunes and Cretaceous/Miocene rock units on its landward side. Estuarine sediments are mostly sands, but mud, shell and lithic gravel are present locally.

The harbour is shallow, and has numerous long winding mangrove-lined creeks. It is dominated by the Kokota Spit which is pure white silica sand and provides a remarkable visible feature for passing tourists. Numerous streams and rivers enter the harbour, but none is of a substantial flow and all have small catchments. The tidal variation is approximately 3 metres.

Ecological features: The harbour has an extensive fringe of mangrove forest dominated by the endemic mangrove *Avicennia resinifera*. Inside the mangrove zone, there are extensive tidal sandflats mostly covered in eelgrass *Zostera novazelandica* and supporting abundant molluscs, polychaetes, anemones (*e.g.* *Anthopleura*), asteroids (*e.g.* *Patiriella*) and crustaceans. The abundant invertebrates of the Far North harbours provide a prey base for the large fish and bird populations. Shorebirds dominate the birdlife of the harbour, and for them the tidal flats are the main feeding habitat. These flats are important at various stages in the annual cycles of shorebirds: as a foraging area for off-duty nesting birds (New Zealand Dotterel *Charadrius*

obscurus and Variable Oystercatcher *Haematopus unicolor*); as a wintering area for both international and internal migratory species (the former using the harbour in the southern hemisphere summer, and the latter using it in the southern hemisphere winter); and as a staging area for birds on migration. Large numbers of northern migrants collect at the Far North harbours in the autumn before migrating to Siberia or Alaska (e.g. Ruddy Turnstone *Arenaria interpres*), while Parengarenga is the first landfall in New Zealand during the southward migration of Bar-tailed Godwit *Limosa lapponica*. High-tide roosting areas occur at many sites, but especially at Kokota Spit and in the paddocks of Paua and Steamer Point.

Kokota Spit is a very large spit by New Zealand standards, and is composed of silica sand sparsely vegetated in Pingao *Desmoschoenus spiralis*, Spinifex *Spinifex hirsutus*, Toetoe *Cortaderia splendens* and sedges.

The main wetland types and approximate area of each are as follows:

Tidal flats and channels (with eelgrass)	4,200 ha
Sand dunes	1,400 ha
Mangroves	725 ha
Saltmarsh and/or swamp	100 ha

The original plant cover of forest and scrubland in adjacent areas is now largely cleared and converted to pasture and exotic forestry (pine plantations).

Land tenure: The harbour, tidal flats and mangroves are almost entirely Crown land (Harbour Bed). Surrounding areas include: Maori land, some of which extends to mean low water; land owned by the Muriwhenua Incorporation and leased to timber companies; Crown land held as Conservation area and administered by the Department of Conservation; and alienated Crown land owned by Landcorp (a state-owned enterprise). Land on the southern side of the harbour is mainly under private ownership.

Conservation measures taken: Reserves have been established around small portions of the harbour. Parengarenga Harbour was identified as a "Site of Special Wildlife Interest" (SSWI) and ranked as "outstanding" by the Fauna Survey Unit of the New Zealand Wildlife Service. This is a nationwide wildlife habitat ranking system officially recognised by the Department of Conservation.

Conservation measures proposed: The site is being investigated for possible listing as a Ramsar Site.

Land use: Marine aquaculture (Pacific Oysters) covers about 100 ha in northern Parengarenga and has been operating for approximately 10 years. There are low levels of mainly recreational fishing for flounder and mullet. About 500 people live in the two main settlements, Te Hapua and Te Kao. Exotic forestry (pine plantations) occupies about 20% of the margins of Parengarenga Harbour, but is mainly located in the adjoining hills and at the base of Kokota Spit. Pastoral farming occurs around approximately 50% of the harbour's margin, principally on the peninsulas extending out from the western shore. Along most of the length of the harbour, shrublands provide a buffer between the mangroves and existing land management. Sand mining takes place outside the entrance to the harbour.

Possible changes in land use: There is a proposal for mullet fish-farming in the Te Kao channel, and further applications for marine aquaculture of Pacific Oysters are likely in the future. Future logging of pine plantations may result in increased siltation and run-off.

Disturbances and threats: Pollution is currently low due to the low human population; the mostly likely source is from domestic sewage. Siltation could be a problem in much of the harbour, particularly when pine plantations are logged. Observations suggest that the harbour became muddier following the clearance of surrounding shrublands in the 1970s. A loss of pines due to fire could have the same effect as logging. There is some illegal hunting of shorebirds. An exotic species of cordgrass *Spartina* sp. is growing in small patches (less than

two hectares); some of these patches have expanded quickly, but control with a view to eradication has begun.

Hydrological and biophysical values: The wetland plays a significant role in sediment trapping and the maintenance of water quality, and is of great importance in supporting aquatic and terrestrial food chains. The harbour is an important biophysical transition area. Water quality is high.

Social and cultural values: The harbour is the traditional and spiritual source of the Ngati Kuri people. It is the traditional food source of these people, and contains many "wahi tapu" (sacred places) and burial sites.

Noteworthy fauna: The harbour supports large numbers of waterbirds of various groups including herons (Ardeidae), ducks (Anatidae), rails (Rallidae), shorebirds (Charadriidae, Scolopacidae *etc.*), and gulls and terns (Laridae). Shorebirds dominate the birdlife of the harbour, and include large flocks of migratory species from the northern hemisphere, mainly Bar-tailed Godwit *Limosa lapponica* (usually about 5,000), Red Knot *Calidris canutus* (usually about 5,000), Ruddy Turnstone *Arenaria interpres* (at least 1,000) and Pacific Golden Plover *Pluvialis fulva* (500-1,000). Counts in November 1991 revealed 7,000 *Limosa lapponica* and 13,000 *Calidris canutus*.

Kokota Spit is a major breeding area for New Zealand Dotterel *Charadrius obscurus* (about 20 pairs), Variable Oystercatcher *Haematopus unicolor* (a few pairs) and White-fronted Tern *Sterna striata* (variable numbers). The harbour is a major wintering area for Black Swan *Cygnus atratus* (c.2,000), Variable Oystercatcher (c.100), New Zealand Dotterel (90-100), Banded Dotterel *Charadrius bicinctus* (1,600) and Wrybill *Anarhynchus frontalis* (c.160). The saltmarsh areas support populations of Australasian Bittern *Botaurus poiciloptilus*, Banded Rail *Rallus philippensis assimilis* and North Island Fernbird *Bowdleria punctatus vealeae*.

At least 28 species of fish have been recorded from the northern harbours, including *Mugil cephalus*, *Seriola lalandi*, *Arripis trutta*, *Chrysophrys auratus*, *Myliobatis tenuicaudatus*, *Galeorhinus australis*, *Carcharinus brachyurus*, *Epinephalus daemelli*, *Atypichthys atus*, *Notolabrus celidotus*, *Parika scaber*, *Forsterygia capito*, *Bellapiscus sp.*, *Scorpaena cardinalis*, *S. pascillosum*, *Upereichthys lineatus*, *Pempheris adspersus*, *Girella tricuspidata*, *Scorpius violaceus*, *S. lineolatus*, *Chironemus marmoratus*, *Cheilodactylus spectabilis*, *Odax pullus*, *Ruaioho whero*, *Notocliaops segmentatus* and *Parablennius laticlavus* (F. Brook, pers. comm.). Fish diversity is greater in Parengarenga than in any other of the Far North Harbours. The reefs support juveniles of subtropical species such as Spotted Black Groper *Epinephalus daemelli* and Mado *Atypichthys latus*, and are nursery areas for New Zealand species such as Paketi *Notolabrus celidotus* and Leatherjacket *Parika scaber*. Reefs and adjacent sandy areas support extremely high densities of the tripplefish *Forsterygia capito* and *Bellapiscus sp.*, attesting to the high biological productivity of the harbour. An unidentified fish that is locally common in the harbour has not been recorded elsewhere in Northland.

Molluscs include several subtropical species, *e.g.* *Natica migratoria*, *Bursa bus*, *Conus kermadecensis* and *Hydatina physis*. Parengarenga Harbour is the only area in New Zealand where the bivalve *Myochama tasmanica* occurs, and there are endemic races of the gastropods *Maurea punctulata* and *Cominella virgata* (Powell, 1979).

Noteworthy flora: Two endemic plants, *Desmoschoenus spiralis* and *Pimelia arenaria*, are found on the sand dunes. Parengarenga Harbour is possibly also a site for *Atriplex (Theleophyton) billardierei*, an indigenous species endangered in New Zealand, but this has not been checked.

Scientific research and facilities: There are no research facilities in the area.

Conservation education: Little is currently undertaken. The potential for conservation education is high, with opportunities to focus on international and internal migratory shorebirds and Maori cultural values.

Recreation and tourism: Currently at a low level. Some camping occurs (*e.g.* on Maori land at Paua), but there are no organised camping grounds. The harbour is popular for fishing, and this use is likely to increase. Commercial tourist guides operate boats from Paua. The area has very high scenic and historic interest.

Management authority: The Department of Conservation (Northland Conservancy) has responsibility for the management of Crown land and wildlife. The Northland Regional Council has statutory responsibilities under the Resource Management Act 1991 for water resources and the preparation of coastal plans.

Jurisdiction: Functional: Department of Conservation. Territorial: Northland Regional Council, Far North District Council.

References: Chapman (1978); Clunie (1987); Fanselow (1988); Foster (1975); Heinemann (1984); Ogle (1982); Powell (1979).

Reasons for inclusion:

- 1a Parengarenga Harbour is a particularly good example of a northern estuarine harbour with mangrove communities, a wetland characteristic of northern New Zealand.
- 2a The wetland supports an appreciable assemblage of threatened species, including an endemic plant *Pimelia arenaria* and three species of birds, *Botaurus poiciloptilus*, *Charadrius obscurus* and *Anarhynchus frontalis*.
- 2b The wetland supports several plants and a variety of birds, fish and molluscs which are scarce or local elsewhere in New Zealand, and is thus of special value for maintaining the genetic and ecological diversity of the region.
- 2c The wetland is of special value as the habitat of waterfowl, fish and molluscs at a critical stage in their biological cycles.
- 2d The wetland is of special value for its endemic plant and animal species, including two plants *Pimelia arenaria* and *Desmoschoenus spiralis*, and four birds, *Haematopus unicolor*, *Charadrius obscurus*, *Anarhynchus frontalis* and *Bowdleria punctatus*. It also supports endemic subspecies of the gastropods *Maurea punctulata* and *Cominella virgata*.
- 3a The harbour supports over 20,000 waterfowl, particularly when migratory shorebirds gather in the area prior to their northward migration.
- 3b The wetland regularly supports 1% or more of the regional populations of *Cygnus atratus* (2%), *Haematopus unicolor* (1%), *Charadrius obscurus* (6%), *C. bicinctus* (5%), *Anarhynchus frontalis* (4%), *Limosa lapponica* (1.5%) and *Calidris canutus* (2.5%).

Source: Richard Parrish and Ray Pierce.

Muriwhenua Wetlands (3)

Location: 34°54'15"S, 173°13'15"E to 34°56'55"S, 173°16'25"E. 18 km north of Kaitaita, Northland. The geographical coordinates of the wetlands included in this site are given in Appendix 2.

Area: c.16,500 ha (Houhora Harbour, 1,500 ha; Rangaunu Harbour, 10,000 ha; Kaimaumau Swamp and Lake Ohia, 5,000 ha).

Altitude: Sea level to 10 m.

Overview: The Muriwhenua Wetlands include two large estuaries (Houhora Harbour and Rangaunu Harbours), along with major complexes of low fertility freshwater wetlands (Kaimaumau Swamp and Lake Ohia) and more fertile wetlands (Karikari Peninsula). The

wetlands are significant because of the major concentrations of migratory waterfowl that occur there, including both international and internal migrants. Over 20,000 waterfowl may be present at times. The wetlands also support a high number of endangered endemic plants.

Physical features: The site lies in a broad, shallow valley drowned during post-glacial sea-level rise and banded by Pleistocene dune deposits and Cretary rock units. Estuarine deposits are mostly sands, but shell, mud and lithic gravel sediments are present locally.

The two estuaries are shallow and have large areas of mudflats; both have narrow entrances. The maximum depth of the harbour channels is about 10 metres. Tidal variation is about 3 metres. The Rangaunu Harbour is fed by one moderate sized river, the Awanui, which drains the Maungataniwha Range and Herekino Forest. Smaller streams feed other parts of the Rangaunu and Houhora harbours. Kaimaumau Swamp consists of a band of parallel sand dunes with swamps between; large areas are dry for much of the year. The maximum depth of the streams running through Kaimaumau Swamp is 2 metres. Lake Ohia has been drained in the past for gum-digging, and is classified as a gum-field wetland. Water is present for approximately two months of the year. The lake contains a petrified Kauri *Agathis australis* forest that was drowned 30,000 years ago.

Ecological features: The harbours have an extensive fringe of mangrove *Avicennia resinifera* forest, with that at Rangaunu Harbour being the largest mangrove forest in New Zealand. Inside the mangrove zone, there are extensive tidal sand flats mostly covered in eelgrass *Zostera novazelandica*, and extensive saltmarsh zones and sand dunes. The tidal sand flats support abundant molluscs, polychaetes, anemones (e.g. *Anthopleura* sp.), asteroids (e.g. *Patriella* sp.) and crustaceans. The abundant invertebrates of the Far North harbours provide a large prey base for the fish and bird populations.

Shorebirds dominate the birdlife of the harbours, and for them the tidal flats are the main feeding habitat. These flats are important in various stages in the annual cycles of shorebirds: as a foraging area for off-duty nesting birds (New Zealand Dotterel *Charadrius obscurus* and Variable Oystercatcher *Haematopus unicolor*); as a wintering area for both international and internal migratory species (the former using the harbour in the southern hemisphere summer, and the latter using it in the southern hemisphere winter); and as a staging area for birds on migration. Large numbers of northern migrants collect at the Far North harbours in the autumn before migrating to Siberia or Alaska (e.g. Ruddy Turnstone *Arenaria interpres*), while Parengarenga is the first landfall in New Zealand during the southward migration of Bar-tailed Godwits *Limosa lapponica*. High-tide roosting areas for shorebirds include Kowhai Beach at Houhora Harbour and Rangiputa Bank, East Beach and Karikari Peninsula paddocks at Rangaunu Harbour.

Between the two harbours and linking them is Kaimaumau Swamp. This lies behind a strip of sand dunes, and comprises a complex of extensive infertile freshwater wetlands with water-filled depressions of sedges and rushes and older dunes in woody vegetation. Kaimaumau Swamp is the largest and most outstanding Northland swamp containing representative northern swamp plants and animals. The swamp consists of oligotrophic bog vegetation, dominated by *Baumea* spp., *Schoenus brevifolius*, *Empodisma* sp., *Leptospermum scoparium* and also, along the meandering streams, Raupo *Typha* sp. Away from the main wetland areas are stands of Manuka *Leptospermum scoparium*. Open water accounts for less than 5% of the area.

The Lake Ohia wetland covers approximately 1,840 ha of peat and sand on the southeastern edge of Rangaunu Harbour (34°58'S, 173°21'E). The area of open water fluctuates seasonally with rainfall and has been modified by drainage. The vegetation of Lake Ohia is diverse and includes several threatened plant species. Waimango Swamp and Karikari Bay comprise approximately 220 ha of beach, dunes, semi-drained lagoons and large freshwater swamps lying to the northeast of Rangaunu harbour (34°51'S, 173°22'E).

The main wetland types and approximate area of each are as follows:

	Houhora	Rangaunu
Tidal flats and channels (with eelgrass)	1,050 ha	7,400 ha
Sand dunes	100 ha	100 ha
Mangroves	56 ha	2,400 ha
Saltmarsh and/or swamp	300 ha	100 ha

Land tenure: The harbours, tidal flats and mangroves are almost entirely Crown land (Harbour Bed). The remaining area is a mixture of Crown land (held as Scientific Reserve and Conservation area) and private land. Surrounding areas are a mixture of (mainly) private land, Maori land, Crown land (held as Conservation area) and land held by the Far North District Council.

Conservation measures taken: Some 20% of the area is Crown land held as Scientific Reserve and Conservation area (Kaimaumau Scientific Reserve and Lake Ohia Scientific Reserve). The possible re-flooding of Lake Ohia is currently being considered by the Department of Conservation. Rangaunu Harbour was assessed as an "Outstanding Site of Special Wildlife Interest" (SSWI) by the Fauna Survey Unit of the New Zealand Wildlife Service. This is a nation-wide wildlife habitat ranking system officially recognised by the Department of Conservation. Houhora and Lake Ohia were assessed as "high wildlife value" (Ogle, 1982).

Conservation measures proposed: The wetlands are currently being investigated for listing as a Ramsar Site. Wildlife Sanctuary status has been recommended for Walker Island in Rangaunu Harbour. Walker Island is a major high-tide roosting site for shorebirds and a breeding site of Caspian Tern *Sterna caspia*, White-fronted Tern *S. striata*, New Zealand Dotterel *Charadrius obscurus* and others species. The purpose of this proposal is to protect the roosting site.

Land use: Conservation of plants and animals on the conservation area; protection and preservation of ecological associations and plant and animal communities for scientific study, research and education and for the benefit of the country in the Scientific Reserves. Fishing in the harbours, especially for flounder and mullet. There is some small-scale commercial fishing in Rangaunu Harbour. The principal land use in surrounding areas is pastoral farming (livestock).

Possible changes in land use: A timber barging terminal is proposed for Kaimaumau, but it is not certain yet if this will proceed. There are proposals for marine aquaculture (mainly for Pacific Oysters) in Houhora Harbour. The recent sale of land held by Landcorp (a state-owned enterprise) raised concerns over the protection of conservation values in Kaimaumau Swamp. The land in question covered part of Kaimaumau Swamp and an adjoining area. Conservation concerns focus on the effect any land development would have on the adjoining swamp area. Local Maori and conservation organisations raised public concern over the sale.

Disturbances and threats: The wetlands are subject to a number of actual and potential threats. Pollution levels are currently low due to the low human population, but discharges from local dairy farms and timber treatment plants (at Rangaunu) give some cause for concern, as do discharges of domestic sewage elsewhere in the area. Fire in Kaimaumau has the potential for modifying wetland plant and animal communities. There is some illegal hunting of waterbirds. The exotic cordgrass *Spartina* sp. is growing in small patches (less than 2 ha), and some of these patches have expanded quickly, but control with a view to eradication has begun. Increased levels of marine aquaculture could reduce the area of feeding habitat for birds and cause increased levels of disturbance to birds in the surrounding areas. New oysters farms would lead to increased areas of naturalised Pacific Oysters in the harbours; they could result in increased siltation, and would create a waste disposal problem. Drainage in land surrounding Kaimaumau swamp may still influence the swamp. Human activity causes disturbance to birds

at some of the high-tide roosts, although Kowahi Beach at Houhora is little disturbed. Rangiputa Bank sustains heavy pressure from picnickers and fisherfolk during the summer.

Hydrological and biophysical values: The wetlands, particularly the harbour areas, play a significant role in sediment trapping, erosion protection and maintenance of water quality, and are of great importance in supporting aquatic and terrestrial food chains. Past drainage has removed much freshwater and brackish wetland bordering the harbours. The vegetated dunes and mangroves provide protection from coastal erosion.

Social and cultural values: The area has high traditional, spiritual and cultural values for the Ngai Takoto and Ngatikahu people. The area abounds with "wahi tapu" (sacred sites) and burial places. The area is subject to a claim under the Treaty of Waitangi (Waitangi Tribunal Claim, WAI 45).

Noteworthy fauna: The harbours can, at times, collectively support in excess of 20,000 waterfowl. The majority of these are international migratory shorebirds spending the boreal winter in New Zealand. Prominent among these international migrants are Bar-tailed Godwit *Limosa lapponica* (c.9,000), Red Knot *Calidris canutus* (c.10,000) and Ruddy Turnstone *Arenaria interpres* (c. 1,000). The harbours (especially Rangaunu) also support about 65 "wintering" Little Tern *Sterna albifrons*, the largest concentration of this international migrant in New Zealand and about 50% of the average total. Sixty-one were recorded in Rangaunu Harbour in January 1991.

Wintering populations of internal migrant and sedentary waterfowl include approximately 100 Variable Oystercatcher *Haematopus unicolor*, 100 New Zealand Dotterel *Charadrius obscurus* and 50 Wrybill *Anarhynchus frontalis*. About 60 Royal Spoonbill *Platalea regia* (15-20% of the New Zealand population) winter in the Far North harbours, with the largest proportion of these using Rangaunu Harbour. Other wintering birds include about 100 Cattle Egret *Bubulcus ibis*, a migrant from Australia, and Pacific Reef Egret *Egretta sacra*. Shags *Phalacrocorax* sp. are common, and two species breed locally.

Indigenous species breeding in the harbours include New Zealand Dotterel (at least 10 pairs), Caspian Tern *Sterna caspia* (100 pairs), White-fronted Tern *S. striata* (about 500 pairs) and Variable Oystercatcher (numbers unknown). Caspian Terns breed at both harbours, the biggest colony being on Rangiputa Bank in Rangaunu Harbour where over 200 adults and many young were present in January 1991. White-fronted Terns breed at Rangiputa Bank and feeds in both harbours.

The freshwater wetlands and brackish swamps of Kaimaumu Swamp and Lake Ohia support an unknown but substantial breeding population of Australasian Bittern *Botaurus poiciloptilus*, Banded Rail *Rallus philippensis assimilis* and North Island Fernbird *Bowdleria punctatus vealeae*. Lake Ohia is a high-tide roosting and feeding area for shorebirds from Rangaunu Harbour. Waimango Swamp and Karikari Bay are an important breeding and feeding area for the same swamp species as at Lake Ohia, plus Variable Oystercatcher, New Zealand Dotterel and Banded Dotterel *Charadrius bicinctus*. They are also a feeding area for several species of migratory shorebirds from the Arctic.

An unknown number of the endemic Black Mudfish *Neochanna diversus* occur in Kaimaumu Swamp, as does the Northland Green Gecko *Naultinus elegans* var. *grayi*. The harbours also support substantial numbers of marine fish; at least 28 species have been recorded, including *Mugil cephalus*, *Seriola lalandi*, *Arripis trutta*, *Chrysophrys auratus*, *Myliobatis tenuicaudatus*, *Galeorhinus australis*, *Carcharinus brachyurus*, *Epinephalus daemelli*, *Atypichthys atus*, *Notolabrus celidotus*, *Parika scaber*, *Forsterygia capito*, *Bellapisius* sp., *Scorpaena cardinalis*, *S. pasillosus*, *Upereichthys lineatus*, *Pempheris adpersus*, *Girella tricuspidata*, *Scorpius violaceus*, *S. lineolatus*, *Chironemus marmoratus*,

Cheilodactylus spectabilis, *Odax pullus*, *Ruaioho whero*, *Notocliaops segmentatus* and *Parablennius laticlavus* (F. Brook, pers. comm.).

Molluscs found in the harbours include several subtropical species, e.g. *Natica migratoria*, *Bursa bus*, *Conus kermadecensis* and *Hydatina physis*.

Noteworthy flora: The two harbours have large areas of the endemic mangrove *Avicennia resinifera* (also regarded as variety *resinifera* of the widespread *A. marina*), with Rangaunu Harbour having the greatest expanse in New Zealand. Dense beds of the endemic eelgrass *Zostera novazelandica* cover the tidal sand flats in both harbours, where there are also extensive areas of saltmarsh. Kaimaumau Swamp and Lake Ohia have perhaps the greatest assemblage of rare and threatened plants of any wetlands in New Zealand. The most notable include the orchids *Cryptostylis subulata* (Duckbill Orchid), *Thelymitra malvina*, *T. "ahipara"*, *Calochilus campestris* (Copper Beard), *Prasophyllum pupulum* and *Spiranthes "motutangi"*, the ferns *Thelypteris confluens* (Marsh Lady Fern), *Cyclosorus interruptus* (Marsh Fern), *Phylloglossum drumondii* and *Todea barbara* (King Fern), Club Moss *Lycopodium serpentinum*, Yellow Bladderwort *Utricularia protrusa* (now *Utricularia australis*), and the bladderwort *U. delicatula* (the largest population of this very rare species in New Zealand).

Scientific research and facilities: There are no established research facilities.

Conservation education: Little conservation education is currently undertaken, although the potential is high, with opportunities to focus on international and internal migratory waterbirds and Maori cultural values.

Recreation and tourism: Fishing is the major recreational activity. Camping and swimming are centred at Houhora Heads and Karikari Peninsula.

Management authority: The Department of Conservation (Northland Conservancy) has responsibility for the management of Crown land and wildlife. The Northland Regional Council has statutory responsibilities under the Resource Management Act 1991 for water resources and the preparation of coastal plans.

Jurisdiction: Functional: Department of Conservation. Territorial: Northland Regional Council and Far North District Council.

References: Anderson *et al.* (1984); Chapman (1978); Clunie (1988); Elliot *et al.* (1983); Ogle (1982); Powell (1979).

Reasons for inclusion:

- 1a The Muriwhenua wetlands are a particularly good representative example of estuarine harbours and swampland, wetland types characteristic of northern New Zealand.
- 2a The wetlands support an appreciable assemblage of threatened species, including three species of birds, *Botaurus poiciloptilus*, *Charadrius obscurus* and *Anarhynchus frontalis*, the Black Mudfish *Neochanna diversus*, and at least ten species of plants, *Cryptostylis subulata*, *Thelypteris confluens*, *Cyclosorus interruptus*, *Lycopodium serpentinum*, *Thelymitra malvina*, *T. "ahipara"*, *Utricularia (australis) protrusa*, *Calochilus campestris*, *Phylloglossum drumondii* and *Todea barbara*.
- 2b The wetlands support a number of plants, birds, fish and molluscs which are scarce or local elsewhere in New Zealand, and are thus of special value for maintaining the genetic and ecological diversity of the region.
- 2c The wetlands are of special value as the habitat of waterfowl, fish and molluscs at a critical stage in their biological cycles.
- 2d The wetlands are of special value for their endemic plant and animal species, notably three plants, *Thelymitra "ahipara"*, *Avicennia resinifera* and *Zostera novazelandica*, four birds, *Haematopus unicolor*, *Charadrius obscurus*, *Anarhynchus frontalis* and *Bowdleria punctatus*, and a fish, *Neochanna diversus*.
- 3a The wetlands regularly support over 20,000 waterfowl.

- 3c The wetlands regularly support 1% or more of the regional populations of at least seven species of waterfowl: *Haematopus unicolor* (1%), *Charadrius obscurus* (6.7%), *Anarhynchus frontalis* (1.3%), *Limosa lapponica* (2.7%), *Calidris canutus* (5%), *Arenaria interpres* (1%) and *Sterna caspia* (6.7%).

Source: Richard Parrish and Ray Pierce.

Whangarei Harbour (4)

Location: 35°48'00"S, 174°23'00"E. Adjacent to Whangarei City, Northland, North Island.

Area: c.12,130 ha.

Altitude: Sea level.

Overview: A large drowned river estuary with substantial areas of mudflats and mangroves *Avicennia resinifera*. Although the harbour has undergone modification, it remains important for waterfowl, supporting over 10,000 birds and substantial numbers of two threatened species.

Physical features: Whangarei Harbour is a flooded river valley estuary. Earth movements and volcanic activity also contributed to its formation. The underlying rock types are greywacke of Waipapa Group; sedimentary rocks of Cretaceous to Tertiary age overlie the greywacke in places. Over 60 soil types have been recorded around the harbour environs. The water quality downstream of Onerahi is high. The upper basin is influenced by residential, industrial and agriculture run-off. The tidal range is 2.2 to 2.9 metres, and the highest recorded tidal surge was 3.89 metres. The total catchment area is 299 sq.km. There are two main rivers, the Hatea and Mangapai Rivers, and numerous additional streams draining the catchment. The climate is temperate-subtropical, with 2,000 hours of sunshine and 1,600 mm of rain per year.

Ecological features: The harbour contains extensive areas of mangrove *Avicennia resinifera* forest extending up to 10 metres out to sea, and also saltmarsh, but brackish zones are rare as most have been reclaimed. There are extensive mudflats; these had lush beds of eelgrass beds *Zostera novazelandica* up until the late 1960s when they disappeared due, it is believed, to the discharge of over 10,000 tonnes of sediment per year by the Portland Cement Works. Other habitat types include rocky shores, rocky forested islands and low shell banks. The original, large, natural sandspit at the harbour entrance is now covered in an oil refinery and residential housing.

Land tenure: Crown land (Harbour Bed), land owned by the Port Company, and land owned by Northland Regional Council. Surrounding areas are under mixed ownership, including private land, Maori land, land owned by Northland Regional Council and Crown land.

Conservation measures taken: About 80% of the wetland area was declared a Wildlife Refuge in 1962 under the Wildlife Act of 1953. Wildlife Refuge status prohibits hunting and deliberate disturbance to wildlife, but does not restrict public access. It is an overlying status which does not affect the title of the land. The value of the harbour is recognised in Whangarei District Council District Scheme.

Conservation measures proposed: Parrish (1984) and Northland Harbour Board (1988) have recommended extension of the Wildlife Refuge to cover the rest of the harbour, but this has not as yet been implemented. Limestone Island is currently being "restored" by local conservation organisations and Whangarei District Council.

Land use: Protection of wildlife in the Wildlife Refuge, and industrial uses on or adjoining the wetland, such as an oil refinery, cement works and port facilities. There is a small commercial fishery and a recreational fishery. A small amount of oyster farming takes place, and there is

some grazing by domestic livestock. The latter can be quite damaging to mangrove and saltmarsh areas. Surrounding areas are used for industry, residential areas, horticulture, forestry and pastoral farming (grazing). A part of the adjoining catchment is used for residential water supply. The human population is about 50,000, with the city of Whangarei adjacent to the wetland.

Possible changes in land use: An extension of port facilities for forest products has been proposed. This would involve the reclamation of 35 ha of wetland. Reclamation would destroy valuable feeding areas for waterfowl and alter water flows, and may present an additional source of pollution in the form of tree bark.

Disturbances and threats: Siltation and pollution have caused serious problems in the past, but the situation is improving. Over 300 ha of the harbour have already been reclaimed; this activity is now limited, but the proposal for a forestry port would result in a further 35 ha being reclaimed. There is a potential threat of pollution from oil spills. Recreational use and levels of disturbance are high and increasing. The fringes of the harbour are unfenced, and cattle encroach into mangrove and saltmarsh areas.

Hydrological and biophysical values: The wetland plays a general role in flood control, sediment trapping and maintenance of water quality, and is of importance in supporting aquatic and terrestrial food chains. Due to the narrow harbour entrance, it takes approximately three weeks for total flushing of the harbour to occur. Above Onerahi, the discharge of urban and industrial effluents and domestic sewage means that water quality is not high, despite the fact that sewage disposal has now been improved. In spite of the human-induced lower water qualities, the harbour still supports large numbers of waterfowl.

Social and cultural values: The site abounds with "wahi tapu" (sacred places) and burial sites. The wetlands are a traditional nursery area for food sources; the Maori actively managed their food resources, and were known to seed areas with shell fish.

Noteworthy fauna: At times, the harbour supports over 10,000 waterfowl including up to 5,500 Bar-tailed Godwit *Limosa lapponica baueri*, 5,500 Red Knot *Calidris canutus*, 3,000 South Island Pied Oystercatcher *Haematopus finschi*, 300-400 Banded Dotterel *Charadrius bicinctus*, 150 Wrybill *Anarhynchus frontalis*, 40 New Zealand Dotterel *Charadrius obscurus* and small numbers of Royal Spoonbill *Platalea regia* (a rare species in New Zealand). Breeding birds include Pacific Reef Egret *Egretta sacra*, Banded Rail *Rallus philippensis assimilis*, Variable Oystercatcher *Haematopus unicolor* (2-3 pairs), New Zealand Dotterel *Charadrius obscurus* (1-3 pairs), Red-billed gull *Larus scopulinus* and Caspian Tern *Sterna caspia*. A small population of about 20 North Island Fernbirds *Bowdleria punctatus vealeae* breeds in the saltmarsh.

Noteworthy flora: The harbour contains a good example of mangrove forest dominated by the endemic species *Avicennia resinifera*. This is one of the most extensive mangrove systems in New Zealand.

Scientific research and facilities: There are no special facilities at the wetland as Whangarei city is adjacent to the harbour. Past research has included studies of the sediments and hydraulics (Black, 1983; Millar, 1980) and marine ecology (Mason & Ritchie, 1979).

Conservation education: Because of the large population surrounding the Harbour, this is a prime area for conservation education. Available facilities include an interpretive gazebo and mangrove walkway at Kioreroa Road. Education activities are undertaken particularly with students from Whangarei Boys High School and Kamo High School. There is considerable potential for further conservation education.

Recreation and tourism: Whangarei Harbour is a port of call for overseas yachts. There is high local use for recreational activities which include fishing, shellfish gathering, yachting, sail-boarding, motor-boating, rowing, game-bird hunting, bird-watching, swimming and diving.

Management authority: The Department of Conservation (Northland Conservancy) has responsibility for the management of Crown land and wildlife. The Northland Regional Council has statutory responsibilities under the Resource Management Act 1991 for water resources and the preparation of coastal plans. The Northland Fish and Game Council has responsibility for the management of sport fishing and game-bird hunting.

Jurisdiction: Functional: Department of Conservation and Northland Fish and Game Council. Territorial: Northland Regional Council and Whangarei District Council.

References: Black (1983); Mason & Ritchie (1979); Northland Harbour Board (1988); Ogle (1982); Parrish (1984).

Reasons for inclusion:

- 1a Whangarei Harbour is a particularly good representative example of a mangrove-dominated estuarine system, a wetland type characteristic of northern New Zealand.
- 2a The harbour regularly supports appreciable numbers of at least two threatened species of birds, *Charadrius obscurus* and *Anarhynchus frontalis*.
- 2b The wetland supports one of the most extensive mangrove systems in New Zealand, as well as substantial populations of a variety of endemic and/or threatened bird species, and is thus of special value for maintaining the genetic and ecological diversity of the region.
- 2c The wetland is of special value as breeding habitat for waterfowl.
- 2d The wetland is of special value for its endemic plant and animal species, including the mangrove *Avicennia resinifera* and at least four species of birds, *Haematopus unicolor*, *Charadrius obscurus*, *Anarhynchus frontalis* and *Bowdleria punctatus*.
- 3c The wetland regularly supports 1% or more of the regional populations of *Haematopus finschi* (3%), *Charadrius obscurus* (3%), *C. bicinctus* (1%), *Anarhynchus frontalis* (3%), *Limosa lapponica* (2%) and *Calidris canutus* (3%).

Source: Richard Parrish.

Pouto Peninsula Wetlands (5)

Location: 36°19'55"S, 174°02'10"E to 36°19'40"S, 174°07'15"E. On Pouto Peninsula (the northern peninsula of Kaipara Harbour), 45 km southwest of Dargaville, Northland, North Island. The geographical coordinates of the wetlands included in this site are given in Appendix 3.

Area: c.6,000 ha.

Altitude: Sea level to 30 m.

Overview: A complex of 22 freshwater sand dune lakes and swamps, dunes, ocean beach and shrublands; the best example of this habitat type in New Zealand. The wetlands support a wide range of species, many of which are threatened.

Physical features: The wetlands are situated in a region of consolidated Pleistocene sand dunes with more recent Holocene dunes near the coast which are stable though unconsolidated. Most wetlands have formed within basins in the Pleistocene dunes, except Lakes Humuhumu, Kanono and Kahuparere which are between the older and newer dunes. Lake Humuhumu, with a maximum depth of 16 m, is the deepest lake. The lakes receive most of their water from precipitation and groundwater. The recent dunes consist of Pinaki sands, which are now low in nutrients. The consolidated dunes are Redhill sandy loams. Flat peaty areas are Parore peaty

sandy loams. Average daily temperatures range from 10.7°C in July to 19°C in February; the annual rainfall averages 1,100 mm, and the number of hours of sunshine 2,000.

Ecological features: Habitats include: hard sandy beaches exposed at low tide, some 100-300 m wide; low sparsely vegetated dunes with *Spinifex Spinifex hirsutus* and Pingao *Desmoschoenus spiralis*; seasonally flooded dune slacks (depressions); and lakes with swamp fringes and inter-connecting swampy arms with Jointed Wire Rush *Leptocarpus similis*, Jointed Twig Rush *Baumea articulata*, *Typha orientalis*, *Scirpus lacustris* and *Eleocharis sphacelata*. There is a relatively small area of infertile swamp of *Baumea rubiginosa*, *Schoenus* sp. and Manuka *Leptospermum scoparium*. The eastern peninsula lakes have grasses extending to the lake edge. The unconsolidated dunes support a denser vegetation of Toetoe *Cortaderia toetoe*, *Isolepis nodosa*, *Coprosma acerosa*, *Cassinia leptophylla*, *Muehlenbeckia complexa* and exotic plants including marram grass, pampas grass and lupin. There are also some areas of Manuka and Kanuka shrubland.

Land tenure: About 50% of the wetland is Crown land held as conservation area, and the remainder is private land and Maori land. Surrounding areas include private land, Maori land and Crown land. Both the wetland and the surrounding area are under Treaty of Waitangi claims.

Conservation measures taken: Approximately 50% of the wetland is under protection as conservation area. A Wildlife Refuge (declared in 1957 under the Wildlife Act 1953) extends over some of the conservation area as well as approximately 170 ha of private land. "Wildlife Refuge" is an overlying status over the land that does not affect the tenure of the land.

Conservation measures proposed: A Water Management Plan for Pouto Lakes is being prepared by the Northland Regional Council.

Land use: Conservation of plants and animals on the conservation area and protection of wildlife in the Wildlife Refuge. Domestic livestock have access to most of the water areas. The lakes are used as a water supply for livestock and horticultural purposes. Livestock grazing occurs around the wetlands, and there are extensive areas of exotic forestry nearby. Fishing occurs at a low level, and there is some hunting of pigs and game-birds.

Possible changes in land use: None known at the wetlands. Forestry activities in other areas (e.g. South Kaipara and Aupouri) have lowered water levels and resulted in the drainage of some wetlands.

Disturbances and threats: Ongoing over-grazing is a threat to some wetlands on the eastern side. Nutrient enrichment from fertilisers and animal waste is also a problem in eastern areas. There is a possibility that recently planted and older pine trees will lower the water table as they mature, as has happened elsewhere. Applications for water extraction are increasing.

Hydrological and biophysical values: All the wetlands are dependent on precipitation for maintaining water levels. Pastoral farming and horticulture are dependent on water the wetlands provide. The wetlands support food chains that end in a number of threatened species of fish and birds.

Social and cultural values: The wetlands are important to the Ngati Whatua people. There are many archaeological sites such as middens and "wahi tapu" (sacred places) in the area, and there is an historic lighthouse at North Kaipara. The area is popular for outdoor recreation.

Noteworthy fauna: The wetlands support substantial breeding populations of several species of birds and fish which have declined substantially elsewhere in New Zealand. Noteworthy birds include New Zealand Dabchick *Poliocephalus rufopectus* (approximately 130 birds), Australasian Bittern *Botaurus poiciloptilus* (the wetlands are a stronghold for this species in Northland), Pacific Reef Egret *Egretta sacra* (rare in this habitat type), Brown Teal *Anas aucklandica chlorotis* (last recorded in 1977/78), New Zealand Scaup *Aythya novaeseelandiae* (rare in Northland), Banded Rail *Rallus philippensis assimilis* (rare in this habitat), Marsh Crake *Porzana pusilla* (one record), Variable Oystercatcher *Haematopus unicolor* (a few

breeding pairs), New Zealand Dotterel *Charadrius obscurus* (maximum count 59) and North Island Fernbird *Bowdleria punctata vealeae*.

Notable fish include the endangered and endemic Dwarf Inanga *Galaxias gracilis*, which occurs in only seven lakes.

Noteworthy flora: The wetlands support an association of plants which are special to this type of habitat and are now extremely rare and restricted to a few sites on the west coast of Northland. Notable species include the Marsh Fern *Thelypteris confluens* (in dense swamps), *Pseudopanex ferox* (in shrublands), Pingao *Desmoschaenus spiralis* (on the fore-dunes), *Hydatella inconspicua* (in water less than 1.5 m deep) and *Hebe cf diosmifolia* (in shrubland and forest).

Scientific research and facilities: Hydrological, chemical, archaeological, botanical and ornithological studies have been carried out in the area. Various organisations have been involved, including the Ministry of Agriculture and Fisheries, the Department of Conservation, the Northland Regional Council, the Ornithological Society of New Zealand and various universities. There are no special research facilities.

Conservation education: Little conservation education is currently undertaken, although the potential is high, with opportunities to focus on freshwater fish and endemic birds. There is an outdoor education camp at Pouto which could be used for developing such programmes.

Recreation and tourism: Activities include fishing and bird-watching. Duck hunting occurs on privately owned wetlands, and there is one four-wheel drive tourist operation. Recreational use is likely to increase with the construction of a new wharf at Pouto.

Management authority: The Department of Conservation (Northland Conservancy) has responsibility for the management of Crown land and wildlife. The Northland Regional Council has statutory responsibilities under the Resource Management Act 1991 for water resources and the preparation of coastal plans. The Northland Fish and Game Council manages sport fishing (trout and salmon) and game-bird hunting.

Jurisdiction: Functional: Department of Conservation and Northland Fish and Game Council. Territorial: Northland Regional Council and Kaipara District Council.

References: Australian Journal of Marine/Freshwater Research Vol. 4, No.2: 343-386; Breviora (1967); Department of Lands and Survey (1981a); Historic Places Trust (1982); Northland Regional Council; New Zealand Journal of Botany 1980 Vol. 4:343-386; Ogle (1982); Tanner *et al.* (1986).

Reasons for inclusion:

- 1a The Poutu Peninsula wetlands are particularly good representative examples of freshwater sand dune lakes and swamps, wetlands characteristic of northern New Zealand.
- 2a The wetland complex supports an appreciable assemblage of threatened species, including at least three species of plants, *Thelypteris confluens*, *Hydatella inconspicua* and *Desmoschaenus spiralis*, four species of birds, *Poliiocephalus rufopectus*, *Botaurus poiciloptilus*, *Anas aucklandica* and *Charadrius obscurus*, and one species of fish *Galaxias gracilis*.
- 2b The wetlands support a number of plants, birds and fish which are scarce or local elsewhere in New Zealand, and are thus of special value for maintaining the genetic and ecological diversity of the region.
- 2c The wetlands are of special value as the habitat of waterfowl at a critical stage in their biological cycles.
- 2d The wetlands are of special value for their endemic plant and animal species, including four plants, *Pseudopanex ferox*, *Desmoschaenus spiralis*, *Hydatella inconspicua* and *Hebe cf diosmifolia*, six birds, *Poliiocephalus rufopectus*, *Anas aucklandica*, *Aythya*

novaeseelandiae, *Haematopus unicolor*, *Charadrius obscurus* and *Bowdleria punctata*, and the fish *Galaxias gracilis*.

3c The wetlands regularly support over 1% the regional populations of *Poliiocephalus rufopectus* (9%) and *Charadrius obscurus* (4%).

Source: Richard Parrish.
