

Waikato regional marine oil spill contingency plan 2021 to 2024

Volume 2 of 2 – Reference document - sensitive areas and coastal information

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Abstract

This document is used in conjunction with document # 18181776, Waikato Regional Marine Oil Spill Contingency Plan 2021 - 2024 Volume 1 of 2 – Operational arrangements.

The purpose of this document is to provide a Regional on Scene Commander and oiled wildlife response staff, who are responding to a marine oil spill in the Waikato Region, with a preliminary understanding of risks to wildlife, flora and fauna.

This document provides and describes the values and activities that require protection within each area, access to the areas, communications, preferred response options and restrictions on options.

The information in this document should be supplemented by local knowledge, contemporaneous expertise, ground truthing and verification at the time of response.

Annex 4 Sensitive areas and coastal information

1 Risk

1.1 Risk assessment

It is anticipated that:

- The probability of a diesel spill from coastal shipping is low;
- The probability of a diesel spill is highest at the diesel refuelling sites: Coromandel, Whitianga (Marina), Whangamata (Marina), Whangapoua, Tairua, Raglan, Kawhia and at the truck bunkering sites at Te Kouma.
- There is a moderate risk of a medium size spill happening as a result of a truck tanker accident.
- There is a low risk of a major spill at Port Taharoa. Any mishap on this coast at this site however has the potential for far reaching impact
- The probability of a spillage of heavier fuel oil from coastal shipping, including the Western Seaboard is low.
- As the region is located between the Ports of Auckland and Tauranga, ship traffic around the Coromandel is very high. Hence, although the probability of a spill from coastal shipping is low, the most likely area to be impacted would be the Coromandel Peninsula / Firth of Thames.
- A considerable number of coastal ships use the "hole in the wall" - a shipping lane that passes inside Cuvier Island and both the Mercury and Alderman Island groups and either inside or outside of the Ohinau group. There are a number of islands, islets and rocks covered and uncovered in this zone. This would be the single most vulnerable and likely site on the Coromandel Coast for a serious large vessel spill. These Islands generally are predator free and have high densities of burrowing seabirds many of whom raft up at sea within the area during daylight. This is also the site of the only Marine Reserve on the peninsula.
- There is low risk of major spill emanating from the Pohokura and Maari Fields impacting on the west coast.

1.2 Oil Transfer Sites (Tier 1 responses)

There are currently 14 Oil Transfer Sites with Marine Oil Spill Contingency Plans (OTSMOSCP's). Those plans detail procedures should there be an oil spill to the marine environment at those facilities in the Waikato Region. These plans focus on a Tier 1 response and escalation to ROSC if necessary. The associated plans and related correspondence have the file number 31 50 04. This information can be found in WebEOC under the tab: Regions>Oil Transfer Sites.

Mobile refuellers must list and confine refuelling activity to those sites. Risk assessment and approval is carried out on a site specific basis – not on a region wide basis.

A Tier 2 response is not necessarily simply recognised as being oil entering the Coastal Marine Area (CMA). It can include the threat of oil 'actually' entering the CMA from freshwater environments and/or the 'potential' for such.

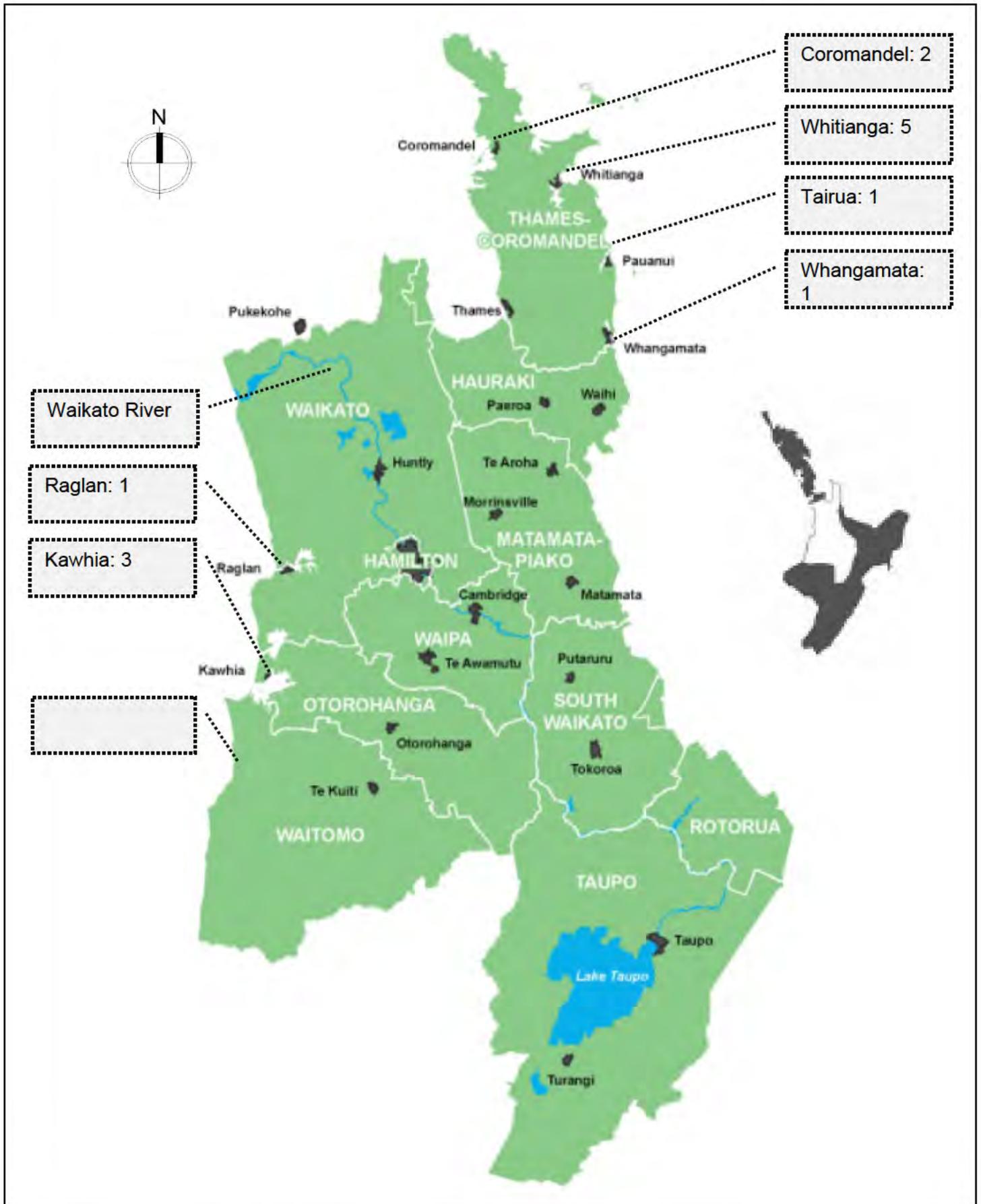


Figure 1 Oil Transfer Site facilities and number of commercial operators in the Waikato region

1.3 West Coast

It is important that before launching an oil spill response on the West Coast contact is made with Port Taharoa Harbourmaster (contact details in volume 1). The Harbour Master for Port Taharoa is appointed by Maritime NZ. They undertake sand-transfer activities out of Taharoa. On many occasions a report has come in where someone flying over the area has mistaken these activities for an oil spill. A picture taken during the resulting fly-over is included below for reference.



Figure 2 Port Taharoa sand dredging operations

1.4 Shipping routes

The ships that use the coastline of the Waikato Region pose an oil spill threat of low probability of occurrence but high potential impact on the environment. The majority of vessel activity in New Zealand is concentrated on the East Coast due to the locality of the major ports. Tanker movement around the northwest coast of the North Island has been estimated at about 120 movements in either direction per year (Woodward-Clyde (New Zealand) Ltd, 1998).

1.4.1 Coastal shipping routes

There are various methods for identifying vessels that may be responsible for an illegal oil discharge. Ships logs or onboard electronic devices such as GPS should provide details of navigation routes. Port authorities also track arrivals and departures of vessels and marine radio transmissions can provide important information as to a vessels movement. Vessels can also be tracked using AIS (Automatic Identification System) through the <http://www.marinetraffic.com/ais/> website. MNZ also has access to a google earth based system which shows the location of AIS enabled vessels.

2 General environmental information

Information contained within this report may be out of date at the timing of reading. It is recommended to view WRC 'OurMaps' for current environmental information and contact WRC Coastal Science team members.

In order to provide for effective response to a marine oil spill, it is important to supply the Regional on Scene Commander and the Advisory Team with as much information as possible about coastal areas. This section describes the values that require protection within each area, access to the areas, communications, preferred response options and restrictions on options.

Ideally, the entire foreshore in the Waikato would be protected in the event of an oil spill occurring in the New Zealand Marine and Internal Waters. In reality however, resources available to respond to a spill are limited and it is not always possible to protect all areas. Hence, it is necessary to prioritise areas in terms of their sensitivity to oil spills and the likelihood they will be exposed to a spill.

Waikato Regional Council has identified several priority sites in the CMA that require priority protection from oil spills. These areas were selected and highlighted as areas of significant conservation value in the Regional Coastal Plan. The sites were identified by Waikato Regional Council, Iwi, and the Department of Conservation using the Coastal Resources Inventory, field surveys, aerial photographs, site inspections, databases and published reports.

Further to this Waikato Regional Council recognises the importance of working with The Department of Conservation to protect reserve areas. These areas are identified in this Annex, and will be considered the second priority for protection behind the ASCV sites. Waikato Regional Council also acknowledges the economic importance of marine farming to members of the coastal community. This Annex also contains maps of marine farm locations. In an oil spill event staff involved in a Tier 2 response will attempt to notify potentially affected farms, however as the farms are not a natural part of the coastal ecosystem the importance and priority to protect the farms will be below both the ASCV sites and DoC's reserves.

The Department of Conservation have determined, taking into account the high volume of ship traffic around the Coromandel and the species present, that in the event of a widespread oil spill, some of the Priority Areas for Protection should be given higher priority than the remaining areas.

The following is a summary of the species likely to be impacted in each Priority Area for Protection. The higher priority areas have been separated from the remainder of the Areas. For a more detailed description of each area refer to the Site Sheets contained in this Annex or Appendix IV of the Regional Coastal Plan. In the event of an oil spill the following groups should be consulted with before using dispersant: Local councils, iwi, Massey wildlife group, Department of Conservation, Coastal care groups.

2.1 Species specific priority list (holistic index S4 & 5)

Location (higher priority)	Species likely to be impacted
Firth of Thames (NB: Internationally important wetland (Maritime NZR site).	Vast numbers (>40,000) national and international migratory waders. 74 species of shorebird, waders and waterfowl frequent or live in the Firth. Birds are present year around, with Arctic migrant's onsite Sept-March. Significant schools of common dolphin frequent this area.
Mercury Island Group and Cuvier Island	Significant colonies of burrowing seabirds, rare and threatened sea and coastal bird species.
Ohinau Island Group	Significant colonies of seabirds
Alderman Island Group	Significant colonies of burrowing seabirds, rare and threatened sea and coastal bird species. Frequented by NZ fur seals. A New Zealand fur seal haul out area.
Location (remaining priority areas for protection)	Species likely to be impacted
Mokau River estuary	15 coastal/wetland (wading) bird species, including threatened reef heron, NZ dotterel and the rare variable oystercatcher.
Marokopa estuary	12 species of coastal and wading bird species, including threatened reef heron, banded rail, NZ dotterel, and caspian tern.
Albatross Point	NZ fur seal haul out site. NZ fur seal haul out area, Tirua Point south of Albatross Point.
Kawhia Harbour	International and national waders, shore and wetland bird fauna (includes: NZ dotterel, banded dotterel, caspian tern, variable oystercatcher, reef heron, white heron and royal spoonbill, SI pied oystercatcher, bartailed godwits, turnstones, black stilt, occasionally far Eastern curlews, Asiatic whimbreds)
Aotea Harbour	International and national waders and coastal birds (includes: NZ Dotterel, caspian tern, reef heron, variable oystercatcher, SI pied oystercatchers, bartailed godwits)
Gannet Island	Significant seabird nesting colony Australasian Gannet (20,000+ November - February) Haul out and breeding site NZ fur seals (up to 200 / annum)
Raglan Harbour	International and national waders and coastal birds (includes: banded rail, caspian tern, reef heron, royal spoonbill, white heron, SI pied oystercatcher, bartailed godwits, variable oystercatcher, NZ dotterel, banded dotterel)
Waikato River Mouth and Estuary	Resident and frequenting rare and threatened wading and coastal birds (up to 31 species, including: breeding populations of NZ dotterel, caspian tern, variable oystercatcher, white fronted tern; visiting banded dotterel, reef heron, wrybill, black stilt, white heron). Up to 20,000 waterfowl use this area seasonally (autumn, winter).
Port Waikato to Raglan Harbour	Maui dolphin (see Scope of wildlife response)
Manaia Harbour	Resident and frequenting rare and threatened wading and coastal birds (includes: variable oystercatcher, NZ dotterel, banded dotterel, caspian tern).

Inner Coromandel Harbour	Resident rare and threatened waders and coastal bird species (includes: NZ dotterel, caspian tern, white fronted tern, possibly variable oystercatcher)
Location (remaining priority areas for protection)	Species likely to be impacted
Colville Bay	Resident and frequenting threatened and rare waders, coastal and freshwater bird species (includes: NZ dotterel, reef heron, caspian tern, banded rail, variable oystercatcher). Significant pateke (brown teal) flock site at rivermouth, north-east corner of Whangaahei Bay. Banded rail. Bittern.
Cape Colville to Sandy Bay	Resident rare and threatened wading and coastal bird species
Waikawau Bay and estuary	Resident and frequenting rare and threatened wading and coastal bird species (includes: NZ dotterel, banded dotterel, variable oystercatcher)
Whangapoua Harbour	Resident and frequenting rare and threatened wading, coastal and freshwater bird species (includes: NZ dotterel, reef heron, caspian tern, variable oystercatcher, banded dotterel, bar-tailed godwit.
Whitianga Harbour	Resident and frequenting rare and threatened wading, coastal and freshwater bird species (includes: reef heron, caspian tern, variable oystercatcher, NZ dotterel, pied and little shags)
Opoutere Sandspit and Wharekawa Harbour	Resident and frequenting rare and threatened waders and coastal bird species (includes: largest breeding site NZ dotterel, variable oystercatcher, banded rail, bittern)
Whangamata Harbour	Resident and frequenting rare and threatened waders and coastal bird species (includes: reef heron, caspian tern, variable oystercatcher, NZ dotterel, banded dotterel, banded rail, fernbird)
Otahu estuary	Resident and frequenting rare and threatened wading, coastal and freshwater bird species (includes: caspian tern, banded rail, fern bird and bittern)
Clark Island group	Seabirds

Wading species are likely to be impacted indirectly through interruption of the food chain. Other species such as waterfowl, herons, shags, gulls and terns are likely to be directly impacted through contact with the oil.

2.2 Ngāti Porou ki Hauraki Marine and Coastal Area Plan

<https://discover.wairc.govt.nz/otcs/llisapi.dll?func=ll&objaction=overview&objid=6289839>

2.3 Historic Ngāti Porou ki Hauraki Context

<https://discover.wairc.govt.nz/otcs/llisapi.dll?func=ll&objaction=overview&objid=6291678>

3 Scope of wildlife response

Birdlife

The scale of wildlife casualties for spill will be dictated entirely by the biogeography and life history of wildlife in the area affected by the spill. This notwithstanding, the wildlife response capability planned for herein is for the ongoing care of up to 50 seabirds including their re-release into an oil-free environment, close to their point of capture.

Larger numbers of birds, birds with specific treatment or husbandry requirements, or species other than birds may be affected; response to such an event may require resources outside the scope of this response plan. As the response would likely at that stage become a national one.

NZ sealion, southern elephant seal or full-grown NZ fur seals

It is recommended that NZ Sealion, Southern elephant seal or full-grown NZ fur seals (over eighteen months of age) are not captured for safety reasons. This includes physical injury from handling the animals and the risk of infection from bites. Even with sub-adult NZ fur seals, any person handling these animals should be experienced in seal handling. Other responses including hazing and euthanasia may be deemed appropriate.

Maui dolphin

The rare Maui Dolphin (formally known as the North Island Hector's Dolphin) is found off our West Coast, and would be of greatest concern from a Department of Conservation point of view during a response. The following points come from Richard Norman a Senior Lecturer in Wildlife Health at Massey University and can be applied to all toothed whales and dolphins.

- The most likely impact would be via habitat degradation and by disturbance from response actions, rather than any effects of the oil itself.
- They are relatively unaffected by petroleum except if there are heavy concentrations of volatile fractions, or if frank oil is ingested (such as on prey items, or contaminated play objects).
- Their skin is relatively resistant to exposure, though their conjunctiva and mucous membranes are sensitive.
- Some dolphins have been observed to avoid oil slicks, while others appear to seek them out apparently to play in them.
- Indirect habitat effects such as decreased availability of prey species and reduced water visibility impacting hunting success are suggested effects.
- The most likely negative effects are boat traffic disturbing normal behaviour and hunting, and possible increased risk of boat/propellor strike if traffic is increased locally.
- The above could be balanced by a local fishing ban enforced on the basis of fish contamination reducing the risk of set net bycatch which has been a problem in other subpopulations

Further to this Georgia-Rose Travis a PhD student at Lincoln University studying Dolphins, suggests that the oil will affect their ultrasound. The effects being trouble feeding and travelling. She is aware of an incident in Mexico that caused a lot of Dolphins to die and also says that she would expect the oil to stay in their systems long-term, potentially affecting reproduction. She provided a number of references that are saved in Doc # 825382.

3.1 Individual species index

3.1.1 Category 1 first priority for deterrence, rescue and rehabilitation

Name *Most likely encountered	Breeding season	Genus species
Wandering albatross	Lays eggs Dec – Feb. Hatch Mar – April. Fledge Nov – Feb. Breeds every 2nd yr.	Diomedea exulans
Black petrel	Lays eggs in Nov. Chicks fledge late Jan – Feb. Migrate to south America for winter	Procellaria parkinsoni
Grey petrel	Breeds Feb – Nov. Summer and Autumn immature birds move to the east coast of North Is	Procellaria cinerea
*Pycroft's petrel	Breeds Oct – Mar. Breeds on islands close to the east coast ie Mercury Is. Migrates to northern Pacific. Endemic to the Hauraki Gulf	Pterodroma pycrofti
NZ Storm Petrel	While there is very little known about this species - it is found only in the Hauraki Gulf in some numbers and believed to be breeding in the same. Generally found around January – April.	
Brown teal	Breeds July – Nov. Mainly in estuarine environment	Anas aucklandica
Black stilt	Mainly found in inland South Island	Himantopus novaezelandiae
*New Zealand dotterel	Breeds Sept – Mar. Significant breeding sites all along the Coromandel peninsular on sandy beaches	Charadrius obscurus
Shore plover	Breeds Nov – Feb. Not normally found on Coromandel.	Thinornis novaeseelandiae
Fairy tern	Not normally found in Coromandel. Kaipara and just south of Whangarei are its breeding grounds	Sterna nereis
Leathery turtle	Not common in NZ but range does include most of NZ	Dermochelys coriacea
Green turtle	Not common in NZ and range only in the far north of NZ	Chelonia mydas

3.1.2 Category 2: Second priority for deterrence, rescue and rehabilitation

Name		<i>Genus species</i>
Shy mollymawk	Range: sub-antarctic	<i>Diomedea cauta</i>
Black-browed mollymawk	Off shore island bird	<i>Diomedea melanophrys</i>
Bullers shearwater	Breeds on the Poor Knights	<i>Puffinus bulleri</i>
White-faced storm petrel	This small petrel breeds only on rat-free islands. Can be confused with the Grey Face Petrel which is larger.	<i>Pelagodroma marina</i>
*Blue penguin	Very common all along coastline. Variable breeding season but mainly Sept - Nov	<i>Eudyptula minor</i>
Reef heron	Significant populations occur in the Waikato region, particularly Coromandel Peninsula. Breeds Sept – Jan.	<i>Egretta sacra</i>
White heron	South Island bird	<i>Egretta alba</i>
Royal spoonbill	South Island bird	<i>Platalea regia</i>
*Variable oystercatcher	Can use Miranda as a feeding ground and breeding grounds at Cape Colville	<i>Haematopus unicolor</i>
*Wrybill	Winters in the firth of Thames (as above)	<i>Anarhynchus frontalis</i>
Caspian tern	Breeds Nov – Jan. Common along coastline	<i>Sterna caspia</i>
White-fronted tern	Breeding October-February; breeds in firth of Thames and other locations on Coromandel coast and West coast.	<i>Sterna striata</i>
Black-fronted tern	Not normally found in Coromandel.	<i>Sterna albobstriata</i>
Pied shag	Classified as threatened. A significant population breeds on the Thames Coast and elsewhere on Coromandel Peninsula. Breeding season year round.	<i>Phalacrocorax varius</i>

3.1.3 Category 3: third priority for deterrence, rescue, and rehabilitation

Name	Breeding season	Genus species
Northern giant petrel		<i>Macronectes halli</i>
Southern giant petrel		<i>Macronectes giganteus</i>
Sooty shearwater		<i>Puffinus griseus</i>
Flesh-footed shearwater		<i>Puffinus carneipes</i>
Fluttering shearwater		<i>Puffinus gavia</i>
Little shearwater		<i>Puffinus assimilis</i>
Common diving petrel		<i>Pelecanoides urinatrix</i>
Cape pigeon		<i>Daption capense</i>
Fairy prion		<i>Pachyptila turtur</i>
Broad-billed prion		<i>Pachyptila vittata</i>
Thin-billed prion		<i>Pachyptila belcheri</i>
Salvin's prion		<i>Pachyptila salvini</i>
Antartic prion		<i>Pachyptila desolata</i>
Cook's petrel		<i>Pterodroma cookii</i>
Black-winged petrel		<i>Pterodroma nigripennis</i>
White-headed petrel		<i>Pterodroma Lessonii</i>
Grey-faced petrel		<i>Pterodroma macroptera</i>
Grey-backed storm petrel		<i>Oceanites nereis</i>
Australasian gannet		<i>Morus serrator</i>
Black shag		<i>Phalacrocorax carbo</i>
Little black shag		<i>Phalacrocorax sulcirostris</i>
Little shag		<i>Phalacrocorax melanoleucos</i>
Spotted shag		<i>Stictocarbo punctatus</i>
White-faced heron		<i>Ardea novaehollandiae</i>
Grey duck		<i>Anas superciliosa</i>
Australasian shoveler		<i>Anas rhynchotis</i>
Grey teal		<i>Anas gracilis</i>
Pied oystercatcher		<i>Haematopus ostralegus</i>
Spur-winged plover		<i>Vanellus miles</i>
Pied stilt		<i>Himantopus himantopus</i>
Banded dotterel		<i>Charadrius bicinctus</i>
Pacific golden plover		<i>Pluvialis fulva</i>
Lesser knot		<i>Calidris canutus</i>
Curlew sandpiper		<i>Calidris ferruginea</i>
Turnstone		<i>Arenaria interpres</i>

Sharp-tailed sandpiper		<i>Calidris acuminata</i>
Pectoral sandpiper		<i>Calidris melanotos</i>
Red-necked stint		<i>Calidris ruficollis</i>
Eastern curlew		<i>Numenius madagascariensis</i>
Whimbrel		<i>Numenius phaeopus</i>
Bar-tailed godwit		<i>Limosa lapponica</i>
Wandering tattler		<i>Tringa incana</i>
Siberian tattler		<i>Tringa brevipes</i>
Arctic skua		<i>Stercorarius parasiticus</i>
Pomarine skua		<i>Stercorarius pomarinus</i>
Brown skua		<i>Catharacta skua</i>
Red-billed gull		<i>Larus novaehollandiae</i>
Black-billed gull		<i>Larus bulleri</i>
Little tern		<i>Sterna albifrons</i>
Kingfisher		<i>Halcyon sancta</i>
Shore skink		<i>Oligosoma smithi</i>
Egg-laying skink		<i>Oligosoma suteri</i>
NZ fur seal		<i>Arctocephalus forsteri</i>

Category 4: fourth priority for deterrence, rescue and rehabilitation

Name	Genus species
Black swan	<i>Cygnus atratus</i>
Mallard	<i>Anas platyrhynchos</i>
Black backed gull	<i>Larus dominicanus</i>

4 Upstream of the CMA summary of fish, crustaceans, and fauna for major rivers

4.1 Shoreline Habitats

This habitat is a unique interface of dynamic environments and fauna populations. Variations in climate and seasonal shifts makes this environment anything but predictable and stable. Current movement is downstream till it reaches the river mouth, where incoming tides can carry the oil back upstream. River levels and flow direction/strength is also influenced by rain events. This can make response very difficult as the oil can remobilise many times contaminating areas already cleared of oil residue. The trajectory of oil in this environment is very unpredictable with oil changing paths as different climatic and physical/environmental conditions exert their influences.

4.2 Response

Deflection booms can be used to move a slicks direction in increments and influence a slicks final trajectory. The advantage of having deflection booms in place is that oil can be deflected into areas where the oil can naturally collect allowing sorbent booms, skimmers, or suction trucks to be used. It is important to be adaptable and use natural pooling areas to set up recovery gear. Any recovery equipment deployed needs to work on both tide phases, and consideration made to having two recovery sites if one will not allow all tide recovery.

It may prove difficult to remove oil from vegetation at the river's edge, however the affects can be mitigated sometimes by deploying booms around sensitive areas. Blowers or prop wash can dislodge oil from river side vegetation or direct slicks if the situation suits.

Once vegetation is oiled it may have to be cut away, burnt or flushed. Leaving the oil to weather and break down on the vegetation may also be a response option. The potential of doing more damage than good from attempted oil recovery must always be considered before carrying out clean-ups around vegetation and/or soft surfaces.

4.3 Important Factors to Consider

Damage can be done if oil residue on mud, silt or sand etc is compressed into lower layers by foot traffic or recovery activity as the oil will tend to be trapped in an anaerobic environment making bacterial breakdown very unlikely.

There are many uses for sorbent booms in this environment and they do make good deflection/recovery booms if the current is not too strong and the response is of short time duration. Rapid deployment booms are also very useful but are not very efficient in the tidal land/sea interface. Land sea booms are better suited in this interface and are very good at stopping oil from circumventing the tidal zone. Land sea booms do tend to need constant maintenance to maintain maximum efficiency.

4.4 Waikato River

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Australian longfin eel	<i>Anguilla reinhardtii</i>
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Black flounder (patiki)	<i>Rhombosolea retiaria</i>
Black mudfish	<i>Neochanna diversus</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>
Cran's bully	<i>Gobiomorphus basalis</i>
Freshwater crayfish (koura)	<i>Paranephrops planifrons</i>
Giant bully	<i>Gobiomorphus gobiodes</i>
Giant kokopu (kokopu)	<i>Galaxias argenteus</i>
Grey mullet	<i>Mugil cephalus</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Koaro	<i>Galaxias brevipinnis</i>
Lamprey (pirahau)	<i>Geotria australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Redfin bully	<i>Gobiomorphus huttoni</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Short-jawed kokopu	<i>Galaxias postvectis</i>
Shrimp (kouraura)	<i>Paratya curvirostris</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>
Yellow-eyed mullet (aua)	<i>Aldrichetta forsteri</i>

Threatened species include:

- Giant Kokopu
- Longfin Eel
- Black Mudfish

Invertebrate communities are dominated by freshwater shrimp. Mysid shrimp, once common, are low in numbers.

Species that mainly live in salt water (influenced by tidal levels):

- Black flounder.
- Inanga (main whitebait species) that move upstream when young hatch in spring to join other whitebait species.

Introduced Fish

Common name	Scientific name
Brown trout	<i>Salmo trutta</i>
Catfish	<i>Ameiurus nebulosus</i>
Gambusia or mosquito fish	<i>Gambusia affinis</i>
Goldfish	<i>Carassius auratus</i>
Grass carp	<i>Ctenopharyngodon idella</i>
Koi carp	<i>Cyprinus carpio</i>
Perch	<i>Perca fluviatilis</i>
Rainbow trout	<i>Onchorhynchus mykiss</i>
Rudd	<i>Scardinius erythrophthalmus</i>
Tench	<i>Tinca tinca</i>

River Invertebrates

They include insects, snails, worms and crustaceans, such as koura (freshwater crayfish). Different types of invertebrates live in different parts of the River, depending on the water quality and the river bed substrate, for example, whether the river bed is sandy or rocky.

Soft shallow shorelines are usually covered by under water plants. They provide a home for damselfly larvae, small fish, snails, fine algae and beetles. Rocky areas in shallow parts of the River are home to small filamentous algae and sponges.

Hydro Lakes

- A wide variety of fish, including brown and rainbow trout, catfish, smelt, rudd, common bullies, elvers (baby eels), goldfish and carp.
- Other animals including freshwater sponges, insects and snail larvae, pea mussels and freshwater mussels.

Plant-life in and around the lakes consists of:

- Hornwort and the oxygen weed *Egeria densa* are the most abundant aquatic plants.
- Sweetgrass, bull rush, raupo and assorted reeds along the lake shores.

4.5 Awakino River

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Common Smelt	<i>Retropinna retropinna</i>
Banded kokopu	<i>Galaxias fasciatus</i>
Koaro	<i>Galaxias brevipinnis</i>
Bluegilled bully	<i>Gobiomorphus hubbsi</i>
Common bully	<i>Gobiomorphus cotidianus</i>
Torrentfish	<i>Cheimarrichthys fosteri</i>
Shortfin eel	<i>Anguilla australis</i>
Redfinned bully	<i>Gobiomorphus huttoni</i>
Inanga	<i>Galaxias maculatus</i>
Longfin eel	<i>Anguilla dieffenbachia</i>
Yellow-eyed mullet	<i>Aldrichetta forsteri</i>
Giant kokopu	<i>Galaxias argenteus</i>

Introduced fish

Common name (Māori name)	Scientific name
Rainbow Trout	<i>Oncorhynchus mykiss</i>
Brown trout	<i>Salmo trutta</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.6 Piako River

Native Fish

Common name (Māori name)	Scientific name
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Black mudfish	<i>Neochanna diversus</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>
Cran's bully	<i>Gobiomorphus basalis</i>
Grey mullet	<i>Mugil cephalus</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>
Yellow-eyed mullet (aua)	<i>Aldrichetta forsteri</i>

Introduced Fish

Common name (Māori name)	Scientific name
Catfish	<i>Ameiurus nebulosus</i>
Gambusia or mosquito fish	<i>Gambusia affinis</i>
Goldfish	<i>Carassius auratus</i>
Koi carp	<i>Cyprinus carpio</i>
Rudd	<i>Scardinius erythrophthalmus</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.7 Kaueranga River

Native fish and Crustaceans

Common name (Māori name)	Scientific name

Introduced Fish

Common name (Māori name)	Scientific name
Rainbow trout	<i>Onchorhynchus mykiss</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.8 Tairua River

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Yellow-eyed mullet (aua)	<i>Aldrichetta forsteri</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>
Giant kokopu (kokopu)	<i>Galaxias argenteus</i>
Koaro	<i>Galaxias brevipinnis</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Short-jawed kokopu	<i>Galaxias postvectis</i>
Lamprey (pirahau)	<i>Geotria australis</i>
Giant bully	<i>Gobiomorphus gobiodes</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>
Redfin bully	<i>Gobiomorphus huttoni</i>

Introduced Fish

Common name (Māori name)	Scientific name
Rainbow trout	<i>Onchorhynchus mykiss</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.9 Coromandel

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Yellow-eyed mullet (aua)	<i>Aldrichetta forsteri</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>
Giant kokopu (kokopu)	<i>Galaxias argenteus</i>
Koaro	<i>Galaxias brevipinnis</i>
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Short-jawed kokopu	<i>Galaxias postvectis</i>
Lamprey (pirahau)	<i>Geotria australis</i>
Giant bully	<i>Gobiomorphus gobiodes</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Bluegill bully	<i>Gobiomorphus hubbsi</i>
Redfin Bully	<i>Gobiomorphus huttoni</i>
Cran's bully	<i>Gobiomorphus basalis</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>

Introduced Fish

Common name (Māori name)	Scientific name
Gambusia or mosquito fish	<i>Gambusia affinis</i>
Rainbow trout	<i>Onchorhynchus mykiss</i>
Brown trout	<i>Salmo trutta</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.10 Ohinemuri River

Native Fish and Custaceans

Common name (Māori name)	Scientific name
Shortfin eel (hao)	<i>Anguilla australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Cran's bully	<i>Gobiomorphus basalis</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>
Redfin bully	<i>Gobiomorphus huttoni</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>

Introduced Fish

Common name (Māori name)	Scientific name
Brown trout	<i>Salmo trutta</i>
Rainbow trout	<i>Onchorhynchus mykiss</i>

4.11 Waihou River

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Yellow-eyed mullet (aua)	<i>Aldrichetta forsteri</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>
Torrentfish (papamoko)	<i>Cheimarrichthys fosteri</i>
Koaro	<i>Galaxias brevipinnis</i>
Dwarf galaxias	<i>Galaxias divergens</i>
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Inanga (main whitebait species)	<i>Galaxias maculatus</i>
Short-jawed kokopu	<i>Galaxias postvectis</i>
Common bully (pako)	<i>Gobiomorphus cotidianus</i>
Redfin bully	<i>Gobiomorphus huttoni</i>
Cran's bully	<i>Gobiomorphus basalis</i>
Common smelt (ngaoire)	<i>Retropinna retropinna</i>

Introduced Fish

Common name (Māori name)	Scientific name
Koi carp	<i>Cyprinus carpio</i>
Gambusia or mosquito fish	<i>Gambusia affinis</i>
Rainbow trout	<i>Onchorhynchus mykiss</i>
Perch	<i>Perca fluviatilis</i>
Brown trout	<i>Salmo trutta</i>
Rudd	<i>Scardinius erythrophthalmus</i>
Tench	<i>Tinca tinca</i>

Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

4.12 Rivers that run into Raglan Harbour

Rivers that run into Raglan include Oporuru River, Waingaro River, Tawathai River, and Waitetuna River.

Native Fish and Crustaceans

Common name (Māori name)	Scientific name
Banded kokopu (para)	<i>Galaxias fasciatus</i>
Shortfin eel (hao)	<i>Anguilla australis</i>
Longfin eel (Kuwharuwharu)	<i>Anguilla dieffenbachii</i>

Introduced Fish

Common name (Māori name)	Scientific name

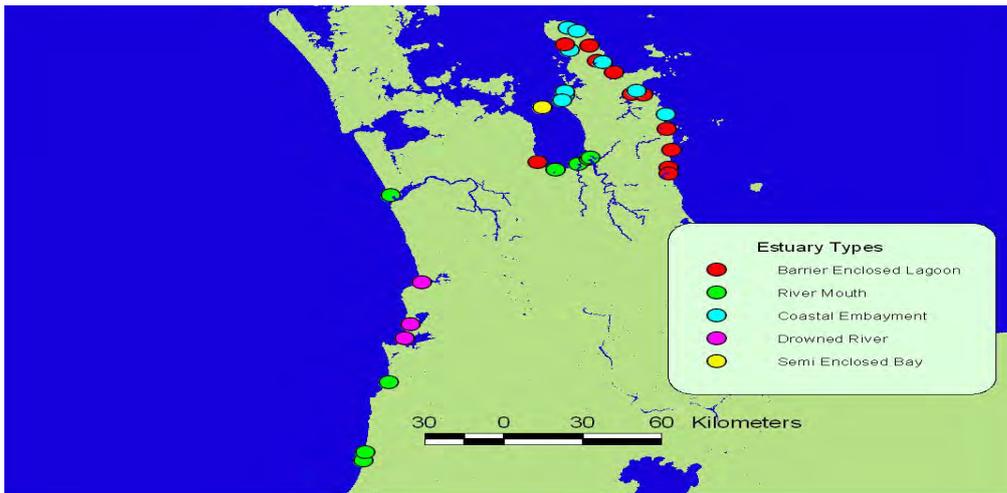
Mammals

Mammals such as fur seals may move up rivers to feed on fresh water fish species and to rest in bad weather.

Bird life

There may be various species of birdlife resting in areas upstream of the CMA. There may also be high density populations of various bird varieties in this type of habitat. These tend mostly to be category 4 species with some from category 3.

5 Priority areas for protection



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Figure 3 Estuary types in the Waikato Regional Council region

This map comes from a Waikato Regional Council document (# 659340) titled Waikato Region Estuaries. More recent information is available in the WRC OurMaps layer.

6 Map index (refer Waikato Regional Coastal Plan)

The map references are shown in the overview maps below ([Waikato Regional Plans](#)). The number highlighted in red (as shown below) indicates which map you are viewing.



Figure 4: Overview map of the West Coast

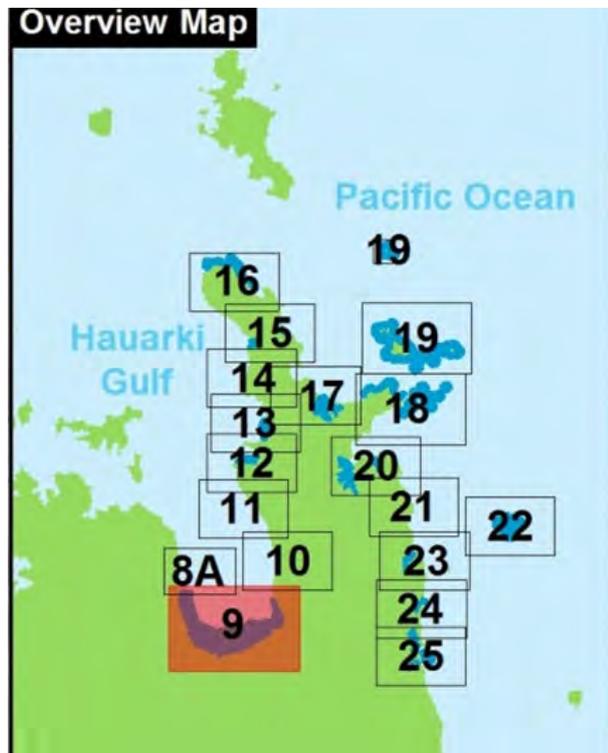
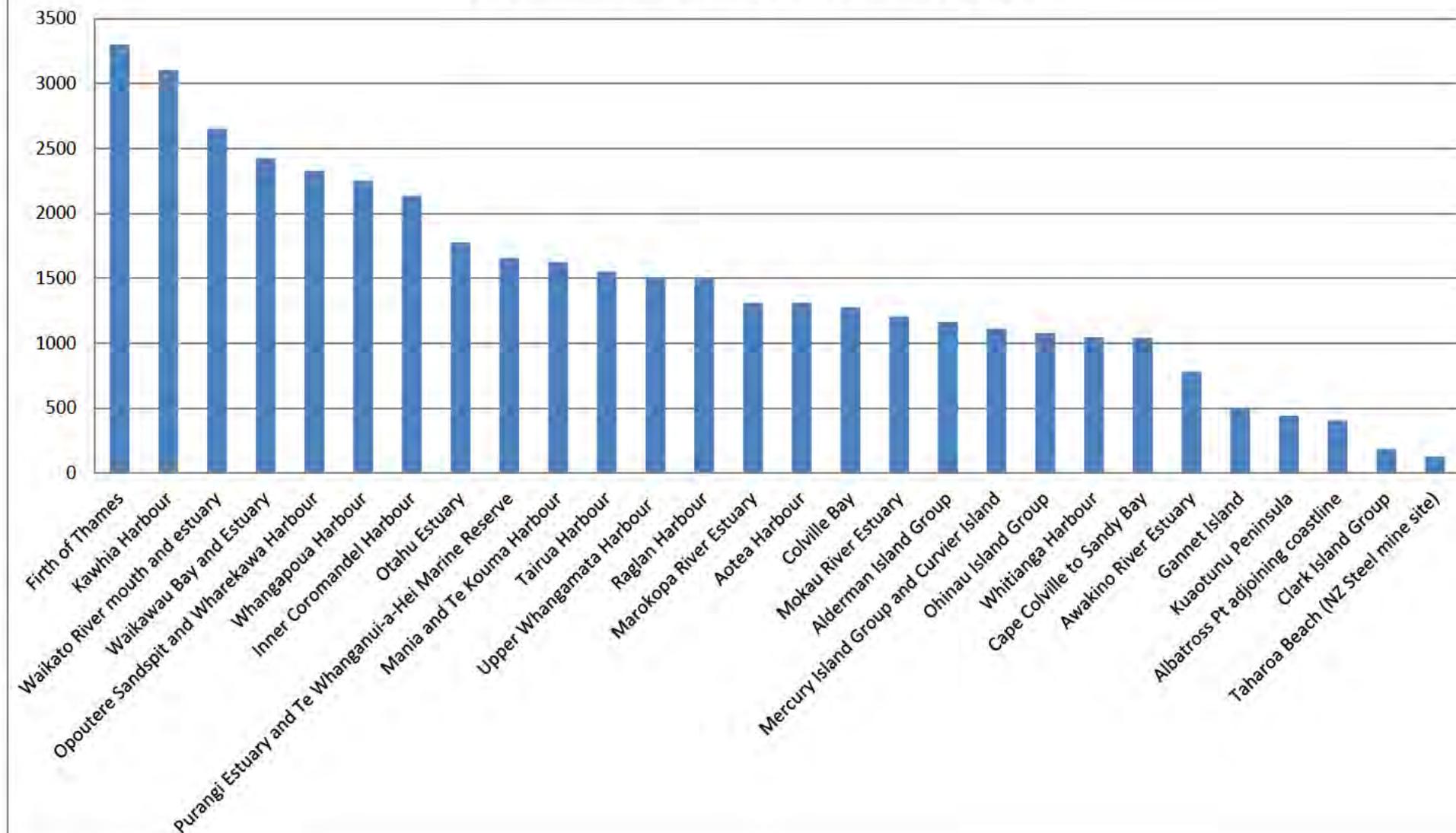


Figure 5: Overview map of Coromandel

Environmental Risk Assessment Score



Site 1	Mokau River Estuary	Risk: moderate
Classification	West Coast/ Intertidal area/ Tidal river	
Description <i>*Citations noted in brackets.</i> A river estuary of 100 ha formed behind an extensive sand dune and sand spit. It contains extensive areas of intertidal mudflats and saltmarsh which are bounded by remnant lowland coastal and riparian forest (1). Habitat for resident and frequenting rare and threatened wildlife (waders, coastal and freshwater birds and Maui Dolphins) (2).		
Foreshore Type/Environmental value	Tidal mudflats and saltmarsh Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological	
Map sheets	Topo50- BG31	Topo250- 9
At risk resources <ul style="list-style-type: none"> • Adjoining high quality protected riverine habitat (3). • There are 15 coastal/wetland bird species recorded, including the threatened reef heron, New Zealand dotterel, North Island fernbirds and the rare variable oystercatcher. New Zealand dotterel may breed in the Mokau river mouth area and the estuary is an important wintering site for black stilts (3). • Maui dolphins have been recorded from the river mouth estuarine bar (1). • Coastal community occurring on muddy sand is dominated by hermit crabs and a notable epifauna of sponges, hydroids, barnacles and starfish is known off the river (3). • Northern blue penguin and white-flipped penguin breed at river mouth (3). • New Zealand fur seals occasionally haul out and forage in this area (3). • Site of significance to Tainui and Taranaki iwi. The estuary is the landing site of the Tainui waka and holds strong ancestral ties for both iwi. Also provides important food sources for Ngati Maniapoto (1). • Whitebait spawning habitat and regionally significant whitebait and native fishery (2). • Regionally significant for boating and fishing (1). • Geopreservation sites- Mokau coastal features and archaeological sites (2). 		
Notes <ul style="list-style-type: none"> • Communications - Cellphone (marginal), Marine Radio (VHF International CH4) and phone (through local residents and businesses only). • Dangerous bar at harbour entrance for navigation (1). Actions (preferred protection and clean up options) <ul style="list-style-type: none"> • Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. • Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 • Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore unless the sea is calm, as the area is exposed and subject to rough seas. • Carry out shoreline and wildlife rehabilitation if required. 		
Endpoint criteria <ul style="list-style-type: none"> • Rehabilitation dependent on stakeholder expectations and surveys of unaffected immediate surrounding area. 		
Access <ul style="list-style-type: none"> • Boat: access to the river/estuary via boat launching facilities on the northern shores immediately downstream of the SH3 road bridge. Refer topographical map. • Vehicle: from the end of the public road around to the mouth of the estuary is restricted to 4WD only. 		

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and recovery	✓		Estuary only
On water recovery	✓		Not very likely
Dispersant application	✓ (Off shore)	✓ (In shore)	Probably no point
Shoreline cleanup		✓	Most likely on beach
Natural recovery	✓		Very likely

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.

Site 2	Awakino River Estuary		Risk: High
Classification	West Coast/ Intertidal area/ Tidal river		
Description			
<i>*Citations noted in brackets.</i>			
A small river estuary formed behind a moderately sized sand dune and sand spit. The estuarine area is small with the tidal portion of the river merging directly into the Awakino River. Habitat for resident and frequenting rare and threatened wildlife (waders, coastal and freshwater birds and Maui dolphin).			
Foreshore Type / Environmental Value	Sand beach and estuary Habitat/ Cultural/ Food/ Amenity/ Archaeological		
Map sheets	Topo50- BG31	Topo250- 9	
At risk resources			
<ul style="list-style-type: none"> • Nationally important for resident and frequenting, rare and threatened, wading, coastal and freshwater bird species (1). • There are a variety of coastal/wetland bird species recorded, including the Caspian tern, New Zealand dotterel and the fern bird in the area of reeds in the estuarine zone. • Maui dolphins have been recorded at the river mouth. • Whitebait spawning habitat and regionally significant whitebait fishery (1). • Site of cultural importance for Tainui iwi (1). • Fishing area and source of kaimoana for Ngati Maniapoto. Most of the coastal shellfish beds are situated north of this river mouth. • Regionally significant recreation resource (1). • Archaeological sites (1). 			
Notes			
Communications: MUST USE SATELLITE PHONE, RT SYSTEM or 0800 number from pub. Cellphone (non-existent), Marine Radio (VHF International CH4), phone (through local residents and businesses only).			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> • Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. • Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 • Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. • History would suggest that oil spill risk to this area is more likely to come from truck accidents in the gorge discharging oil down the Awakino River and out into the estuarine and sea area. (see WRC Doc# 2010369 Awakino Oil Spill report) <ul style="list-style-type: none"> - Sea borne oil is best intercepted at the boat ramp or deflected at the river mouth if conditions allow. - River borne oil is best intercepted as far upstream as possible to contain and recover the oil before it reaches the estuarine whitebait breeding areas. Once the oil is in the estuarine area it can prove difficult to recover or mobilise out of the reeds. The oil also has the potential to create more environmental impact the further it progresses downstream. • Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> • Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
Boat: access to the river/estuary via boat launching facilities immediately downstream of the Awakino pub and small settlement of houses just off state highway on the southern side of the river.			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and recovery	✓		Estuary only
On water recovery	✓		Not very likely
Dispersant application	✓(Offshore)	✓(Inshore)	Probably no point
Shoreline cleanup		✓	Most likely on beach
Natural recovery	✓		Very likely

References

1. *Doc# 659340.*

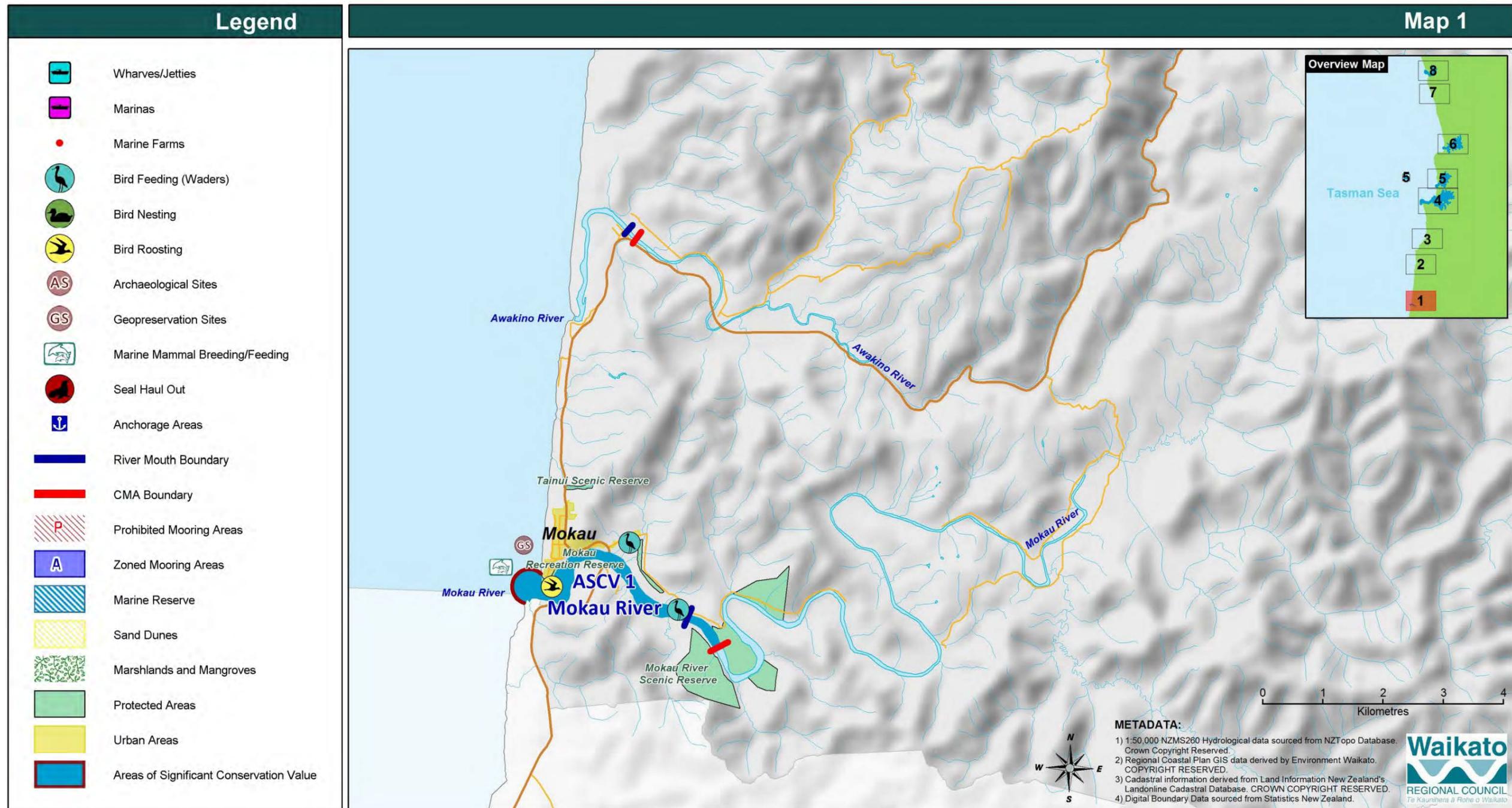


Figure 6 Mokou River estuary & Awakino River Estuary

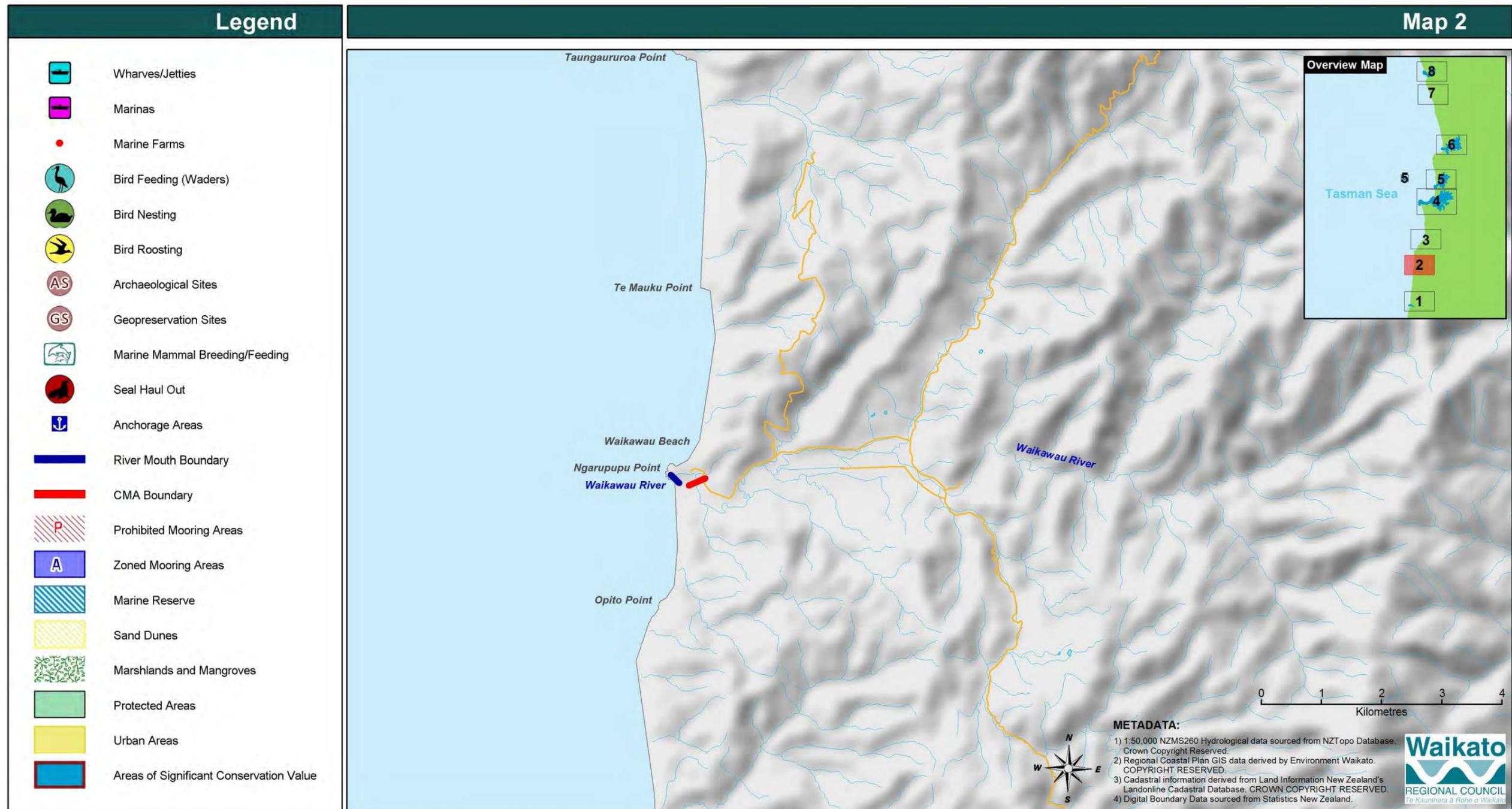


Figure 7 Waikawau River estuary

Site 3	Marokopa River Estuary		Risk: moderate
Classification	West Coast/ Intertidal areas/ Tidal rivers		
Description <i>*Citations noted in brackets.</i> This is a moderately sized river estuary, which has formed behind an extensive sand dune and sand spit. Tidal waters with sand, mudflat and areas of remnant unmodified saltmarsh. Habitat for resident and rare and threatened wading coastal bird species and Maui dolphin.			
Foreshore Type / Environmental Value	Sand, mudflat and saltmarsh. Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BF31	Topo250- 9	
At risk resources <ul style="list-style-type: none"> - 12 species of coastal and wading birds have been recorded, including the threatened reef heron, banded rail, New Zealand dotterel and caspian tern (3). - Dunes, small coastal wetlands and a lagoon near Kiritehere Stream provide habitat for common coastal birds (3). - Maui dolphins have been recorded at the river mouth. - The area around Tirua Point is a winter haul out station for New Zealand fur seals (3). - Site of cultural importance to Tainui iwi for gathering kaimoana (2). - Pinago is present on the foredune of Marokopa spit (3). - The estuary is a regionally significant whitebait fishery and a locally significant kahawai fishery. - Shellfish gathering occurs in the estuary (1). - Geopreservation sites: Marokopa zeolite facies (R16 595 187), Marokopa-Kiritehere coast (R16 598 198), Marokopa River mouth - triassic-jurassic contact (R16 600 202), Marokopa River mouth sandspits and dune field (4). - Archaeological sites (1). 			
Notes <ul style="list-style-type: none"> - Cell phone coverage is limited, communications via Marine Radio (VHF International CH4) and phone (through local residents only). 			
Actions (preferred protection and clean up options) <ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access <ul style="list-style-type: none"> - Beach/River access can be gained off Marakopa Rd. Boat access can be gained at certain points (there's no formal facilities). Refer topographical map. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Estuary only
On water Recovery	✓		Not very likely
Dispersant Application	✓(Offshore)	✓(Inshore)	No point
Shoreline Cleanup		✓	Most likely option
Natural Recovery	✓		Very likely

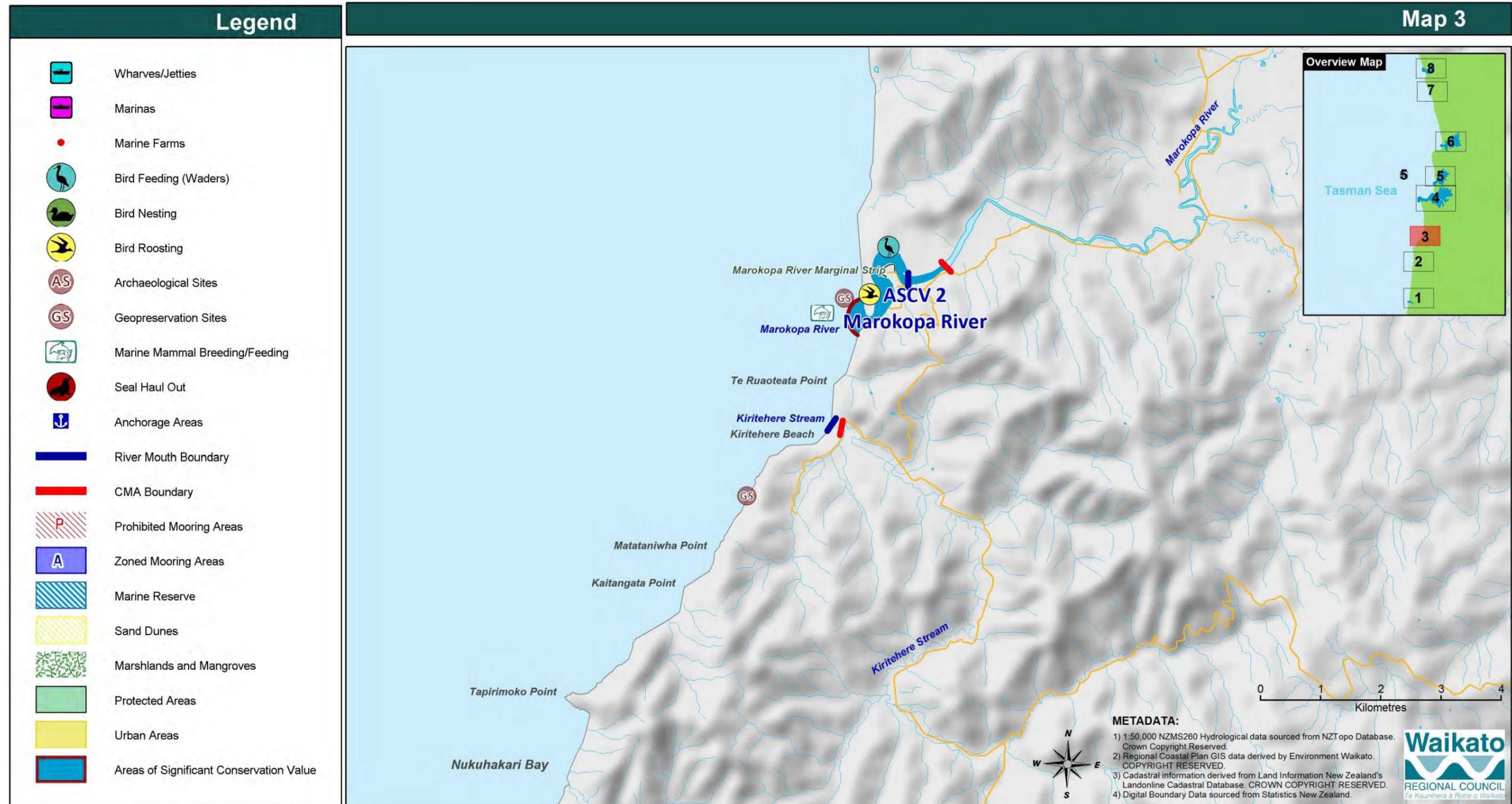


Marokopa River Estuary (Bourma, 2007).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Figure 8 Marokopa River estuary



Site 4	Taharoa Beach		Risk: Low
Classification	West Coast/ Subtidal area/ Coastal environment		
Description			
<i>*Citations noted in brackets.</i>			
The site, immediately adjacent to the New Zealand Steel Taharoa mine site, includes a 7km length of exposed sandy beach, with rock stacks and wave cut platforms at each end. The New Zealand Steel offshore single buoy mooring, where iron sand slurry is transferred to bulk carriers for export, is approx 3kms offshore from the site.			
Foreshore Type / Environmental Value	Sand, exposed rock stack, wave cut platforms and cliffs. Habitat/ Cultural/ Amenity/ Geopreservation		
Map sheets	Topo50- BE31	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Migratory wading birds – Pied Oyster Catcher, Bar Tailed Godwit, New Zealand Dotterel. - Whitebait. - Site of cultural importance to iwi, burial grounds in sand dunes. Taharoa C Incorporation are the main iwi for this area. Ngati Mahuta and Ngati Maniapoto also have interests in this area. - Beach recreational activities (surfing, fishing etc). - Geopreservation sites: Taharoa dune fields (R16) (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via the New Zealand Steel site. Marine Radio (VHF International CH 7 for vessel operations), phone land lines and 021 mobile network (no 027 coverage). Internet access. - It is important that before launching an oil spill response on the West Coast contact is made with Port Taharoa. They undertake sand-dredging activities out of Taharoa which can resemble an oil spill from air. A picture taken during the resulting fly-over is included on page 3 for reference. - NZ Steel Logistical Support: Earthmoving Equipment – 3 x Diggers (25, 15 and 10 tonne), 5 x Bulldozers, Dump trucks. 80 x NZ Steel staff. - Potential ICC and Forward Operations base facilities: <ul style="list-style-type: none"> - New Zealand Steel mine site office buildings could be available as an ICC or forward operations base. There are also multiple large areas for equipment storage, temporary storage of oily waste and vehicle parking. - NZ Steel Operations Centre (vhf, internet, parking and helipad) - Taharoa Village Community Hall: significant parking and sports field available. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: Nearest wharf and boat ramp is located at Kawhia (boat ramp suitable for ORV launching). 			

- **Vehicle:** Beach access is via two 4wd tracks accessed through the mine site. Further access points could be created through the dunes with heavy machinery if required. Road access suitable for heavy vehicles via Taharoa Rd.
- **Air:** Gravel Airstrip (approximately 900m long by 10m wide) and helicopter pad.

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Not very likely
On water Recovery		✓	No
Dispersant Application	✓(Offshore)		No
Shoreline Cleanup	✓		Most likely
Natural Recovery	✓		Also likely

Operations Centre



Runway



Operations Centre Helipad



References

4. Waikato Region. *New Zealand Geopreservation Inventory*. [Online]

<http://homepages.ihug.co.nz/~bw.hayward/NZGI/>

Site 5	Albatross Pt / coastline		Risk: Low
Classification	West Coast/ Subtidal area/ Coastal environment		
Description			
<i>*Citations noted in brackets.</i>			
A 9km length of exposed rocky shoreline, with rock stacks, wave platforms, cliffs and sandy bays. The site includes Te Arawi headland, a site of historical importance to Tainui iwi.			
Foreshore Type / Environmental Value	Exposed rocky shores, rock stacks, wave platforms, cliffs and sandy bays. Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BE31	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - The coastline is used by the NZ fur seal (<i>Anctocephalus forsteri</i>) as a haul out and breeding site (3). Up to 50 seals recorded which makes this one of the largest and most northern sites off the West Coast of the North Island. - Is located on the annual migration route for New Zealand pied oystercatchers (3). - Site of cultural importance to Tainui iwi for gathering kaimoana. - Maui and common dolphins have been sighted in the area (3). - Fishing takes place off Albatross Point where access is available. - Nationally significant fossil and geological site. Intertidal platforms and cliffs contain bivalve and branchiopod fossil groups and Holostratotope of Aratauron stage. Arataura Pt (R15 631 415), Ururoa Pt (R15 648 430), Albatross Point (R15) (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via Marine Radio (VHF International CH4) and phone (through local residents only) 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from washing onto the sensitive shoreline. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: Nearest boat ramp is located at Kawhia. - Vehicle: Beach access is almost non-existent (unless by foot). The nearest access route is Taharoa Rd. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		No
On water Recovery	✓		No
Dispersant Application	✓(Offshore)	✓(Inshore)	No
Shoreline Cleanup		✓	Maybe
Natural Recovery	✓		Most likely



Albatross Point (3).

References

3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Site 6	Kawhia Harbour		Risk: High
Classification	West coast/ Intertidal areas/Drowned valleys		
Description			
<i>*Citations noted in brackets.</i>			
A large west coast harbour with an irregular shoreline, extensive intertidal zones and channels which are largely unmodified. Kawhia Harbour is a particularly good example of a west coast harbour and ranked as nationally important. There are extensive seagrass beds and mudflats with saltmarsh in some bays and inlets. Areas of coastal forest and shrublands adjoin the shoreline along the southern margins. There is a wide diversity of estuarine vegetation and remnant freshwater wetland habitats up the Owhiro stream arm.			
Foreshore Type / Environmental Value	Tidal flats, saltmarsh and seagrass Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological/ Economic		
Map sheets	Topo50- BE31/32	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Outstanding value to international and national migratory waders, shore and wetland bird fauna. These include the endemic black stilt, an endangered species in New Zealand, the threatened New Zealand dotterel, banded dotterel, wrybill, caspian tern, variable oystercatcher, reef heron, white heron and royal spoonbill. In excess of 4% of the New Zealand population of SI pied oystercatchers 6% of bartailed godwits and large numbers of turnstones, and occasional Far Eastern curlews and Asiatic whimbreds over winter on the harbour (1), (3). - Important high tide roosts include Tiritirimatangi Peninsula and Te Motu Island and sandbanks (3). - Extensive seagrass and saltmarsh communities (1). - Scattered and small population of mangroves (5). Threatened coastal and estuarine vegetation includes Maori musk, Pingao, New Zealand Watercress <i>Crassula raumahanga</i>, <i>Pomaderris rugosa</i>, <i>Leptinella tenella</i> and Sea sedge (3). - Maui dolphins are regularly recorded at the harbour entrance. - Killer whales visit the harbour on average twice a year (3). - Site of immense value to Tainui iwi. Commonly referred to as the 'Hearth of Tainui'. Kawhia Harbour is the resting place of Tainui Waka- Te Ahurei, and has strong ancestral and spiritual ties with Tainui Iwi (2). - Regionally important for kaimoana gathering. - Used for boating, swimming, fishing, and leisure cruising. - Upwards of 11 geopreservation sites. Including Waiharakeke bridge - kinohaku jurassic sequence (R16 772 399), Maire Point (R16 704 382), Te Puia Springs (R15 663 470) and nationally significant fossil sites Te Maika Pt (R15 658 441), Totara Pt (R15 659 411), Arataura Pt (R15 631 415), Heteri Pt (R15 664 401), Ohaua Pt (R15 684 411), Ururoa Pt (R15 648 430), Puti Pt (R15 734 481) and Motutara Peninsula (R15 722 474) (4). - Archaeological sites (1) and historic Pohutukawa tree (R15 697 467) (2). - Marine farms and an established fishing port operate within the harbour. 			
Notes			
<ul style="list-style-type: none"> - Communications via Marine Radio (VHF International CH4), cellphone and phone (through local residents or businesses only). - Dangerous bar at harbour entrance for navigation (1). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Carry out shoreline and wildlife rehabilitation if required. 			

<p>Endpoint criteria</p> <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area.
<p>Access</p> <ul style="list-style-type: none"> - Boat: access can be gained from the Kawhia Boat ramp. - Vehicle: beach access can be gained at various points along SH31 and Harbour Rd. Refer topographical map.

Preferred Response Option Matrix

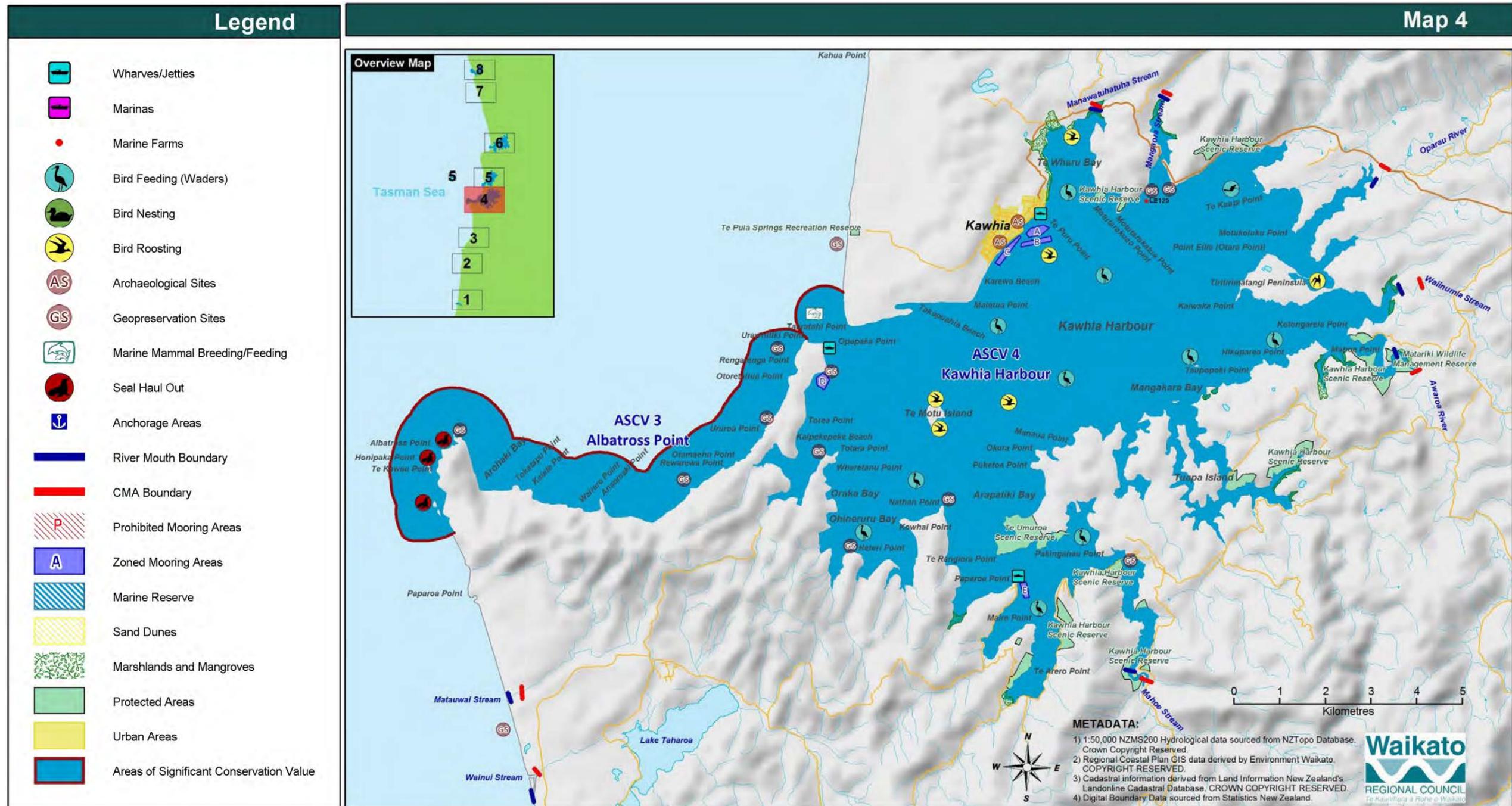
	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Yes in low current
On water Recovery		✓	Likely
Dispersant Application		✓	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		May be option



References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.iug.co.nz/~bw.hayward/NZGI/>.
5. Doc# 1010789.

Figure 9 Albatross Pt and adjoining coastline / Kawhia Harbour



Site 7	Aotea Harbour		Risk: moderate
Classification	West Coast/ Intertidal area/ Drowned Valley		
Description			
<i>*Citations noted in brackets.</i>			
A shallow harbour with large areas of sand and mudflat exposed at low tide. Relatively unmodified with considerable lengths of the shore vegetated in coastal forest and scrubland and some areas of intact estuarine-freshwater sequences. Extensive areas of seagrass, narrow margins of saltmarsh, often buffered by coastal forest and a diverse range of threatened species. Justifies a ranking of national importance.			
Foreshore Type / Environmental Value	Shallow harbour with tidal flat, saltmarsh and seagrass. Reserve/ Habitat/ Cultural/ Amenity/ Geopreservation		
Map sheets	Topo50- BE32	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Extensive sandspit and sand dune system classified as Scientific Reserve adjoining harbour (1). - Extensive seagrass communities (2). - Resident and frequenting rare and threatened waders and coastal bird fauna. Frequented by international and national migratory waders and important nationally for wintering shorebirds (2). Of note are the threatened New Zealand dotterel, banded dotterel, caspian tern, white fronted tern, banded rail, North Island fernbird, spotless crane, reef heron, variable oystercatcher, wrybill and endangered black stilt (3). - Maui dolphins have been recorded off the harbour entrance. - A small number of mangroves are present (6). - The threatened Pinago and Golden sand tussock are present (3). - Site of cultural importance to Tainui iwi (2). - Rohe Moana exists, where Kaitiaki are appointed for the management of customary food gathering (7). - Fishing, boating and swimming take place in the harbour. - Green-lipped mussel aquaculture present in harbour. - Geopreservation sites: Taranaki Point (R15 673 565) and the nationally significant Aotea dune fields (R15 732 588). The dune headland is described as being of local importance (3), (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via marine radio (VHF International CH4) and phone (through local residents or businesses only). - Dangerous bar at harbour entrance for navigation (1). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: access can be gained from the Aotea boat ramp. - Vehicle: beach access can be gained off Morrison, Aotea, Maihi Access, and Te Papatapu Roads, which fringe the harbour. Refer topographical map. 			

Pin referred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Likely low current area
On water Recovery		✓	Possible
Dispersant Application		✓	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Maybe



References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
6. Doc#1010795.
7. Protected coastal areas. *Waikato Regional Council.* [Online] <http://www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Coasts/Natural-character-and-biodiversity/co9-report/>.

Site 8	Gannet Island		Risk: Low
			HIGH
Even though this island did not score high in the risk matrix there is sufficient wildlife concentrations at particular times of the year to warrant a high status			
Classification	West Coast/ Subtidal area/ Offshore Island		
Description			
<i>*Citations noted in brackets.</i>			
Small rocky island of less than 2 ha, 18 km west of Aotea Harbour on the edge of the continental shelf. This is the only significant offshore island along the West coast from Mokau to Port Waikato, and as such has the only significant seabird nesting colony.			
Foreshore Type / Environmental Value	Exposed rocky shores Sanctuary/ Habitat/ Cultural		
Map sheets	Topo50- BE31	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Island Wildlife Sanctuary. <ul style="list-style-type: none"> - It is a major rookery and breeding site for the Australasian gannet, with breeding populations exceeding 20,000 birds through November to February. - Important haul out and breeding site for NZ fur seals with up to 200 animals recorded Irregularly (2). - In water biodiversity such as reef, fish, and sharks - Maori land. 			
Notes			
<ul style="list-style-type: none"> - The island is Maori land with an overlying status of wildlife sanctuary. Landing is by permit only. - Communications via Marine radio Marine Radio (VHF International CH4), Cellphone. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - The exposed coastline will reduce the effectiveness of deflection booms on the open coast. - Where possible, oil should be prevented from washing onto this island. - Prevention of the oil reaching the shore may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: There are boat launching facilities at Raglan and Kawhia Harbours. - Vehicle: NO vehicle access 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	No
On water Recovery		✓	No
Dispersant Application		✓	Maybe
Shoreline Cleanup		✓	No
Natural Recovery	✓		Yes

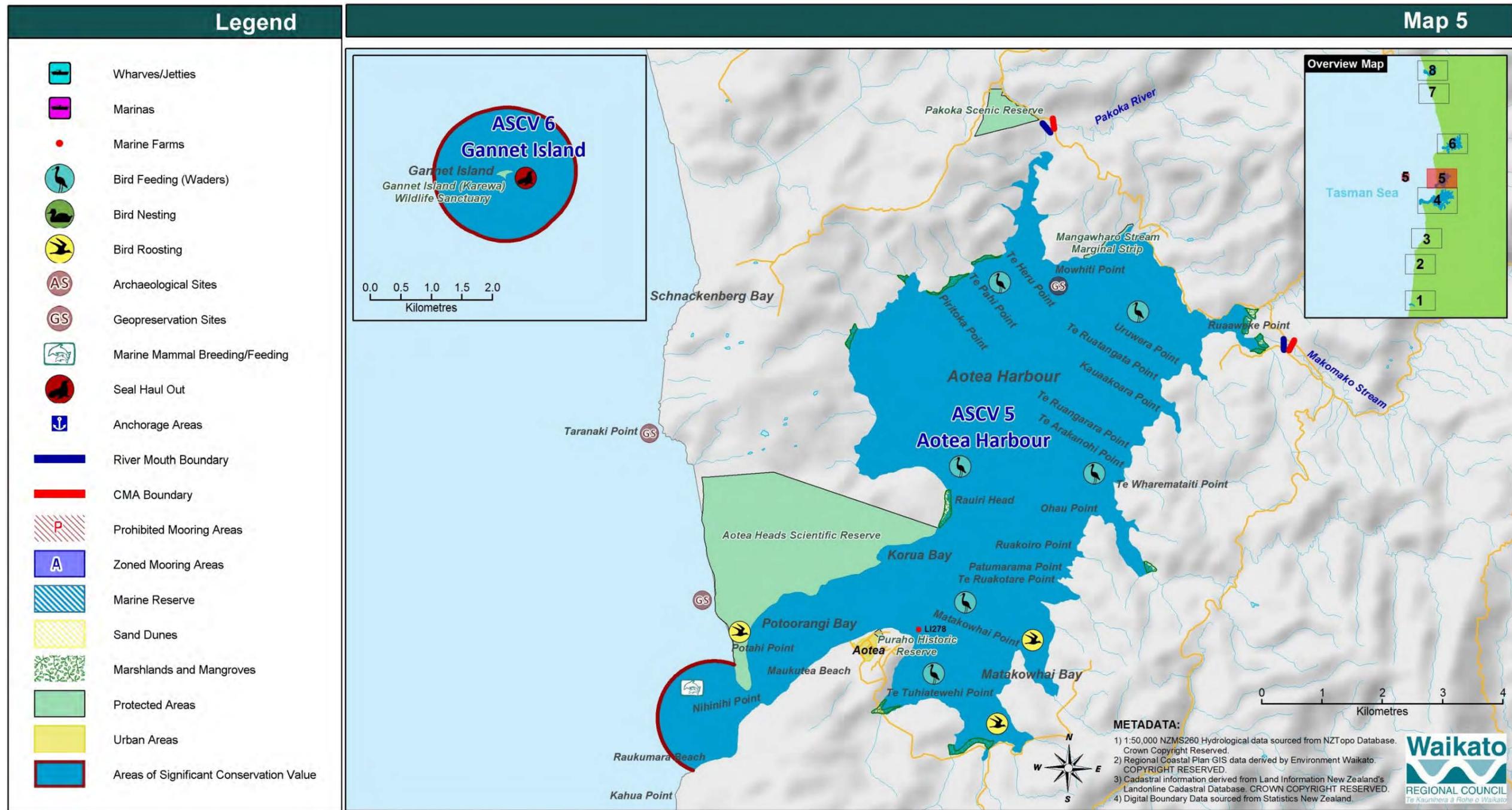


Gannet Island (3).

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.

Figure 10 Aotea Harbour & Gannet Island



Site 9	Raglan Harbour		Risk: moderate
Classification	West Coast/ Intertidal area/ Drowned Valley		
Description			
<i>*Citations noted in brackets.</i>			
A large west coast estuary with an irregular shoreline and numerous arms and embayments. The harbour has a narrow discontinuous saltmarsh zone around most of the shoreline, and extensive mudflat areas. An extensive feeding opportunity for wading species justifies its national significance.			
Foreshore Type / Environmental Value	Tidal lagoon with saltmarsh and mudflats. Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BD32	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Resident and frequenting rare and threatened wading and coastal bird fauna. Species recorded include the New Zealand dotterel, banded dotterel, White fronted tern, little black shag, North Island fernbird, threatened banded rail, caspian tern, reef heron, NZ dotterel and royal spoonbill and the endangered white heron. Also important to international migratory bird species (3). - Maui dolphins are regularly recorded at the harbour entrance. - Killer whales visit the harbour around once or twice a year (3). - A small stand of mangroves occurs at the Waingaro landing. - Site of cultural significance to Tainui, with archaeological sites present (1). - Mussels, scallops, cockles, pipis, tuatua, kina found in harbour (1). - Killer whales visit the harbour about once or twice a year (3). - The harbour is considered to be of local and regional significance, and is used for boating, swimming, fishing and shellfish gathering. - Important area for commercial fishing (8). - Geopreservation sites present. Raglan coastal karst. Map: R15; the most easily accessible and well known example of spectacular coastal karst on west coast North Island (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (Harbourmaster or Waikato DC Area Office), cellphone and Marine Radio (VHF International CH4). - Harbour entrance is dangerous (1). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: access can be gained from the Raglan boat ramp for harbour responses, and the Manu Bay boat ramp for open ocean responses. - Vehicle: Beach access is available from various points, especially near town, and off Otautira Rd for the eastern harbour reaches, and off Te Akau Wharf Rd for northern shore access. Refer topographical map. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery	✓		Low current areas
Dispersant Application		✓ (High flow areas/ outgoing tide)	No
Shoreline Cleanup		✓ (Silty)	Likely
Natural Recovery	✓		Maybe



Raglan harbour (8).

References

1. Doc# 659340.
3. Bouma, S. *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment*. Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory*. [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
5. Singleton, N. *Regional Estuary Monitoring Programme*. Hamilton : Waikato Regional Council, 2009.
6. Doc# 1010789.
7. Doc#1010795.

Figure 11 Raglan Harbour

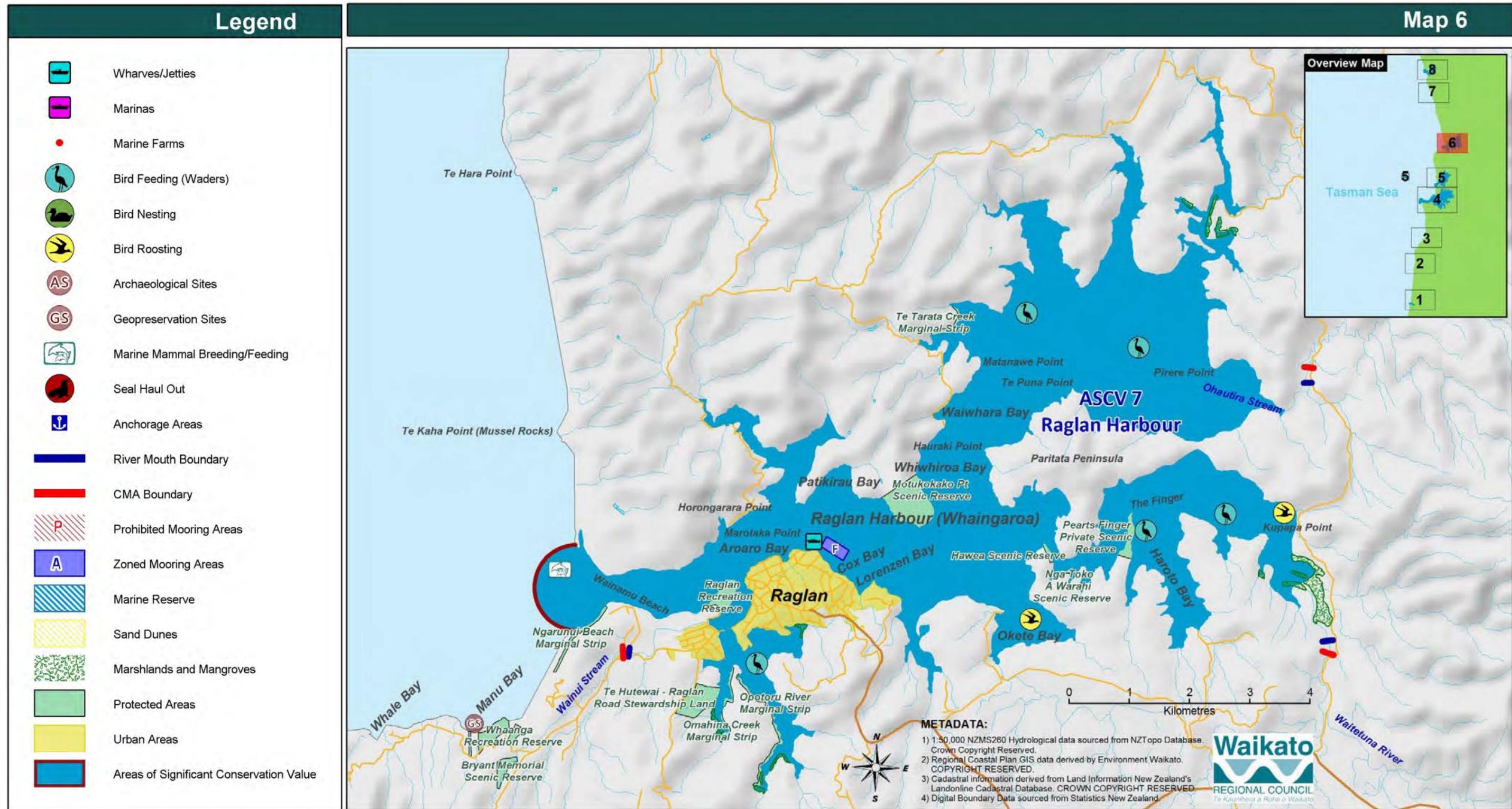
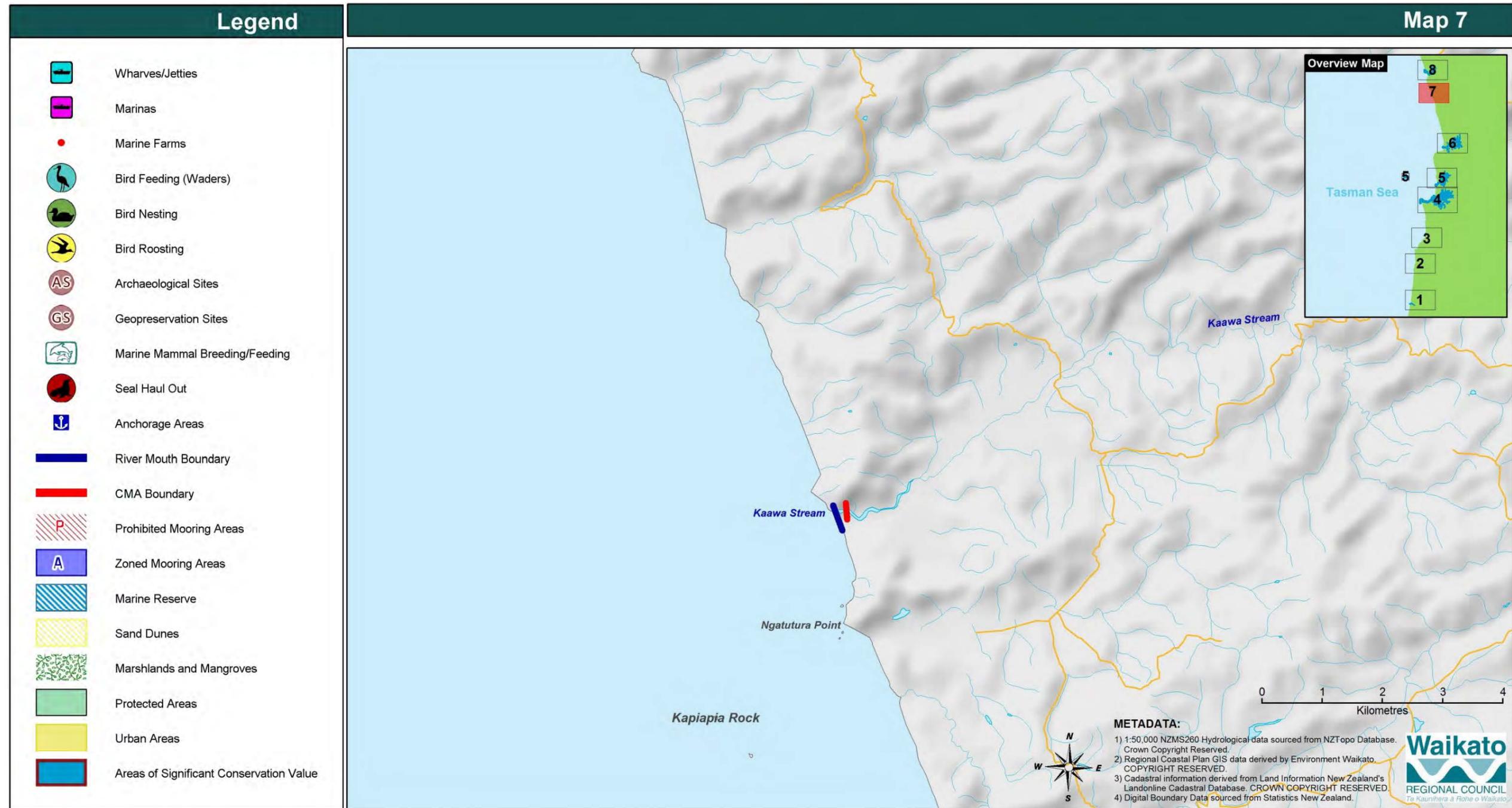


Figure 12 Kaawa Stream estuary



Site 10	Waikato River		Risk: High
Classification	West Coast/ Intertidal area/ Tidal river		
Description			
<i>*Citations noted in brackets.</i>			
A 588 ha river estuary with tidal flats along the channel margins and a large sand spit and dune system at the river mouth. The lower delta with its saltmarsh, seagrass, reed beds and tidal flats offers habitat for a diverse range of water birds and fish.			
Foreshore Type / Environmental Value	Tidal flats, sand spit, dune system and saltmarsh. Habitat/ Cultural/ Food/ Amenity /Geopreservation/ Archaeological		
Map sheets	Topo50- BC31	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Wildlife habitat of high value (2). - Resident and frequenting rare and threatened waders, coastal and freshwater bird fauna. Some 31 species of bird have been recorded as inhabiting the lower river, estuary shore vegetation, sand islands and sand spit. It is this habitat diversity and the range of species recorded that justifies its national ranking. The sand spit and islands are used by breeding populations of New Zealand dotterel, caspian tern, variable oystercatcher and white fronted tern. Other threatened visitors include, banded dotterel, reef heron, wrybill North Island fernbird and the endangered black stilt and the white heron (3). - Maui dolphins are often sighted off the river mouth. This area falls within their core area. - The threatened plant species Pinago is present on the foredunes (3). - Nationally significant whitebait and native fishery. The lower delta inclusive of the zone down river of the CMA boundary is the most important whitebait and eel fishery in the North Island and a popular recreational fishery (3). - Of immense value to Tainui with archaeological sites present (2). - Nationally significant fossil and land forms exposed (2). Fossils in jurassic mudstone are of national importance. - Geopreservation sites including internationally and nationally significant fossil landforms, Port Waikato complex landslide (R13 637 228) and Port Waikato sandspit (R13 660 248) (4). 			
Notes			
<ul style="list-style-type: none"> - It is unlikely that an oil spill at sea would enter this river estuary because of the net outflow of water from the river. - Communications via cellphone (marginal) and Marine Radio (VHF International CH4). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: A ramp is located at Port Waikato (off Tuakau Bridge – Port Waikato Rd). - Vehicle: Beach access can be gained at various points on either side of the estuary. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Estuary only
On water Recovery		✓	Not very likely
Dispersant Application		✓	Probably no point
Shoreline Cleanup		✓	Most likely on beach
Natural Recovery	✓		Very likely



The Waikato River mouth (3).

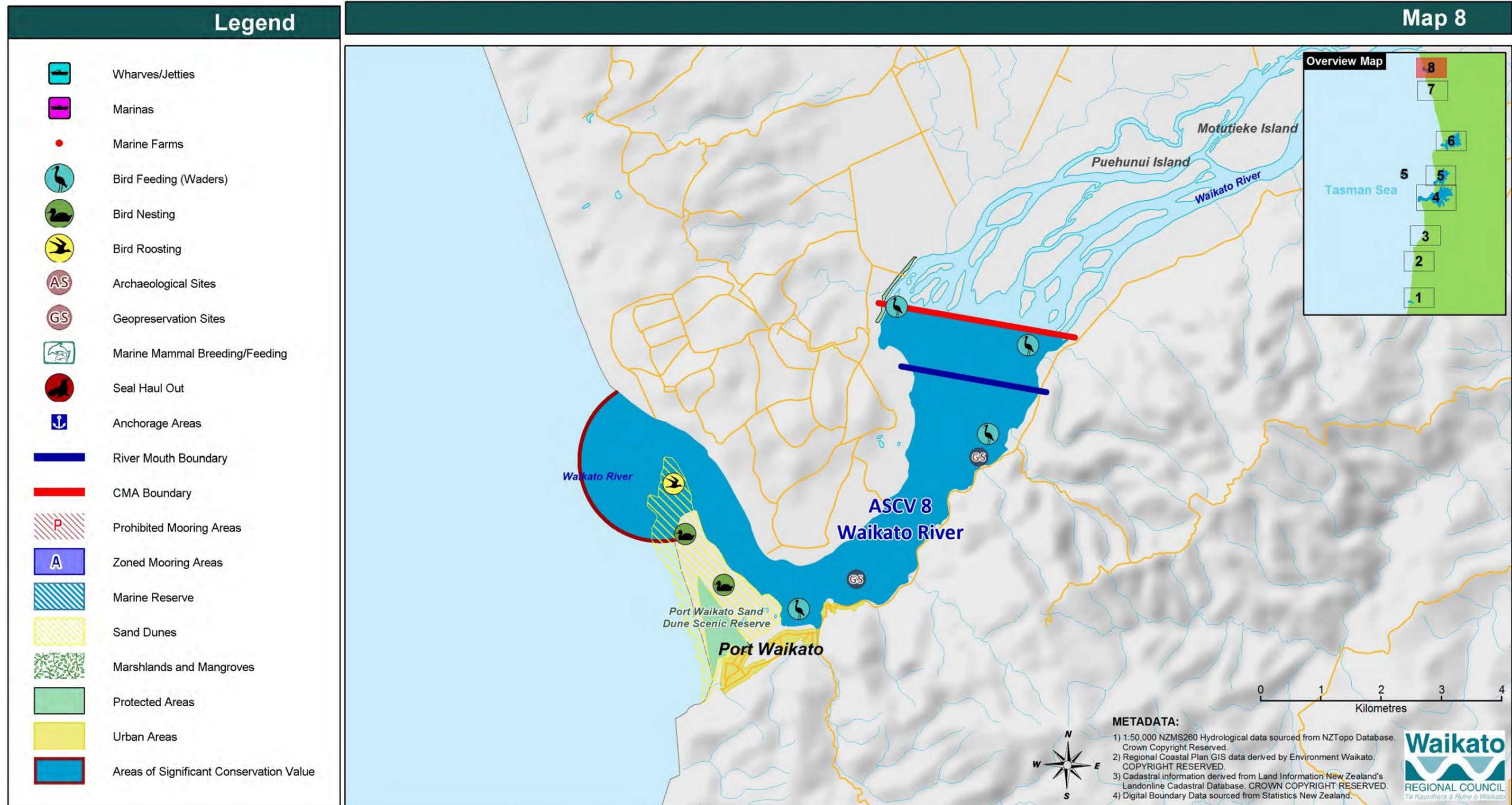
References

2. Doc# 1021525.

3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.

4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Figure 13 Waikato River mouth and estuary



Site 11	Firth of Thames		Risk: High
Classification	Coromandel Peninsula/Intertidal area/ Coastal embayment		
<p>Description</p> <p><i>*Citations noted in brackets.</i></p> <p>The Firth of Thames lies in the northern part of the Hauraki graben and consists of fine clays, silts and sand sediment laid over pumice sands. The shallow tidal flats cover some 8,500 ha and are fringed by mangroves and saltmarsh.</p> <p>The Firth is the largest estuarine embayment in New Zealand and supports New Zealand's largest area of mangroves. The Firth displays four main wetland types, shallow estuarine water and mudflats, shell banks, mangrove forest, saltmarsh and swamp (3).</p>			
Foreshore Type / Environmental Value	Mudflats, mangroves and saltmarsh. Habitat/ Cultural / Food/ Amenity/ Archaeological/ Geopreservation/ Economic		
Map sheets	Topo50- BB34	Topo250- 5	
<p>At risk resources</p> <ul style="list-style-type: none"> - Internationally important wetland (RAMSAR site). It attracts vast numbers of national and international migratory waders (>40,000), many of which are threatened, and is undoubtedly the reason for the extensive fin and shellfish resources within the Firth. 74 species of shorebird, waders and waterfowl frequent or live in the Firth. Those species either threatened or endangered include; fairy tern, black stilt, pied stilt, pied oyster catcher, caspian tern, black billed gull, red billed gull, blue penguin, white fronted tern, flesh-footed oystercatcher, grey plover, Siberian tatler, red necked stint, eastern little tern, white heron, brown teal, variable oystercatcher, sharptailed sandpiper, sanderling, New Zealand dotterel, white-fronted tern, pied shag and wrybill (2) (9). - Pied shag colony at Tararu and Waiomu (18). - Nationally significant mangrove and mudflat communities (2). - Large array of marine mammals including Bryde's whales, bottlenose dolphins and killer whales (3). - Site of cultural significance to Hauraki iwi (2). - Extensive shellfish beds and gathering of shellfish (2). - Recreational uses present in the area include game bird hunting, shellfish gathering, ornithological interest and fishing (1). - Miranda chenier plain and coastal flats (S12 146 469). Unique and globally rare land form (chenier plain), the only known occurrence in the world of a chenier plain gravel ridge association (4). - Archaeological sites are known from the mouth of the Waihou River. - Marine farms present (1). 			
<p>Notes</p> <ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC Area Offices at both Thames and Coromandel), cellphone, marine radio and Waikato Regional Council Radio Network. - Temporary exposure to surface oil is unlikely to impact on mussels although floats and infrastructure will be affected. <p>Actions (preferred protection and clean up options)</p> <ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - NOT an area for dispersant use. Dispersant use should be avoided as the resulting hydrocarbon plume is likely to affect the marine farms as this is likely to result in mortality or tainting of mussels. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this area. Deflection booms are unlikely to be effective along the coastline as the area requiring protection is large. - Clean up of marine farms and the beach along with wildlife rehabilitation will probably be necessary. 			

<p>Endpoint criteria</p> <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area.
<p>Access</p> <ul style="list-style-type: none"> - Boat: Various boat ramps are located along SH25 on the eastern side of the Firth, at Pipiroa on the southern shores, and along Miranda Rd and East Coast Road on the western side of the Firth. - Beach access can be obtained almost anywhere.

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Very likely
On water Recovery	✓		Very likely
Dispersant Application		✓	No
Shoreline Cleanup		✓	Possibly
Natural Recovery	✓		Probably not



Firth of Thames (8).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
9. Doc# 1388718.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Figure 14 Firth of Thames

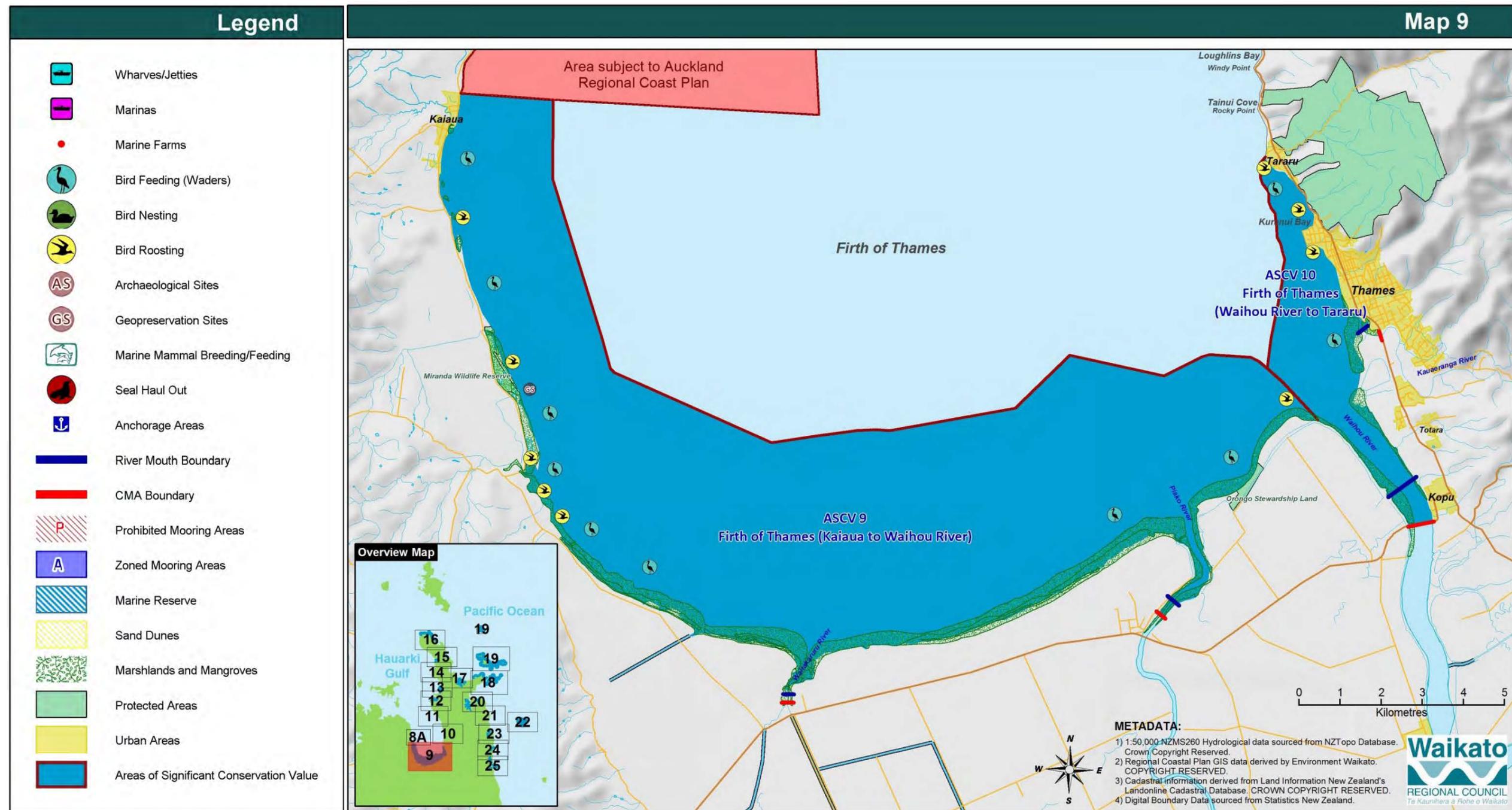


Figure 15 Waiomu Stream

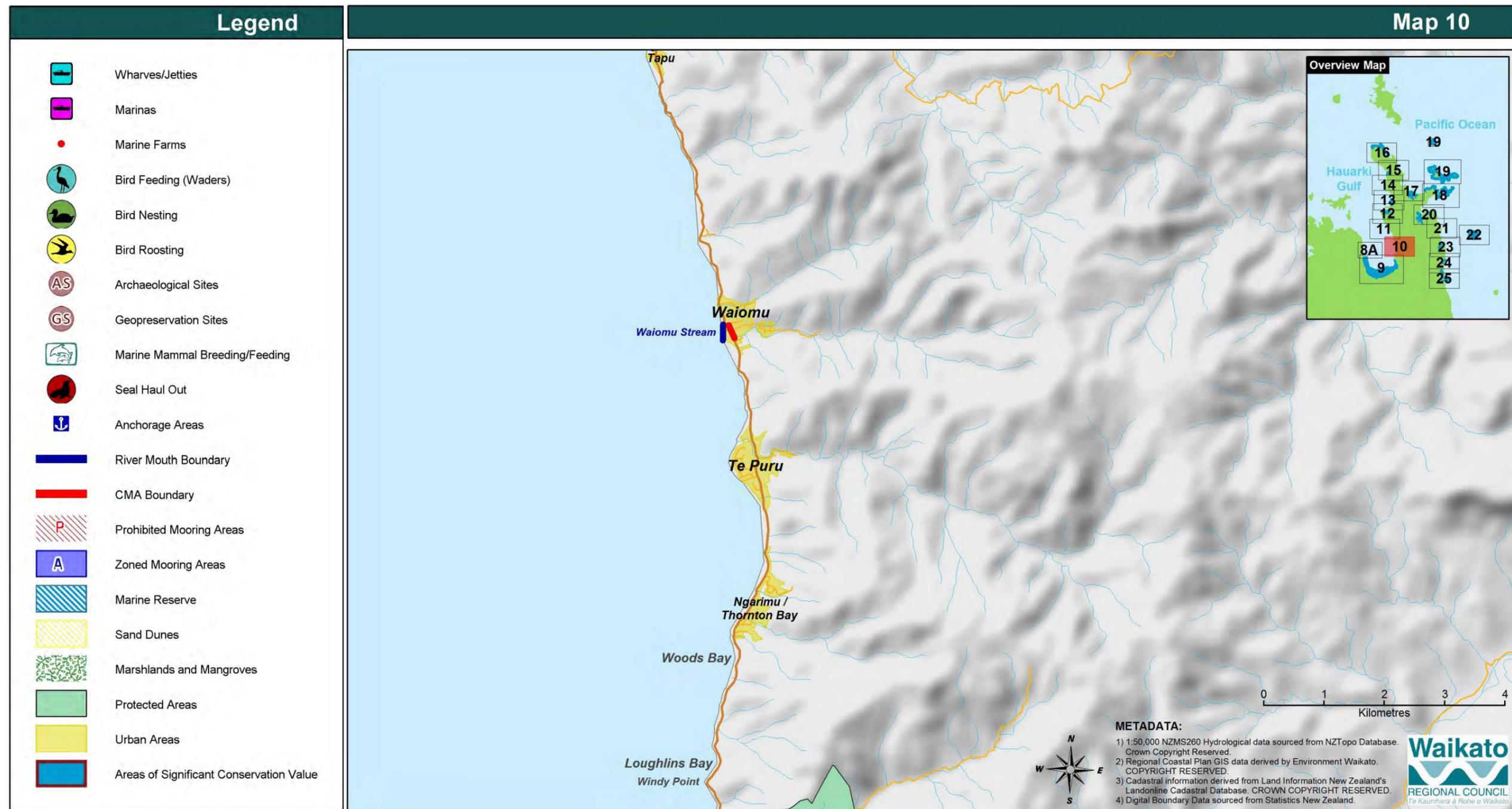
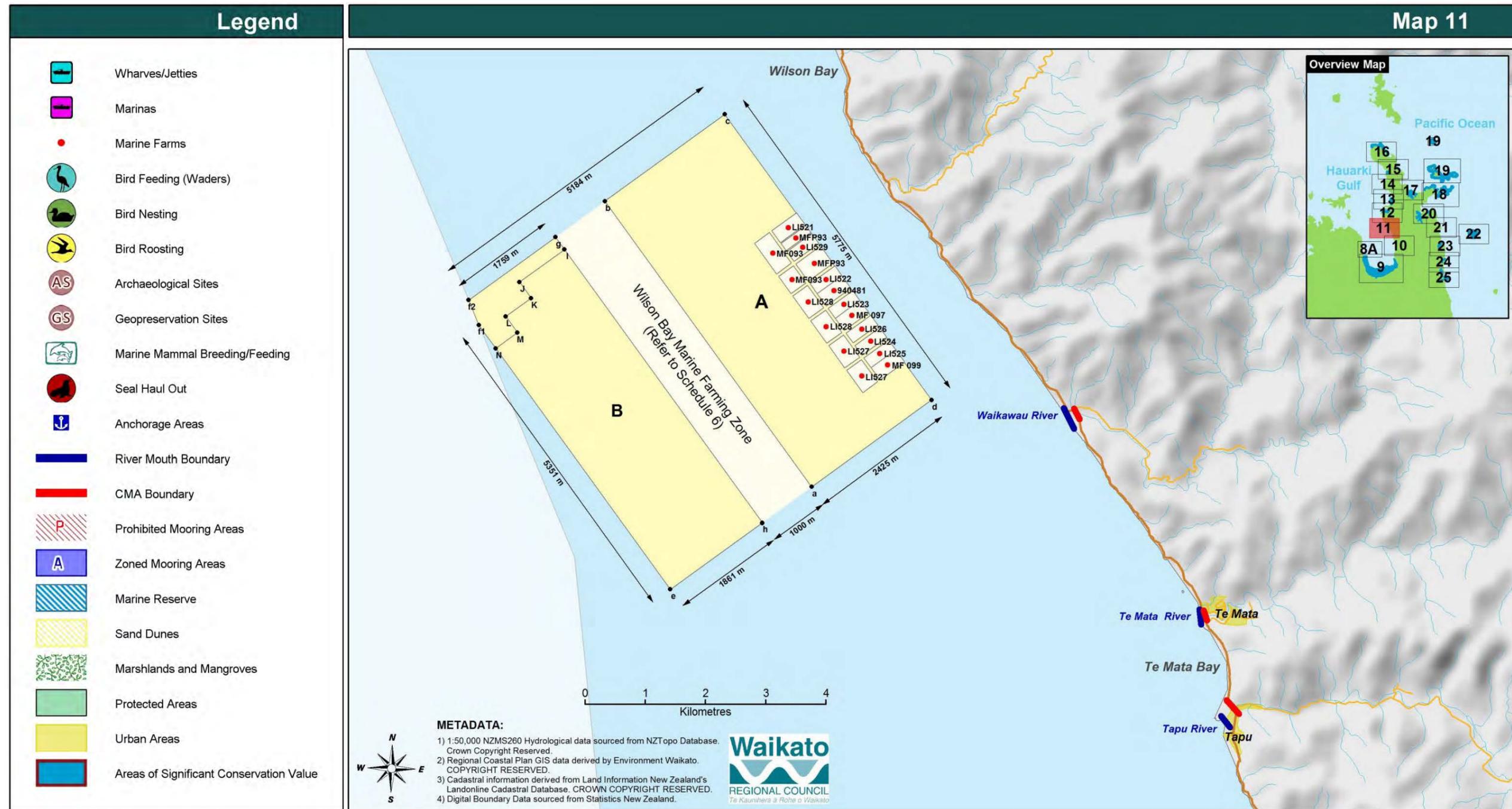


Figure 16 Waikawau River / Te Mata River / Tapu River / Wilson Bay Marine Farming Zone



Site 12	Mania/Te Kouma Harbour		Risk: moderate
Classification	Coromandel Peninsula/ intertidal area/ coastal embayment		
Description <i>*Citations noted in brackets.</i> Mania Harbour This is an unmodified representative estuarine system of 400 ha, fed by the forested Manaia River catchment. It supports extensive areas of mangrove and seagrass and occasional areas of saltmarsh and offers a range of high quality and representative habitats for waders and shorebirds. Te Kouma Harbour An undeveloped area of 250 ha on the Coromandel Peninsula. Much of its catchment is farmland.			
Foreshore Type / Environmental Value	Mud flats, rocky platforms, shelly beaches, mangroves and saltmarsh. Habitat/ Cultural/ Food/ Amenity		
Map sheets	Topo50- BA34	Topo250- 5	
At risk resources <ul style="list-style-type: none"> - Resident and frequenting rare and threatened waders and coastal bird species. Waders regularly recorded at Manaia include the threatened variable oystercatcher, New Zealand dotterel, banded dotterel, caspian tern, eastern bar-tailed godwit, pied stilt, variable oystercatcher, banded rail, Australasian bittern and North Island fernbird (3). - The Manaia catchment area has relatively unmodified freshwater habitats which makes this catchment one of four important areas of the Coromandel Peninsula for diadromous fish including the short-jawed kokopu (3). - Saltmarsh, seagrass and mangrove communities (10). The uncommon sea meadow species sea blite is also present as well as the threatened plants <i>Pomaderris rugosa</i>, Shore spurge and Cook's scurvy grass (3). - Site of significance to Hauraki iwi (2). - An important area for fishing and boating and waka ama (10). - Marine Farms 			
Notes <ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC Area Office), marine radio, cellphone. Actions (preferred protection and clean up options) <ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms may be effectively used along this coastline close to shore as this is a relatively sheltered area. - Prevention of the oil reaching the beach or estuary may also be achieved by the use of dispersants offshore. Dispersant use should be avoided if the resulting hydrocarbon plume is likely to affect the marine farms as this is likely to result in tainting or mortality of mussels. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access <ul style="list-style-type: none"> - Boat: nearest ramps are located near the Coromandel Wharf (off Wynua Bay Rd) and at Te Kouma Wharf (at the end of Te Kouma Rd). 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery	✓		Likely
Dispersant Application	✓		No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Maybe

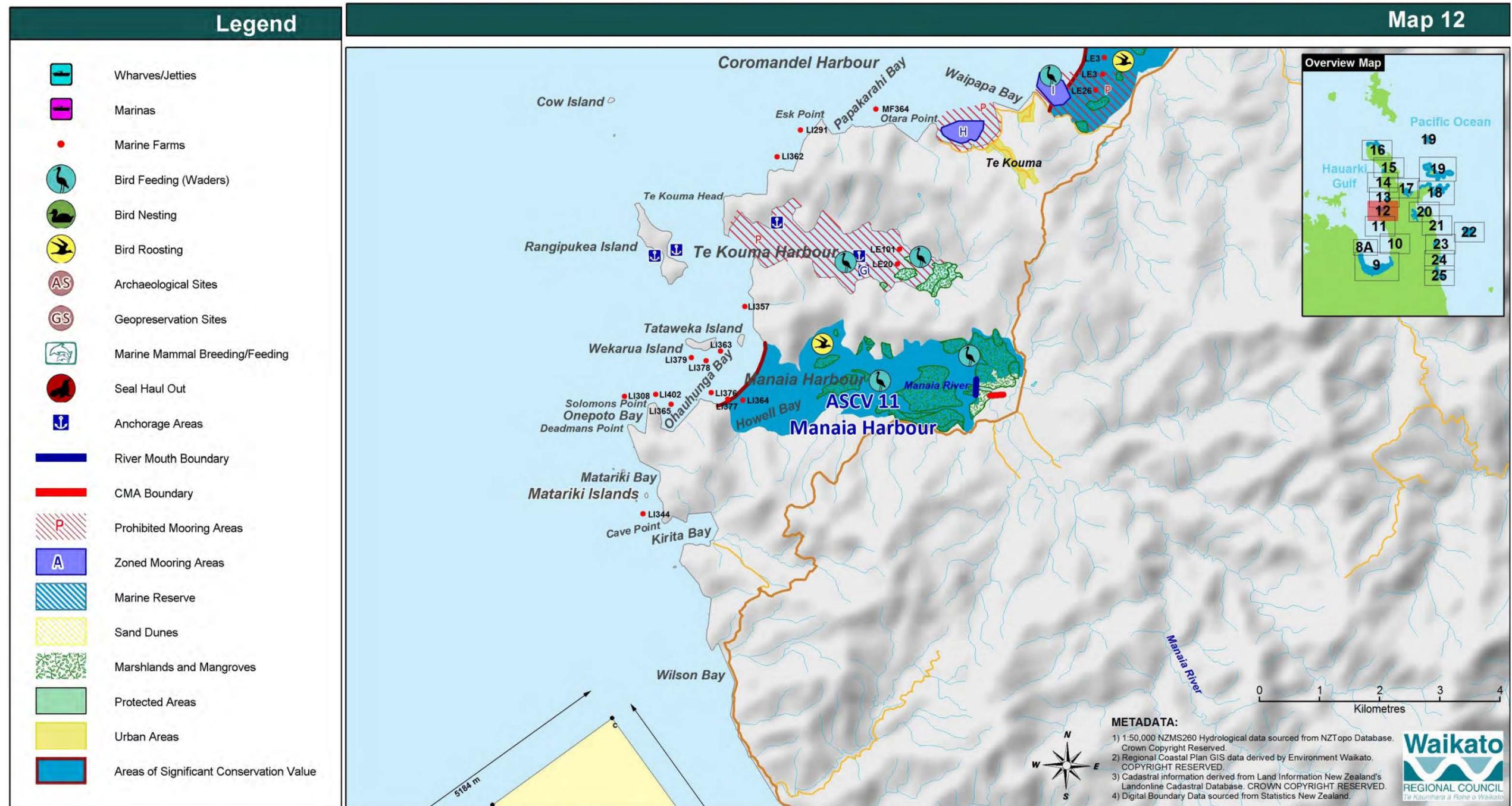


Mania Harbour (3).

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
10. Doc# 1357266.

Figure 17 Manaia & Te Kouma Harbour



Site 13	Coromandel Harbour		Risk: Low
Classification	Coromandel peninsula/ Intertidal area/ Coastal embayment		
Description			
<i>*Citations noted in brackets.</i>			
A large estuarine embayment with extensive intertidal shallows along the eastern margins and pockets of mangroves and saltmarsh. Extensive sea grass beds exist here.			
The mangrove, saltmarsh, sea grass and mudflats offer a diverse range of habitat opportunities for waders, shorebirds, fish and shell fish which are nationally significant.			
Foreshore Type / Environmental Value	Tidal flats and saltmarsh. Habitat/ Cultural/ Food/ Amenity/ Economic		
Map sheets	Topo50- BA34	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Resident rare and threatened wading and coastal bird species, including eastern bar-tailed godwit, pied stilt and North Island fernbird (3). The threatened New Zealand dotterel, caspian tern, white fronted tern, have been reported breeding here, and possibly a breeding place for the variable oystercatcher. Also sustains a breeding colony of the red billed gull. - One of six main flocking sites for New Zealand dotterels on the Coromandel Peninsula (3). - Motuoruhi and Motutapere Islands are predator free (18). - Saltmarsh, seagrass and mangrove communities (2). - Common dolphins are regularly seen in the harbour and killer whales visit occasionally (3). - Threatened estuarine and coastal vegetation includes Cook's scurvy grass, Mawhai, Shore spurge and <i>Pomaderris rugosa</i> (3). - The south side of Preece Point illustrates a complete coastal vegetation sequence (seagrass-mangroves-rushes-coastal scrub- coastal forest) and is ecologically important (3). - Site of significance to Hauraki iwi (2). - Nationally significant recreational values (fishing, diving, boating and shellfish gathering) (1). - Marine Farms (1). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC area office), marine radio, cellphone. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms may be used along this coastline close to shore as this is a relatively sheltered area. - Prevention of the oil reaching the beach or estuary may also be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: ramps are located near the Coromandel Wharf (off Wynua Bay Rd) and at Te Kouma Wharf (at the end of Te Kouma Rd). 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery		✓	Likely
Dispersant Application		✓	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Probably not



Coromandel harbour (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Figure 18 Inner Coromandel Harbour

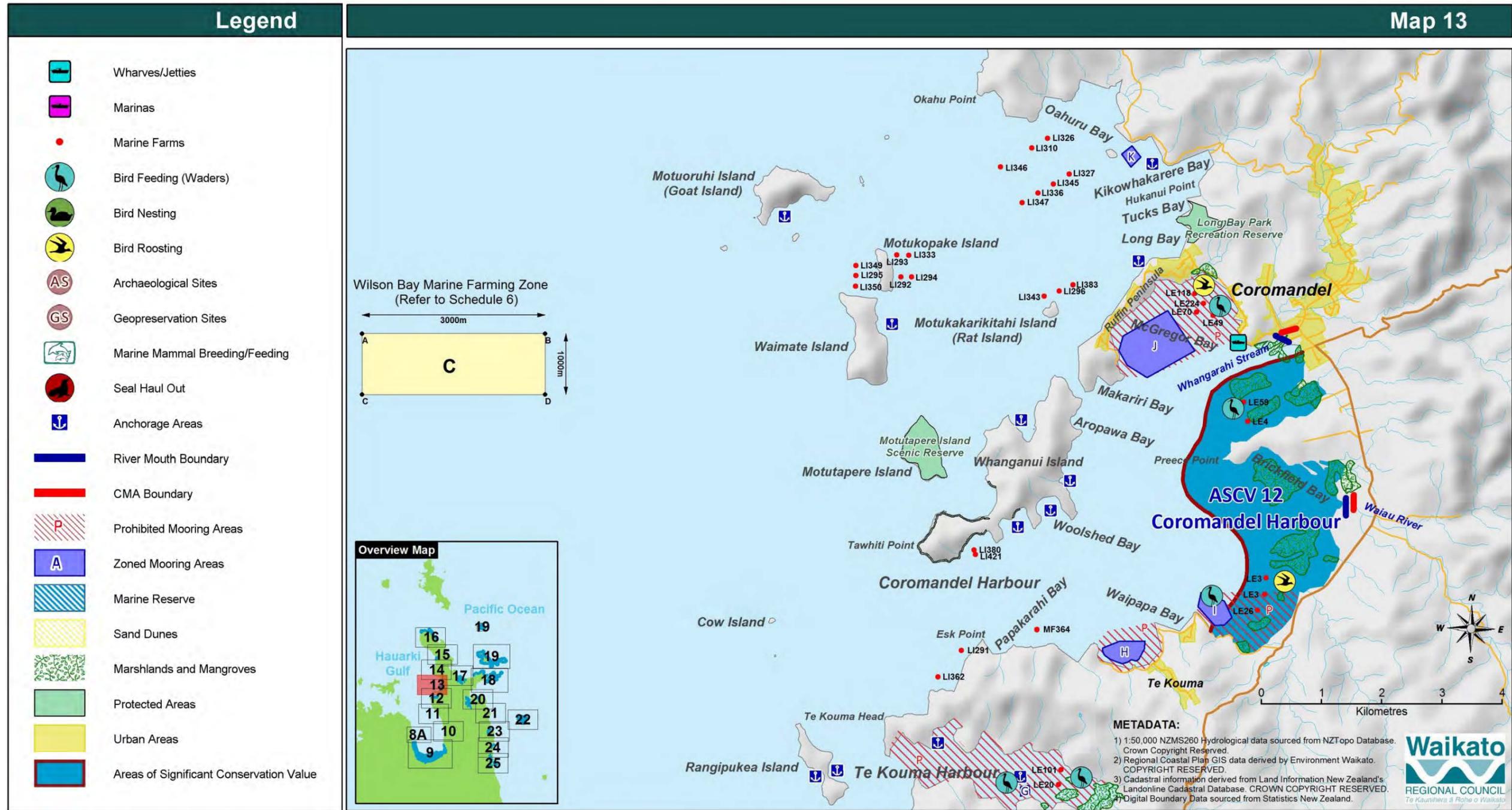
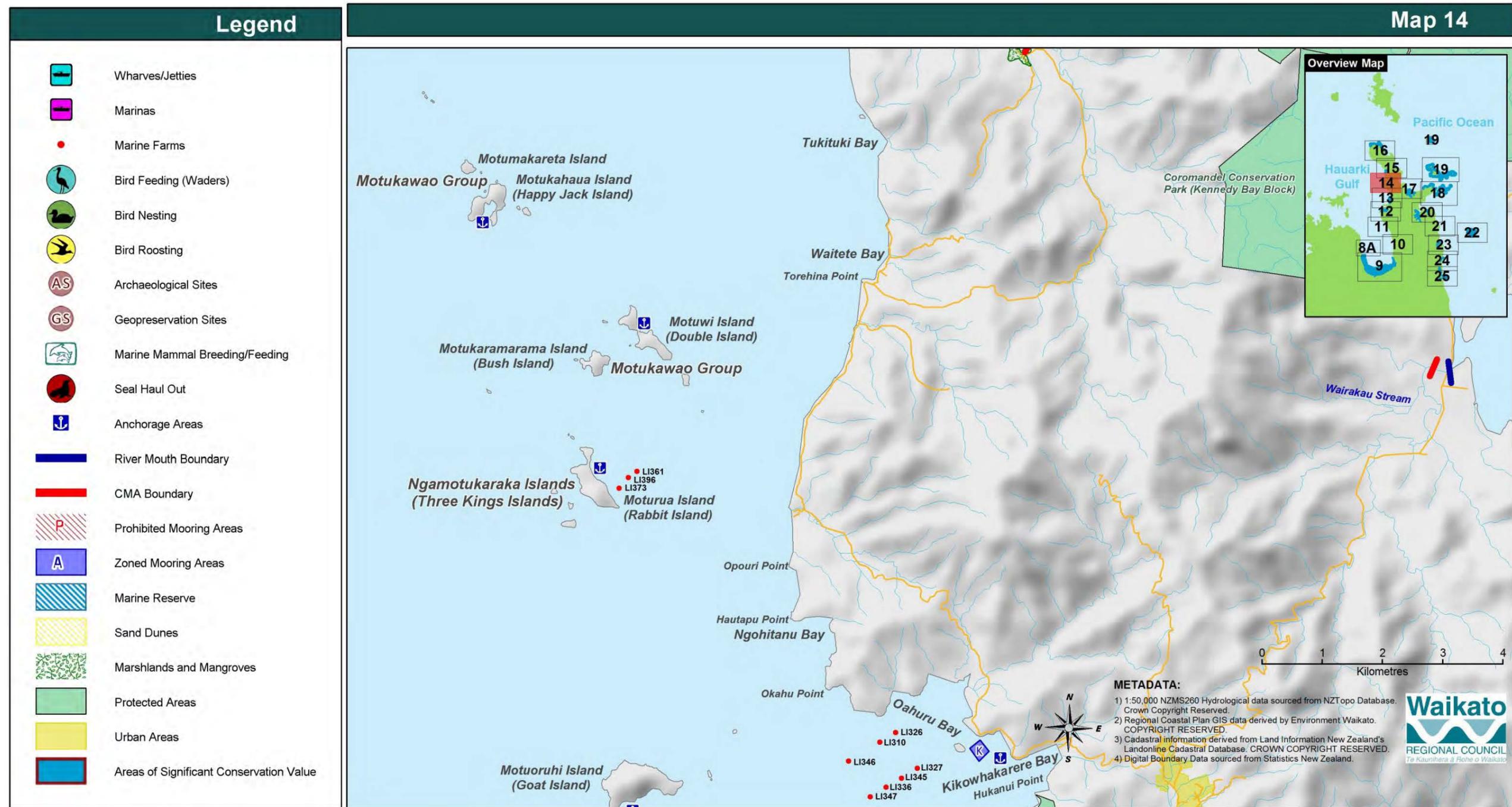


Figure 19 Wairakau Stream



Site 14	Colville Bay		Risk: moderate
Classification	Coromandel Peninsula/ Intertidal area/ Coastal embayment		
Description			
<i>*Citations noted in brackets.</i>			
A shallow 190 ha estuarine embayment, with scattered mangrove and saltmarsh communities around the fringes, sandflats, shingle, shellbanks and mudflats as well as a small dune system.			
Foreshore Type / Environmental Value	Estuary, sand and shell banks and intertidal flats. Habitat/ Cultural/ Food/ Amenity/ Archaeological		
Map sheets	Topo50- BA34	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Described as a site of special wildlife interest (3). Significant breeding site for NZ dotterel (2) with up to 12 breeding pairs (MOSCP). Reef heron, caspian tern, banded rail, variable oystercatcher and international migrants regularly recorded. - Resident and frequenting threatened and rare waders, coastal and freshwater bird species (2). The sand and shell banks along the inner southern shoreline offer ideal nesting and roosting sites for waders and the intertidal sand and mudflats are feeding sites. - The rivermouth in the north-east corner of Whangaahei Bay is an important Pateke (brown teal) flock site. - Site of significance to Hauraki iwi (2). - A nationally significant recreational site. Boating and fishing activities take place in this bay (1). - Nationally significant archaeological sites (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via marine radio and cellphone (very marginal). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms may be used along this coastline close to shore as this is a relatively sheltered area. - Prevention of the oil reaching the beach or estuary may also be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: ramp (for small vessels) is located on wharf road. - Vehicle: beach access can be gained anywhere along Colville Rd (at the Bay). 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Yes
On water Recovery		✓	Yes
Dispersant Application		✓	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Maybe



Oystercatchers at Coville Bay (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.

Site 15	Cape Colville/Sandy Bay		Risk: moderate
Classification	Coromandel Peninsula/ Subtidal area/ Coastal Environment		
Description			
<i>*Citations noted in brackets.</i>			
An unmodified and diverse coastline adjoining the Port Jackson, Fletchers Bay and Stony Bay Recreation Reserve. The coastline is representative of the Coromandel Peninsula and forms part of the Moehau Ecological District. The coastline between Stony Bay and Sugar Loaf Rocks is under consideration for marine protection.			
Foreshore Type / Environmental Value	Coast cliffs, rocky shores, near shore reefs, boulder and sandy beaches. Habitat/ Cultural/ Amenity/ Geopreservation/ Archaeology		
Map sheets	Topo50- BA34 and AZ34	Topo250- 5 and 3	
At risk resources			
<ul style="list-style-type: none"> - Adjoining Cape Colville Farm Park, Recreation Reserve (2). - Resident rare and threatened wading and coastal bird species (2). - Breeding grounds for Variable oystercatcher at Port Jackson and Port Charles (3)(18). - Killer whales and bottlenose dolphins regularly visit the area (3). - Unique subtidal environs (2). - Nationally significant coastal landscape (2). - Site of significance to Hauraki iwi (2). - Geopreservation sites: Sugar Loaf (S09 265 227), Fletchers Bay Waitemata Group sedimentary sequence (S09 254 224) (4). - Archaeological sites of 'Archaic' period species (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via marine radio and cellphone (very patchy) 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the shore may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: access may be available at the old wharf located at Port Jackson, and a boat ramp possibly exists at Port Charles. - Vehicle: beach access can be made at various points along Stony Bay Rd from the eastern side, and Fletcher Bay Rd from the western side. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Yes
On water Recovery		✓	Yes
Dispersant Application		✓	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Maybe



Sandy Bay (3).

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Site 16	Waikawau Bay/Estuary		Risk: High
Classification	Coromandel Peninsula/ Subtidal area/ Coastal environment		
Description			
<i>*Citations noted in brackets.</i>			
A small estuary at the north of Waikawau River and a shelving sandy beach, backed by a large dune system running the entire length of Waikawau Beach. Representative estuarine system with largely unmodified coastal forest, mangrove, saltmarsh and seagrass communities.			
Foreshore Type / Environmental Value	Sandy beach, dune system and tidal lagoon. Habitat/ Cultural/ Food/ Amenity/ Archaeological/ Geopreservation		
Map sheets	Topo50- AZ34	Topo250- 3	
At risk resources			
<ul style="list-style-type: none"> - Resident and frequenting rare and threatened wading and coastal bird species. It is a breeding and feeding site for the threatened New Zealand dotterel, banded dotterel, variable oystercatcher. - Key breeding site for New Zealand dotterel, including at Tairuru Bay (11)(18). - The Waikawau Bay estuary is an important pateke (brown teal) flock site. - Coastal foredunes in the middle of Waikawau Bay host a population of dune snail (12). - Nationally important seascape (2). - Regionally significant dune system fronting Waikawau Bay that hosts a representative dune species community (3). It is a site of significance to Hauraki iwi (3) and component of the nationally significant Moehau Land Unit. - Adjoining Waikawau Farm Park recreational reserve (2). A very popular holiday/camping site and is used for beach walking, fishing and boating. - Archaeological sites (1). - Geopreservation sites: Waikawau Bay coastal features (T10), one of the few pristine, undeveloped white sandy beaches and associated coastal features on the Coromandel Peninsula. Wakawau Beach Miocene Sediments (R17) (4) 			
Notes			
<ul style="list-style-type: none"> - Communications via marine radio and cellphone (very marginal). 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering estuary at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: ramp located at Kennedy Bay (the next bay south). - Vehicle: beach access via Waikawau Bay Rd. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Maybe
On water Recovery		✓	Not very likely
Dispersant Application		✓	Probably no point
Shoreline Cleanup	✓		Most likely on beach
Natural Recovery	✓		Maybe



Waikawau Bay (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
11. **Dowding, J.E.** *Management of New Zealand dotterels on Coromandel Peninsula.* Wellington : Department of Conservation, 2006.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Figure 20 Colville Bay / Waikawau Bay

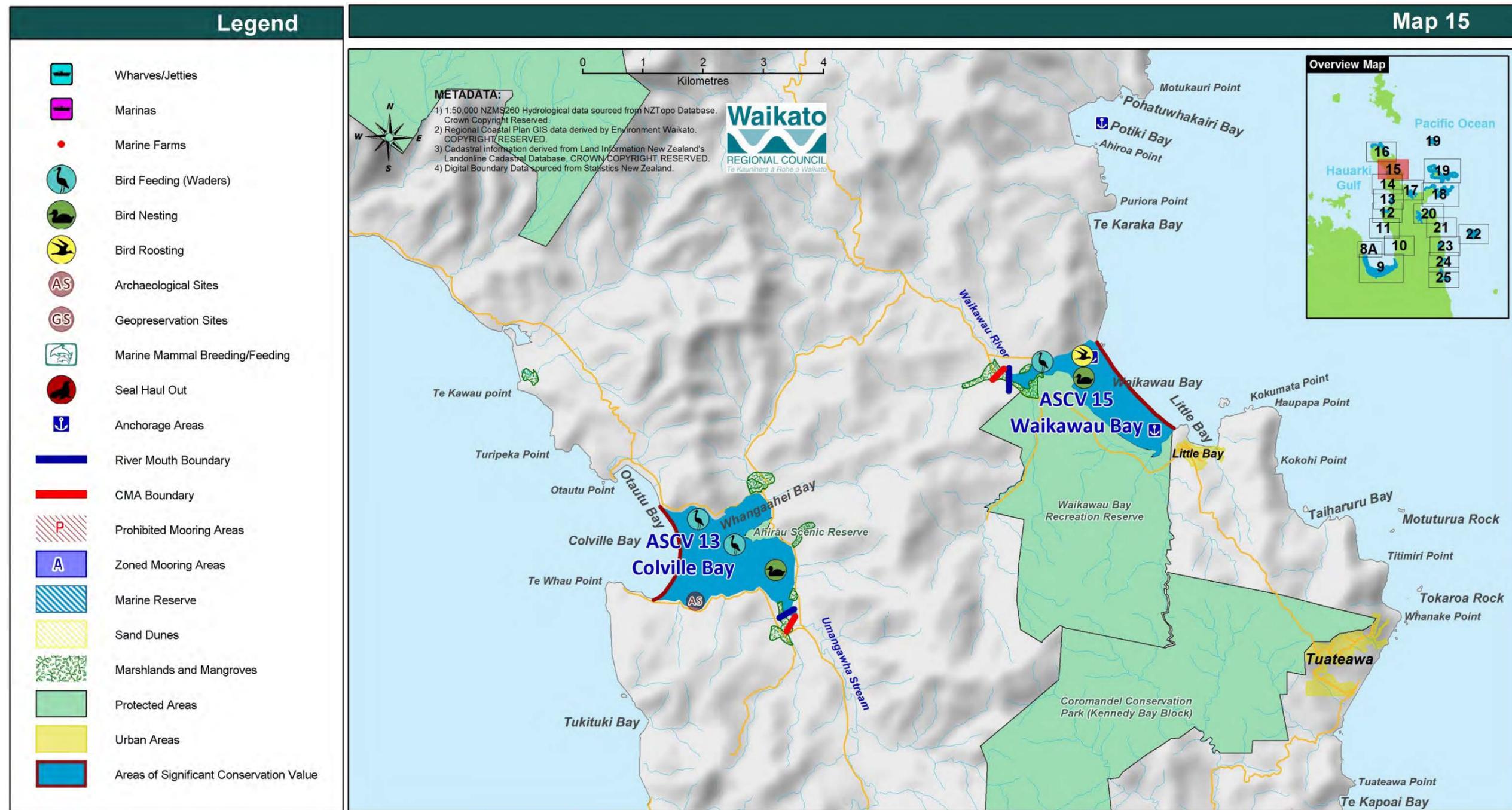
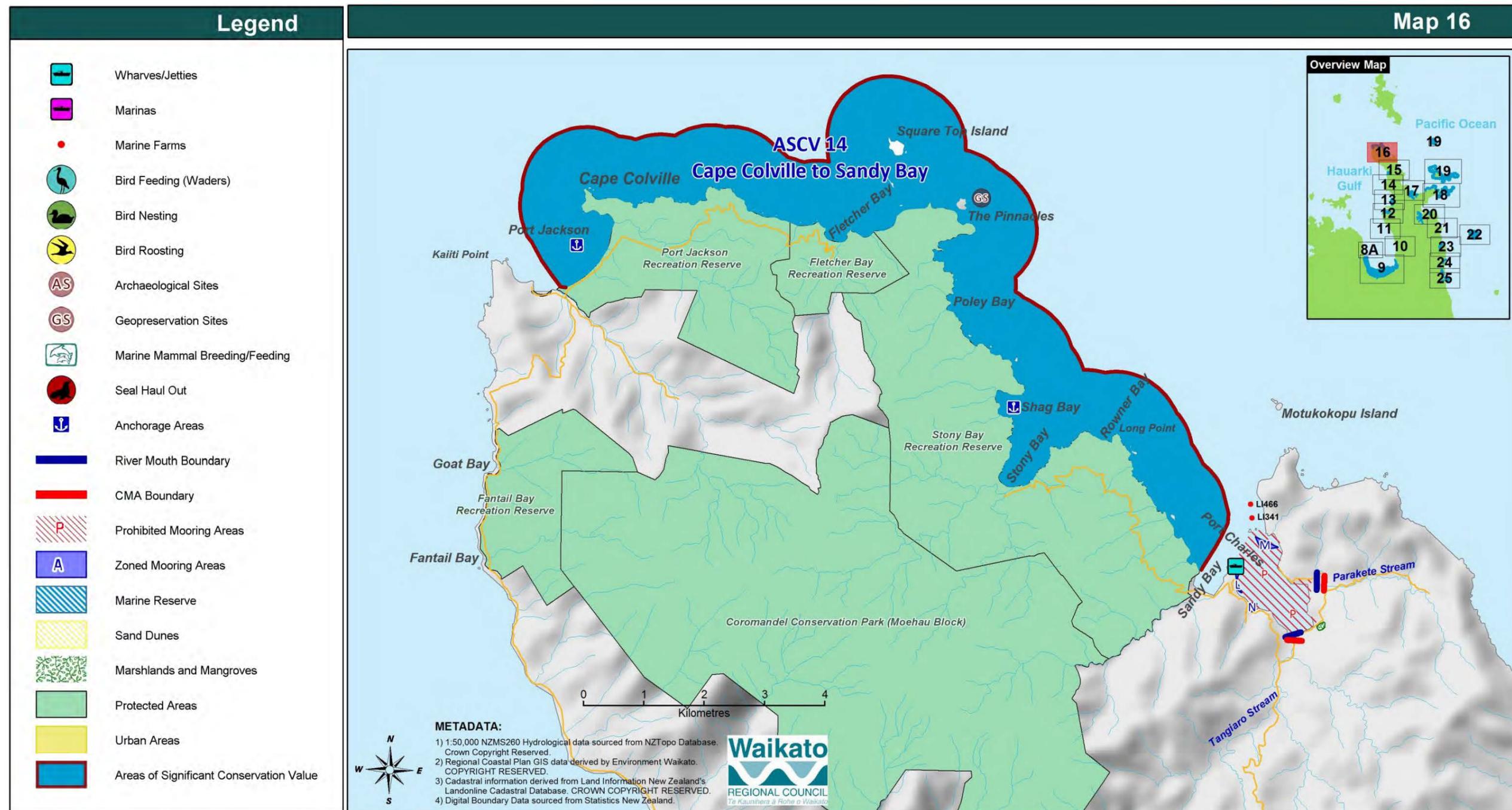


Figure 21 Cape Colville to Sandy Bay



Site 17	Whangapoua Harbour		Risk: High
Classification	Coromandel peninsula/ Intertidal area/ Tidal lagoon		
Description			
<i>*Citations noted in brackets.</i>			
A large diverse estuarine ecosystem relatively unmodified, which provides habitat for a wide range of wading and coastal bird fauna. Extensive mangroves, saltmarsh, seagrass beds and intertidal mud/sand flats can be found, supporting a variety of threatened wildlife.			
Foreshore Type / Environmental Value	Tidal lagoon and flats, mangroves, saltmarsh, and seagrass beds.		
	Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeology		
Map sheets	Topo50- BA35	Topo250- 5	
At risk resources			
<ul style="list-style-type: none"> - Nationally important habitat for wildlife (2). - Matarangi spit and Opera Spit are the most important New Zealand dotterel breeding sites on the Coromandel Peninsula and a site of national importance (3). - Resident and frequenting rare and threatened wading, coastal and freshwater bird species (2). Whangapoua Harbour, Matarangi Beach and other nearby beaches are important feeding and/or breeding sites for New Zealand dotterel, variable oyster catcher, and banded dotterel. Reef heron, caspian tern, North Island fernbird and banded rail are regularly recorded. International migrants like bartailed godwit are also present in significant numbers. - The harbour represents the best and largest estuarine system in the ecological district – largely unmodified with significant saltmarsh, seagrass and mangrove communities (2). - Extensive shellfish beds. Good diversity of macrofauna – including: bivalves, horse mussels, cockles, pipis, native rock oysters, mussels, polychaetes, crustaceans, snails (1). - Site of significance to Hauraki iwi (2). - Of regional significance for boating, fishing, shellfish gathering and game bird hunting (2). - Geopreservation sites: Omara spit landform (T10 474 930) and Whangapoua columnar jointed basalt (4). - A number of archaeological sites around harbour margins (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via cellphone (marginal in places) and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: ramp located at wharf. - Vehicle: various points around the harbour for beach access. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery	✓		Maybe
Dispersant Application		✓ (Offshore or outgoing tide)	No
Shoreline Cleanup		✓	Most likely
Natural Recovery	✓		Maybe

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Site 18	Kuaotunu Peninsula		Risk: Low
Classification	Coromandel Peninsula/ Subtidal area/ Coastal environment		
Description <i>*Citations noted in brackets.</i> An extensive area (~25km) of predominantly rocky coastline, with rock stacks wave platforms, cliffs and sandy beaches. Representative coastal landscape.			
Foreshore Type / Environmental Value	Rocky coastline, with rock stacks, wave platforms, cliffs and sandy beaches. Habitat/ Cultural/ Food/ Amenity/ Geopreservation		
Map sheets	Topo50- BA35 and BA36	Topo250- 5 and 6	
At risk resources			
<ul style="list-style-type: none"> - Significant roosting and breeding sites for migratory birds and small populations of threatened wildlife, including the NZ dotterel and variable oyster catcher (2). - Otama beach and Opito Beach are important New Zealand dotterel breeding sites; New Zealand dotterel also breed at Matapaua, Waitaia, Woodcock and Whauwhau. - Opito Bay may function as a nursery habitat for juvenile fish species that migrate to the Mercury Islands when they become adults (3). - Common and bottlenose dolphins with calves are seen quite regularly off Opito beach (3). - Threatened estuarine and coastal vegetation include Golden sand tussock, Pinago and Dwarf mistletoe (3). - Site of cultural and spiritual significance to Hauraki iwi (2). - Extensive shellfish beds and shellfish gathering (2). - Fishing takes place off most points where access is available. - Geopreservation sites: Otama relict dunes (T10) and Opito Point Basalts (T10) (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (local residents), cellphone (marginal in confined places) and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along this coastline close to shore, unless the sea state is calm, as the area is exposed and subject to rough seas. Prevention of the oil reaching the beach or sandy bays may best be achieved by the use of dispersants offshore. - Pre-emptive capture NZ Dotterels (min 48 hrs notice if possible). Operations to be informed by Wildlife due to the possible presence of these endangered birds (Note: this is from the Maritime NZ Site sheets) - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Water: Nearest boat ramp is located at Matarangi on the north side of the peninsula, and Whitianga on the south side. Boat access may also be available from Opito Bay (depending on the swell conditions). Also a small boat ramp at Kuaotunu. - Road: The main access route is Blackjack Road (unsealed and prone to flooding/landslips). 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Maybe
On water Recovery		✓	Maybe
Dispersant Application	✓ (High flow and offshore only)		No
Shoreline Cleanup	✓ (Sandy)	✓(Rocky)	Most probable
Natural Recovery	✓		Maybe



Looking northwest along Opito Bay, part of the Kuaotunu Peninsula (3).

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Site 19	Ohinau Island Group		Risk: moderate
Classification	Coromandel Peninsula/ Subtidal area/ Offshore Island		
Description			
<i>*Citations noted in brackets.</i>			
The smaller islands in this group have remnant and unique coastal forest, diverse invertebrate and reptile fauna. These islands have great potential for becoming established island refuges for endangered and threatened species. Ohinauti and Ohinau Island are predator free. Very high ecological area.			
Foreshore Type / Environmental Value	Rocky shore Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BA35 and BA36	Topo250- 5 and 6	
At risk resources			
<ul style="list-style-type: none"> - Significant colonies of sea birds, with many bird species known to breed on the islands, including petrel and shearwater (3)(18). - Rare and threatened fauna. Islands of less than 3 ha are likely to have Tuatara, Tusked Weta and lizards which commonly use the tidal zone (2) (18). - Rare and threatened flora including shore spurge, Mawhai and Large-leaved milk tree (3). - Nationally significant seascape (2). - Sites of significance to Hauraki iwi (2). - Of regional significance for fishing, diving and boat charters. - Ohinau Island columnar rhyolite (T10 673 929) (4). - Regionally significant archaeological sites (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Any teams visiting the islands will need to work with DoC to ensure that no pests are introduced. - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from washing onto the islands. Deflection booms are unlikely to be effective along the coastline close to islands unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the shore may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: there are boat launching facilities at Whitianga. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Not very likely
On water Recovery		✓	Maybe
Dispersant Application	✓(High flow and offshore only)		Maybe
Shoreline Cleanup	✓(Sandy)	✓(Rocky)	Possibly
Natural Recovery	✓		Yes

References

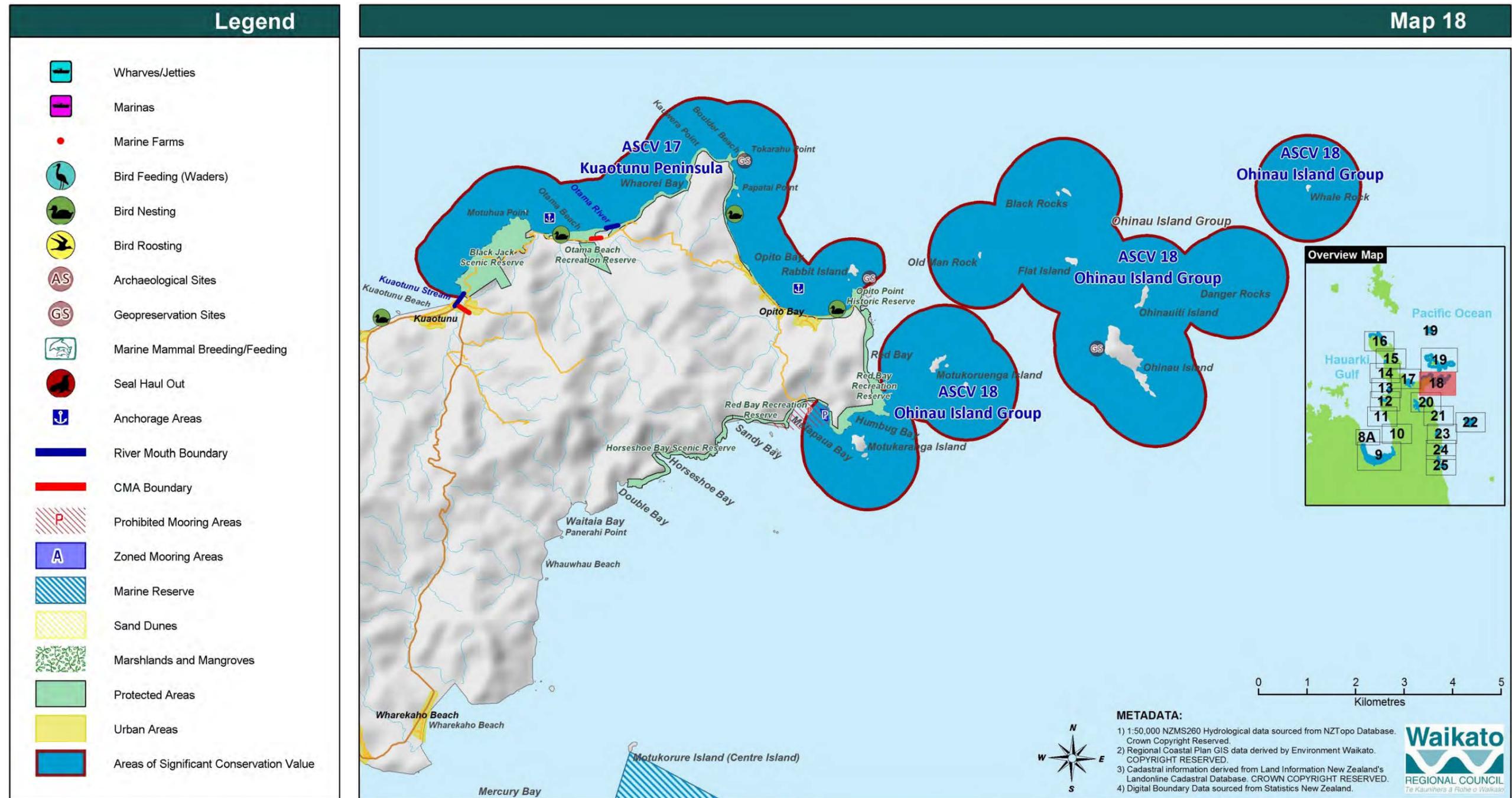
2. Doc# 1021525.

3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.

4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

18. **Chappell, R.** Department of Conservation. *Personal communication.*

Figure 23 Kuaotunu Peninsula / Ohinau Island Group



Site 21	Mercury/Cuvier Island		Risk: moderate
Classification	Coromandel Peninsula/ Subtidal area/ Offshore Island		
Description			
<i>*Citations noted in brackets.</i>			
Offshore islands and rock stacks, including Koropuki Island, Green Island, Middle Island, Stanley Island, Double Island, Red Mercury and Great Mercury Islands and Cuvier Island.			
Remnant coastal flora and fauna communities are now confined to these offshore islands.			
Foreshore Type / Environmental Value	Rocky and sandy shores Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeology		
Map sheets	Topo50- AZ36	Topo250- 3, 5 and 6	
At risk resources			
<ul style="list-style-type: none"> - Islands and rock stacks are gazetted reserves (2). - Significant colonies of burrowing sea birds (2). - Rare and threatened sea and coastal bird species (2) including New Zealand dotterels. - A breeding site for New Zealand dotterels, little blue penguin, grey faced petrel, diving petrel, fluttering shearwater, North Island saddleback, pied shag, and little shag (3)(18). - Little spotted kiwi are present on Red Mercury Island (2). - Rare and threatened lizard and insect species (2). Diverse rare invertebrate and reptile fauna including tuatara, Mercury Island Tusked Weta, Whitikers skink, robust skink, tuatara, shore skink, egg laying skink, marbled skink, duvacells gecko, pacific gecko, moko skink, and rare weta beetle (13)(18). - Threatened plants including Large-leaved milk tree, Mawhai, Parapara, Pimelea tomentosa, and Cook's scurvey grass (3). - Nationally significant seascape (2). - Islands managed as refuges for endangered fauna (2). - Rare permanently submerged population of seagrass (14). - Sites of significance to Hauraki iwi (2). - National importance for recreation, fishing, diving and boat charters. - Geopreservation sites: Cuvier Island tourmalinised rocks (T09 584 257). Red Mercury Island basalt (U10 732 052). Stanley Island basalt vents and cone (T10 687 025). White cliffs, Great Mercury (T10 620 057) (4). - Regionally significant archaeological site (2). Of historical significance is the whaling station on Great Mercury Island. 			
Notes			
<ul style="list-style-type: none"> - Highly sensitive ecology which is completely dependent on the seabirds. - Communications via cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Any teams visiting the islands will need to work with DoC to ensure that no pests are introduced. - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering any bay at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Pre-collection of NZ Dotterel where possible. - Where possible, oil should be prevented from washing onto these islands. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. Prevention of the oil reaching the shore may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			

Access

- **Boat:** nearest ramps are located at Whangapoua and Whitianga Harbours.

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	In areas
On water Recovery		✓	Maybe
Dispersant Application	✓ (High flow and offshore only)		Maybe
Shoreline Cleanup		✓	Possibly
Natural Recovery	✓		Possibly

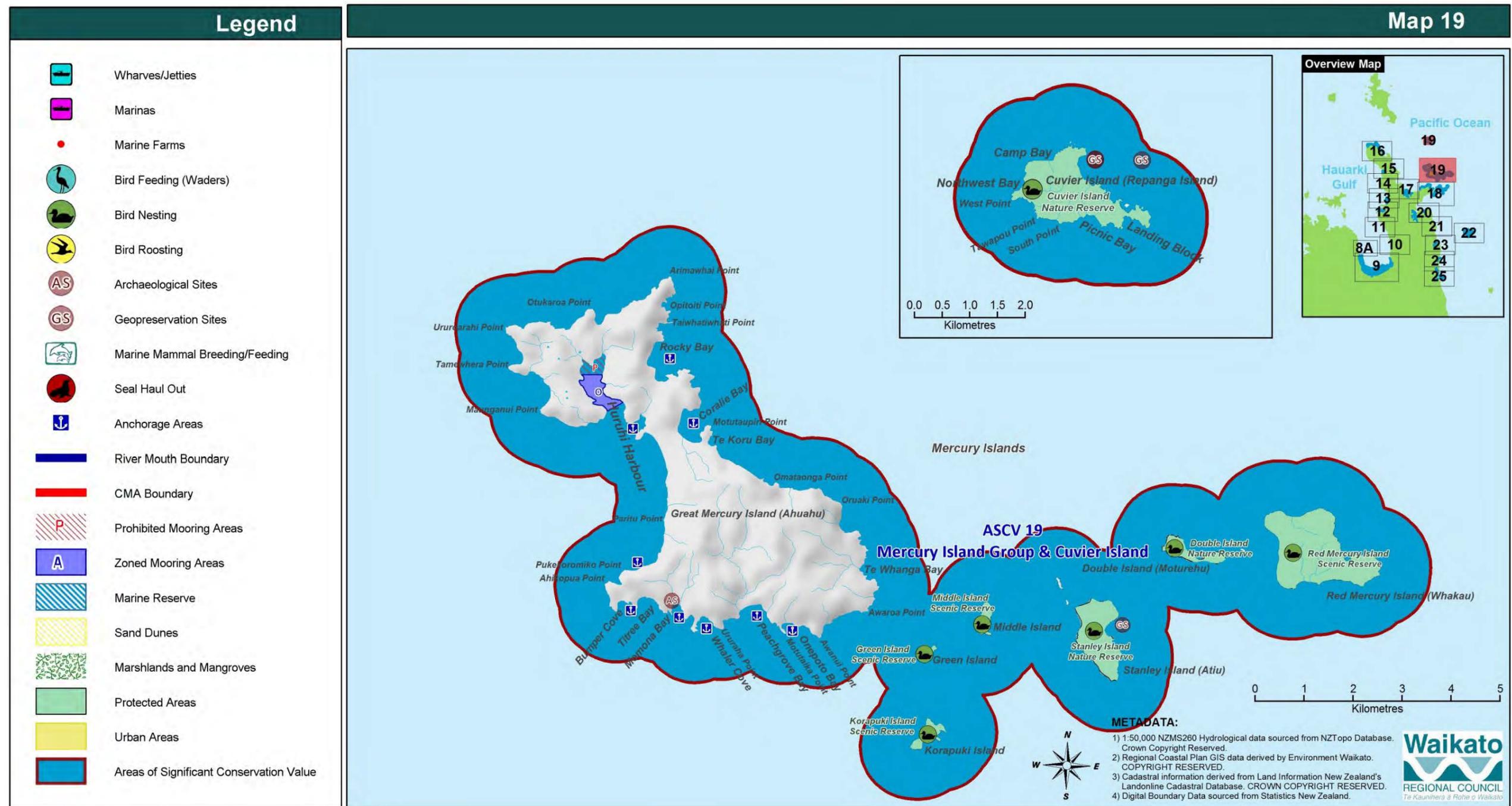


Curvier Island (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
13. Atlas of the amphibians & reptiles of New Zealand. *Department of Conservation.* [Online] <http://www.doc.govt.nz/conservation/native-animals/reptiles-and-frogs/reptiles-and-frogs-distribution-information/atlas-of-the-amphibians-and-reptiles-of-nz/>.
14. **Schwarz, A., Morrison, M., Hawes, I., & Halliday, J.** *Physical and biological characteristics of a threatened marine habitat: sub-tidal seagrass beds of offshore islands.* Wellington : Department of Conservation, 2006.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Figure 24 Mercury Island group and Cuvier Island



Site 22	Whitianga Harbour		Risk: moderate
Classification	Coromandel peninsula/ Intertidal area/ Tidal lagoon		
Description			
*Citations noted in brackets.			
A large estuarine ecosystem fringed by mangroves, saltmarsh and pockets of coastal forest. Extensive intertidal mud/sand flats, seagrass bed and mangrove forests are utilised by a varied array of marine life and coastal wildlife including the only estuarine inhabiting common dolphin known in New Zealand. The harbour is of national importance.			
Foreshore Type / Environmental Value	Tidal lagoon, mangrove, saltmarsh. Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BA35 and BA36	Topo250- 5 and 6	
At risk resources			
<ul style="list-style-type: none"> - Nationally important wildlife habitat (2). - Resident and frequenting rare and threatened wading, coastal and freshwater bird species. Threatened reef heron, caspian tern, variable oystercatcher, New Zealand dotterel, breeding colonies of pied and little shags (2). - New Zealand dotterels breed on Buffalo Beach and Hot Water beach and use the harbour for feeding at low tide (3). - Dolphins and killer whales visit the harbour to feed (3). - Threatened plants include Pingao, Cook's scurvey grass, Large-leaved milk tree, <i>Pomaderris rugosa</i>, Sand daphne and <i>Olearia pachyphylla</i> (3). - Extensive seagrass and mangrove communities (3). - Resident common dolphins (2). - Site of significance to Hauraki iwi (2). - A nationally important area for boating, fishing, shellfish gathering and pleasure cruising. - Adjoining forest scenic reserves (2). - Geopreservation sites: Maramaratotara Bay coastal features (T11 529 819), Shakespeare Cliff clastic dikes (T11 534 820) and Whitianga Ferry Landing ignimbrite (T11 522 818) (4). - Archaeological sites: The historic wharf site opposite the existing wharf and the kauri booms at Back Bay are of historical importance. The Whitianga Ferry Landing stone wharf is the oldest stone wharf in New Zealand (T11 523 818) (2), (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC area office), cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Water: Via main wharf for boats. - Road: Various road access points around harbour. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current area
On water Recovery	✓		Maybe
Dispersant Application		✓ (Outgoing tide)	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Not likely



Whitianga harbour (3).

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Site 23	Purangi Estuary and Te Whanganui-a-Hei Marine Reserve		Risk: moderate
Classification	Coromandel Peninsula/ Subtidal area/ Coastal environment		
Description			
<i>*Citations noted in brackets.</i>			
<p>Purangi: A very small relatively unmodified estuarine ecosystem fringed by mangroves and salt marsh. The extensive inter-tidal mud/sand flats, seagrass bed and mangrove forests, are utilised by a varied array of marine life and coastal wildlife.</p> <p>Te Whanganui-a-Hei Marine Reserve: This 9.5 km² marine reserve encompasses five near shore islands, several rock stacks and the coastline between Cooks Bluff and Hahei Beach. It is an area of complex, high quality subtidal and intertidal habitats, including sponge garden, hard reef and soft sediment communities and has diverse communities of plants, crustaceans, molluscs and fish.</p>			
Foreshore Type / Environmental Value	Tidal lagoon. Extensive inter-tidal mud/sand flats, Sea grass bed and mangrove forests, and rocky foreshore		
	Reserve/ Habitat/ Cultural/ Food/ Amenity/ Geopreservation		
Map sheets	Topo50- BA36	Topo250- 5 and 6	
At risk resources			
<ul style="list-style-type: none"> - Significant marine breeding ground, adjacent to the Te Whanganui-a-Hei Marine Reserve (2). - Significant mangrove communities, saltmarsh and areas of seagrass and freshwater wetlands (1). - Nationally important for resident and frequenting, rare and threatened birds including as a breeding site for black-backed gull and variable oystercatcher. Birds reported using the Purangi estuary includes New Zealand dotterel, Caspian tern and North Island fern bird (3). - Site includes Mahurangi Island Recreation Reserve (2). - Offshore islands used for relocation of threatened wildlife (2). - Islands contain rare plant communities including Sand daphne and Dwarf mistletoe (3). - Common dolphins and New Zealand fur seals are sometimes seen in the marine reserve (3). - Regionally significant seascape (2). - Purangi is a site of significance to Hauraki iwi and local residents (2). - Te Whanganui-a-Hei is of local and regional importance and complements the seascape as viewed from Cathedral Cove Recreational Reserve. The reserve is of cultural and spiritual importance to Ngati Hei, and is a nationally important recreation site. - Extensive shellfish beds and shellfish gathering (2). - Geopreservation sites: Cathedral Cove (T11 593 821), Wigmore rhyolite dome (T11 615 804), Hahei rhyolite dome (T11 602 815) (4). - Significant site of early European settlement (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (local residents), cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			

<p>Endpoint criteria</p> <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area.
<p>Access</p> <ul style="list-style-type: none"> - Boat: via Whitianga Boat Ramp, and maybe Cooks Beach or Hahei depending on the sea state. - Vehicle: road access points via Hahei Rd and Purangi Rd.

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Yes
On water Recovery		✓	Maybe
Dispersant Application		✓ (High flow and offshore only)	Maybe - last resort and only on instruction from the NOSC



Purangi Estuary (3).



Te Whanganui-a-Hei Marine Reserve (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online]
<http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.

Figure 25 Whitianga Harbour / Purangi Estuary & Te Whanganui-a-Hei Marine Reserve

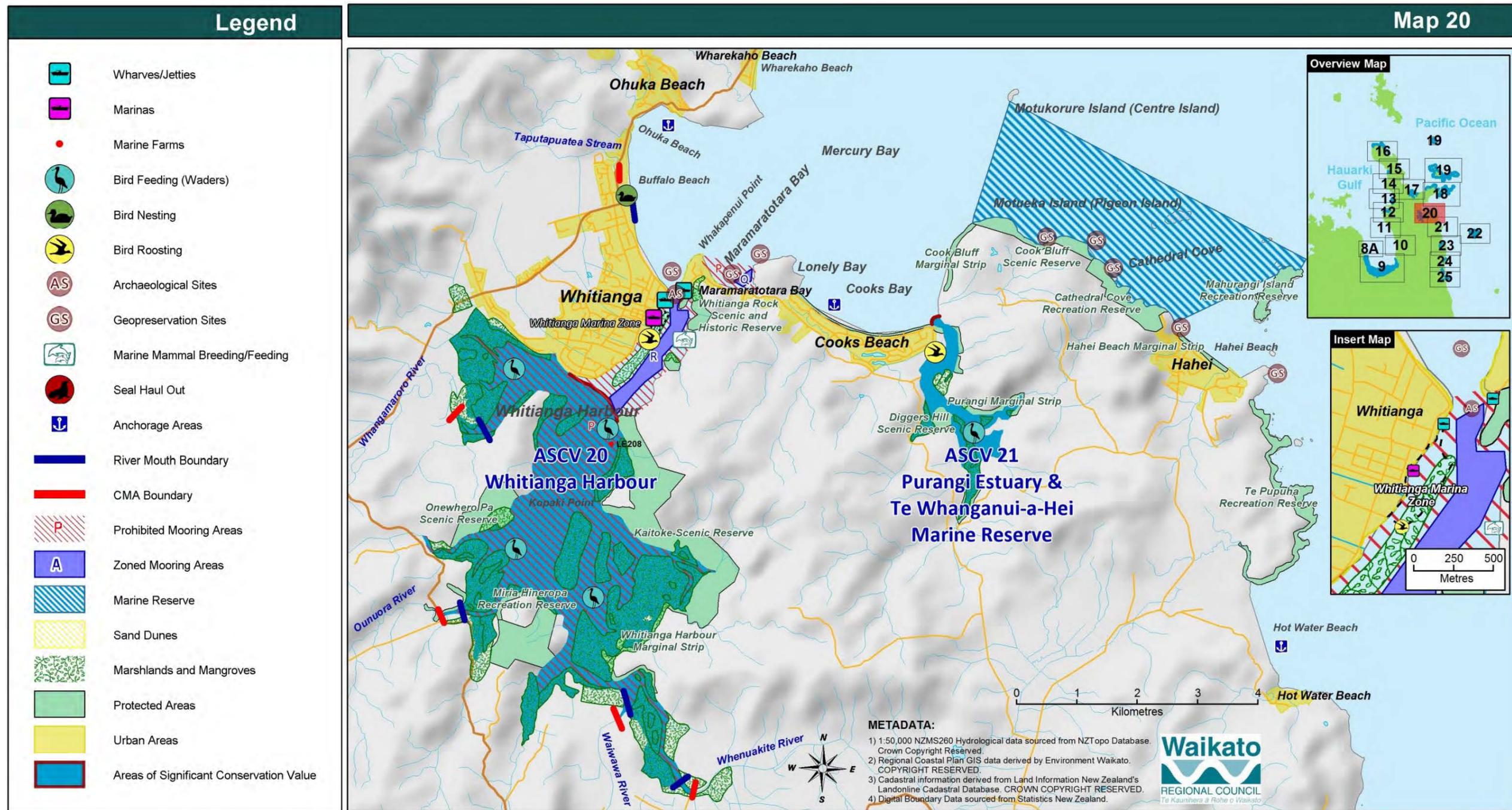
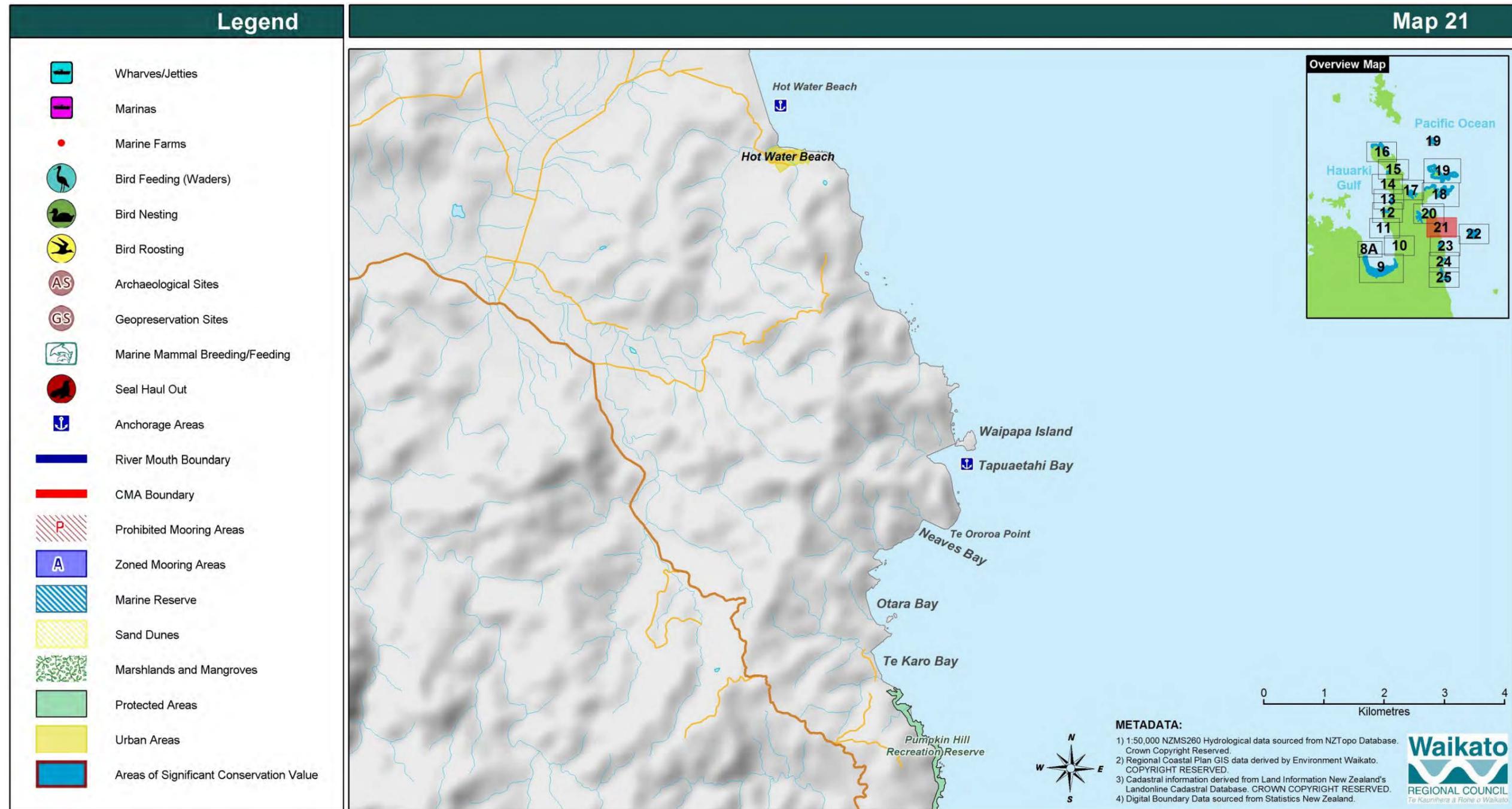


Figure 26 Hot Water Beach



Site 24	Alderman Island Group		Risk: moderate
Classification	Coromandel Peninsula/ Subtidal area/ Offshore Island		
Description			
<i>*Citations noted in brackets.</i>			
Offshore islands, consisting of five larger islands and numerous small rock stacks. All islands except for Middle Chain are little modified and support remnant coastal forest. These islands are refuges for threatened flora and fauna. Diverse and abundant invertebrate reptile fauna, seabirds and tuatara. High ecological area.			
Foreshore Type / Environmental Value	Rocky Reserve/ Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeology		
Map sheets	Topo50- BAB37	Topo250- 6	
At risk resources			
<ul style="list-style-type: none"> - Islands and rock stacks are gazetted nature reserves (2). - Frequented by NZ fur seal (2). - Significant burrowing seabird colonies (2), petrels and shearwaters (18). - Threatened lizard and tuatara (2). - Threatened plants including Cook's scurvey grass and Large-leaved milk tree (3). - Large and diverse populations of fish species (3). - Large groups of common dolphins, bottlenose dolphins, killer whales and several species of whale (3). - Site of significance to Hauraki iwi have been used for traditional harvest of titi and gardening (2) - Nationally significant seascape (2). Of national importance for fishing, diving and boat charters. - Geopreservation sites: Alderman Islands coastal landforms, Middle Island (U11 845 668), The Spire (863 672), Pisa Rock (851 647) (2) and Ruamahaiti andesite flow (U11 849 652) (4). - Regionally significant archaeological sites (2). 			
Notes			
<ul style="list-style-type: none"> - Communications via cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from washing onto these islands. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the shore may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
Boat: launching facilities at Tairua.			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Very unlikely
On water Recovery		✓	Very unlikely
Dispersant Application		✓ (High flow and offshore only)	Possibly
Shoreline Cleanup		✓	Maybe
Natural Recovery	✓		Very likely

References

2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Site 25	Tairua Harbour		Risk: moderate
Classification	Coromandel Peninsula/ Intertidal area/ Tidal lagoon		
Description			
<i>*Citations noted in brackets.</i>			
A small relatively unmodified estuarine ecosystem fringed by extensive inter-tidal mud/sand flats, seagrass beds, mangroves and pockets of coastal forests, which is utilised by a varied array of marine life and coastal wildlife.			
Foreshore Type / Environmental Value	Tidal lagoon, mud/sand flats, seagrass beds and mangrove forests. Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological		
Map sheets	Topo50- BB36	Topo250- 6	
At risk resources			
<ul style="list-style-type: none"> - Resident and frequenting, rare and threatened wading and coastal bird species of high diversity, including threatened New Zealand dotterel, banded rail and variable oyster catcher, banded dotterel, spotless crane, Caspian tern, white-fronted tern, North Island fernbird, reef heron, little black shag and black shag (3), (2), (15). - Pauanui spit is one of six main flocking sites for New Zealand dotterels in the Coromandel Peninsula (3). Royal Billy Point is an important New Zealand dotterel nesting site. - Threatened plants include Golden sand tussock and Pingao (3). - Saltmarsh, seagrass, mangrove communities and shellfish beds (15). - Killer whales are sometimes seen at the Tairua Harbour entrance (3). - Whitebait spawning habitat (2). - Two highly threatened populations of dune snails (12). - Site of significance to Hauraki iwi (2). - Shellfish gathering, boating and fishing (1). - Geopreservation sites: Paku Island perlite (T11 656 628), Pauanui coastal flats (T11 656 614) barrier spit and geomorphological features and shore platform (4). - Archaeological shell middens (2). 			
Notes			
<ul style="list-style-type: none"> - Communication via phone (harbourmaster and local residents), cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Shore bird dotterels may be found in sector WAIK-00460. Oiled Wildlife Response should be contacted as soon as possible to arrange proactive removal of these birds. Removal may require 48 hours to complete. - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along this coastline close to shore, unless the sea state is calm, as the area is exposed and subject to rough seas. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Marina has high recreation values and should be protected if possible. Any ongoing cleaning should be undertaken according to a location specific plan. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: Via Tairua and Pauanui boat ramps. - Vehicle: Via various road access points around harbour. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Possibly
On water Recovery	✓		Maybe
Dispersant Application		✓ (Outgoing tide)	No
Shoreline Cleanup		✓	Very likely
Natural Recovery	✓		Possibly

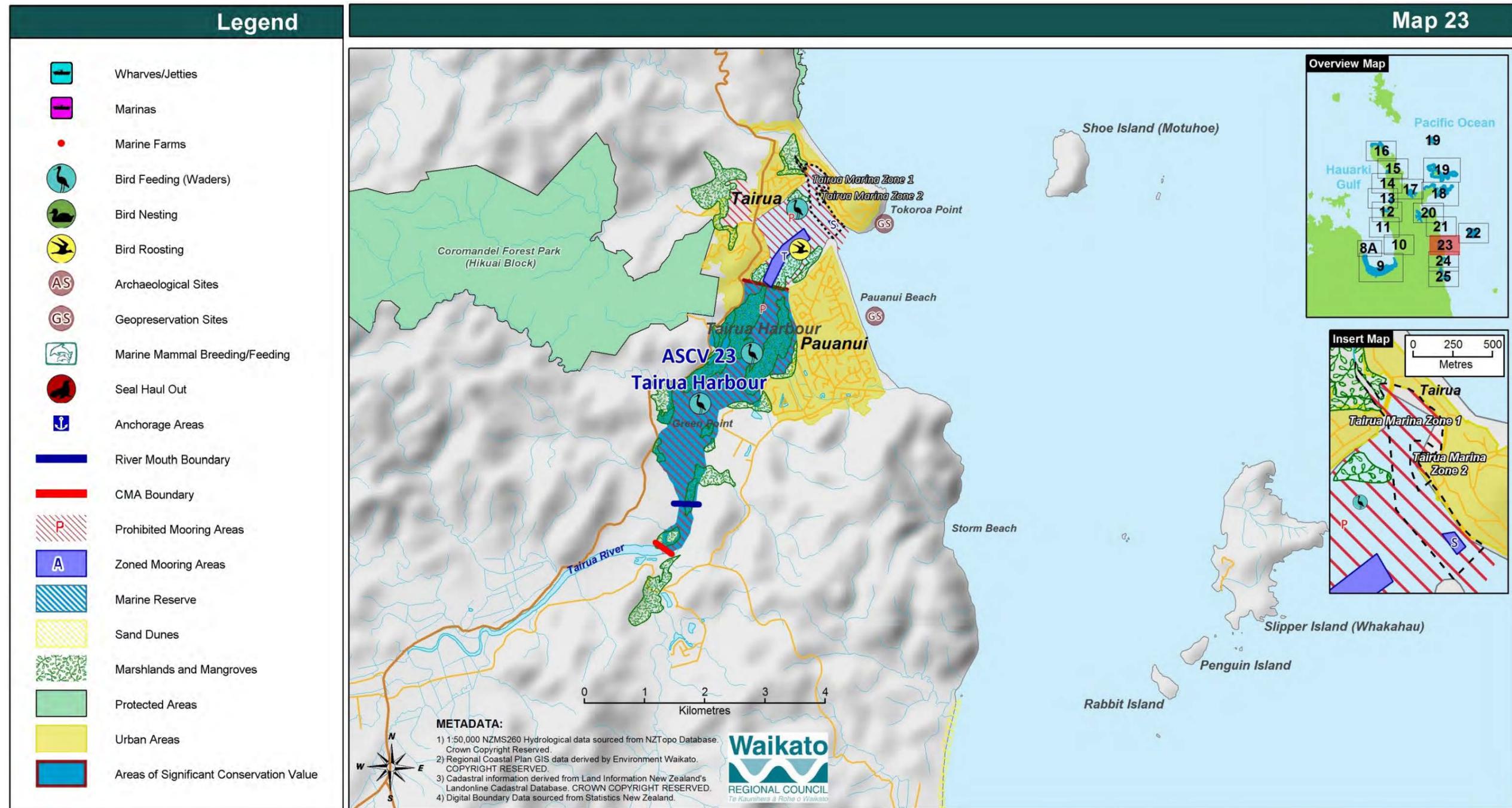


Tairua Harbour entrance (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
12. **Brook, F.J.** *Distribution and conservation status of the dune snail Succinea archevi Powell (Stylommatophora: Succineidae) in northern New Zealand.* Wellington : Department of Conservation, 1999.
15. Doc# 1393848.

Figure 28 Tairua Harbour



Site 26	Opoutere Sandspit and Wharekawa Harbour		Risk: High
Classification	Coromandel Peninsula/ Intertidal area/ Tidal lagoon		
Description			
<i>*Citations noted in brackets.</i>			
Relatively unmodified estuary which has formed behind an extensive sand spit and dune system, with mangrove and salt marsh communities and extensive seagrass and shellfish bed. The sand spit offers nesting for waders and shore birds.			
Foreshore Type / Environmental Value	Sand, mangrove and saltmarsh Habitat/ Cultural/ Food/ Amenity/ Archaeology		
Map sheets	Topo50- BB36	Topo250- 6	
At risk resources			
<ul style="list-style-type: none"> - An area of outstanding wildlife habitat value of national importance due to the presence of many threatened bird species. Wildlife Refuge, gazetted 1967 (2). - Resident and frequenting rare and threatened waders and coastal bird species, including variable oyster catcher, banded rail and bittern (2), eastern bar-tailed godwit, black shag, Caspian tern, and North Island fernbird (3). - Large breeding population of NZ dotterel (2). - Reef herons breed on the rock stack on the ocean side of the spit (3). - Threatened plants include Pingao, <i>Pomaderris rugosa</i> and Sand daphne (3). - Significant saltmarsh, seagrass and mangrove communities (2). - A particularly diverse and abundant macrofaunal community (3). - Dune snail population at the southern end of Opotere Beach (12). - Site of significance to Hauraki iwi (2). - Of regional importance for shellfish gathering, boating, fishing. - Archaeological sites present (1). 			
Notes			
<ul style="list-style-type: none"> - Communications via cell phone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering the estuary. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Pre-emptive capture NZ Dotterels (min 48 hrs notice if possible). Operations to be informed by Wildlife due to the presence of these endangered birds. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: access via Opoutere boat ramp. - Vehicle: via Opoutere Rd and settlement. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery	✓		Maybe
Dispersant Application		✓	No
Shoreline Cleanup		✓	Yes
Natural Recovery	✓		Unlikely

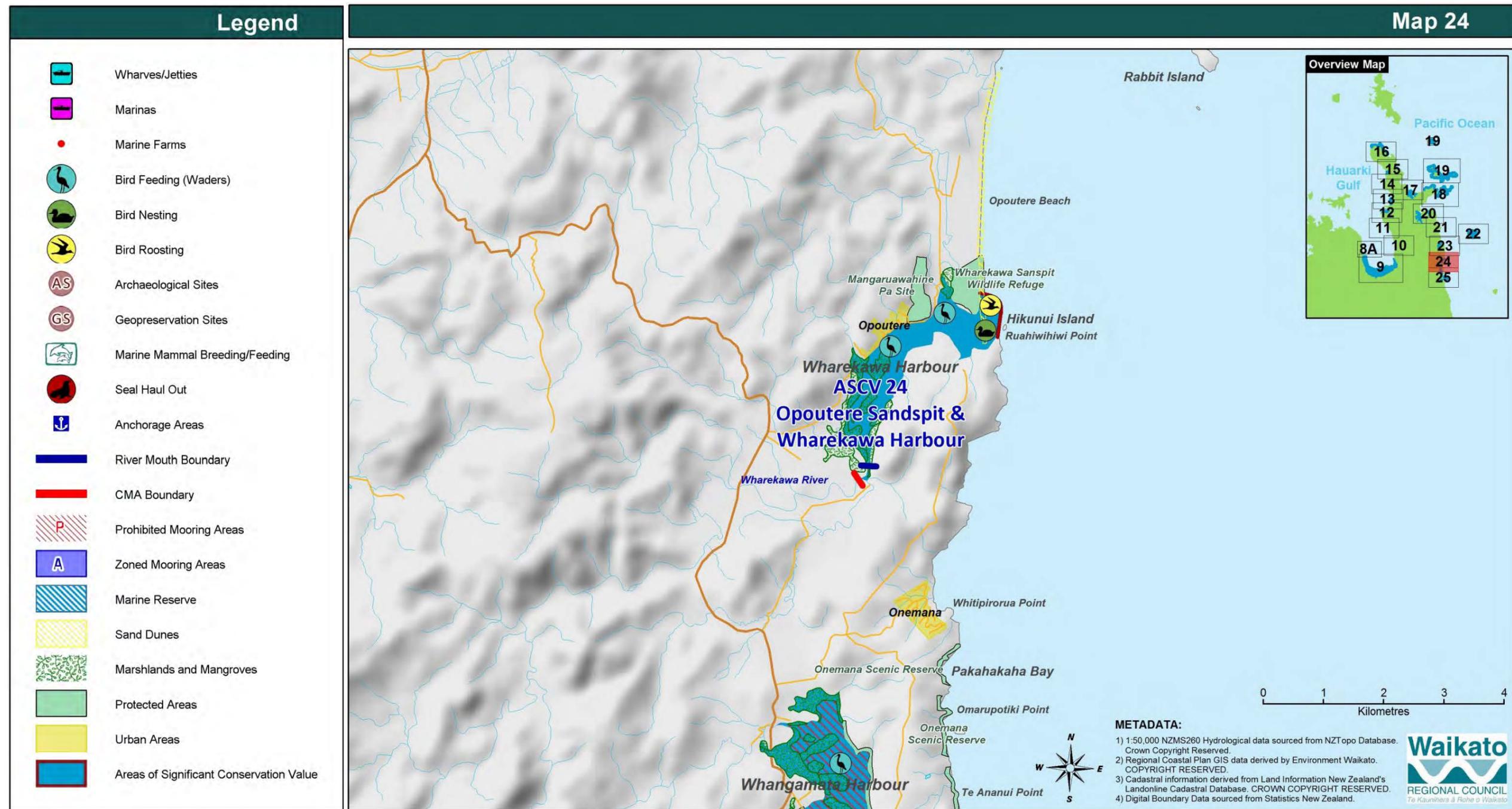


Wharekawa Harbour entrance (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
12. **Brook, F.J.** *Distribution and conservation status of the dune snail *Succinea archevi* Powell (*Stylommatophora: Succineidae*) in northern New Zealand.* Wellington : Department of Conservation, 1999.

Figure 29 Opoutere Sandspit & Wharekawa Harbour



Site 27	Whangamata Harbour/ Moanaanuanu Estuary		Risk: moderate
Classification	Coromandel Peninsula/ Intertidal area/ Tidal lagoon		
Description <i>*Citations noted in brackets.</i> Tidal harbour and large estuarine ecosystem, containing extensive mangroves, seagrass beds and tidal mud/sand flats. Boat marina and swing moorings. High energy water flows.			
Foreshore Type / Environmental Value	Tidal lagoon with mangroves and tidal flats. Habitat/ Cultural/ Food/ Amenity/ Archaeological/ Geopreservation		
Map sheets	Topo50- BB36	Topo250- 6	
At risk resources			
<ul style="list-style-type: none"> - Nationally important wildlife habitat of high value (2). The harbour mud/sand flats offer feeding for waders and shore birds; and habitat opportunities exist for wetland and coastal birds within the extensive mangrove communities. - Resident and frequenting rare and threatened waders and coastal bird species include reef heron, caspian tern, Australian Bittern, variable oystercatcher, New Zealand banded dotterel, Little black shag, Black shag, Banded Rail and Fern Bird recorded from the mangrove area (16). - Offshore Islands have a high level of lizard and invertebrate fauna (18). - Whangamata beach was and may still be an important New Zealand dotterel nesting site and is a nationally important nesting site for variable oystercatchers, and eastern bar-tailed godwit (3), (8). - Threatened plants include Sand daphne, Golden sand tussock and Coastal maire (3). - Moko skink population adjacent to Moanaanuanu Estuary (16). - Whitebait spawning (8). - Extensive saltmarsh, seagrass and mangrove throughout site (1). - Site of significance to Hauraki iwi (2). - Whangamata bar is a surf break of national significance (NZ Coastal Policy Statement 2010, Schedule 1). - Shell fish gathering (both on beach and in estuary), fishing, boating and swimming (1). - Archaeological sites present (1). - Geopreservation sites: Whangamata cusplate foreland (T12), Whangamata Fault Zone (T17), Whangamata Road tephra section A (T17) and Whangamata Road tephra section B (T17) (4). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC Area Office), cell phone and marine radio. - Main Whangamata beach has high recreational use. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering harbour at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms may be effective along the coastline close to shore, if the sea is calm. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: Access from boat ramp at main wharf. - Vehicle: via Whangamata township. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Low current areas
On water Recovery	✓		Maybe
Dispersant Application		✓ (Outgoing tide)	No
Shoreline Cleanup		✓	Possibly
Natural Recovery	✓		Not likely



Whangamata Harbour entrance (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
5. Doc# 1010789.
18. **Chappell, R.** Department of Conservation. *Personal communication.*

Site 28	Otahu Estuary		Risk: moderate
Classification	Coromandel Peninsula/ Intertidal area/ Tidal lagoon		
Description			
<i>*Citations noted in brackets.</i>			
Small, but virtually unmodified estuary, with intact sequences of coastal vegetation from seagrass through to coastal forest. Diverse vegetation communities are associated with the estuary and the adjoining margins. It offers intertidal mud/sand flats.			
Foreshore Type / Environmental Value	Tidal lagoon and flats.		
	Habitat/ Cultural/ Food/ Amenity/ Geopreservation/ Archaeological.		
Map sheets	Topo50- BB36	Topo250- 6	
At risk resources			
<ul style="list-style-type: none"> - This estuary is considered as one of the most significant estuarine environments for protection in the Coromandel Peninsula (16). It is considered to be one of a few areas left on the Coromandel Peninsula which can provide a reasonably intact natural sequence of habitats from the upper reaches of stream tributaries to marine habitats (1). - Unmodified saltmarsh, seagrass, mangrove and freshwater communities (2). - Representative wetland (2). - Native fisheries values (2). - Resident and frequenting rare and threatened, wading, coastal and freshwater bird species (2). The threatened caspian tern, variable oyster catcher, banded rail, North Island fern bird and Australasian bittern have been recorded in the estuary (3). - An important New Zealand Dotterel nesting site (8). - Site of significance to Hauraki iwi (2). - Recreational activities, fishing, swimming and boating (1). - Geopreservation sites – regionally important landforms, including Whangamata dune ridge system (1). - Archaeological sites present (1). 			
Notes			
<ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC area office), cellphone and marine radio. 			
Actions (preferred protection and clean up options)			
<ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Prefer to intercept oil prior to it entering the estuary at the narrowest point of entry using high current booming techniques as set out in report DM # 2220002 - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along the coastline close to shore, unless the sea is calm. - Prevention of the oil reaching the beach or estuary may best be achieved by the use of dispersants offshore. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria			
<ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access			
<ul style="list-style-type: none"> - Boat: Via main wharf at Whangamata. - Vehicle: Via southern end of Whangamata township. 			

Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery	✓		Yes
On water Recovery	✓		Likely
Dispersant Application		✓ (Outgoing tide)	No
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Very unlikely



Otahu Estuary (3).

References

1. Doc# 659340.
2. Doc# 1021525.
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
5. **Singleton, N.** *Regional Estuary Monitoring Programme.* Hamilton : Waikato Regional Council, 2009.
16. Doc# 1194680.

Site 29	Clark Island Group/ Whangamata Islands		Risk: Low
Classification	Coromandel Peninsula/ Subtidal area/ Offshore Island		
Description <i>*Citations noted in brackets.</i> Near shore islands, two large and several small islands and rock stacks, east of Whangamata. The larger islands support remnant coastal forest and populations of sea birds. Potential for management as refuges for threatened flora and fauna.			
Foreshore Type / Environmental Value	Rocky Islands Habitat/ Cultural/ Food/ Amenity		
Map sheets	Topo50- BB36	Topo250- 6	
At risk resources <ul style="list-style-type: none"> - Island wildlife sanctuaries (2). - Rare and threatened fauna (2). - Tuatara historically present but not recently confirmed. - Site of significance to Hauraki iwi (2). - Of regional significance for fishing, diving, sailing and charter boats. 			
Notes <ul style="list-style-type: none"> - Communications via phone (Harbourmaster or TCDC Area Office), cellphone and marine radio. Actions (preferred protection and clean up options) <ul style="list-style-type: none"> - Shellfish harvesting information should be sourced from local iwi, Medical officers of health and DoC. - Where possible, oil should be prevented from entering this sensitive area. Deflection booms are unlikely to be effective along this coastline close to shore, unless the sea state is calm, as the area is exposed and subject to rough seas. - Carry out shoreline and wildlife rehabilitation if required. 			
Endpoint criteria <ul style="list-style-type: none"> - Rehabilitation dependant on stakeholder expectations and surveys of unaffected immediate surrounding area. 			
Access Water: Via boat launching facilities at Whangamata.			

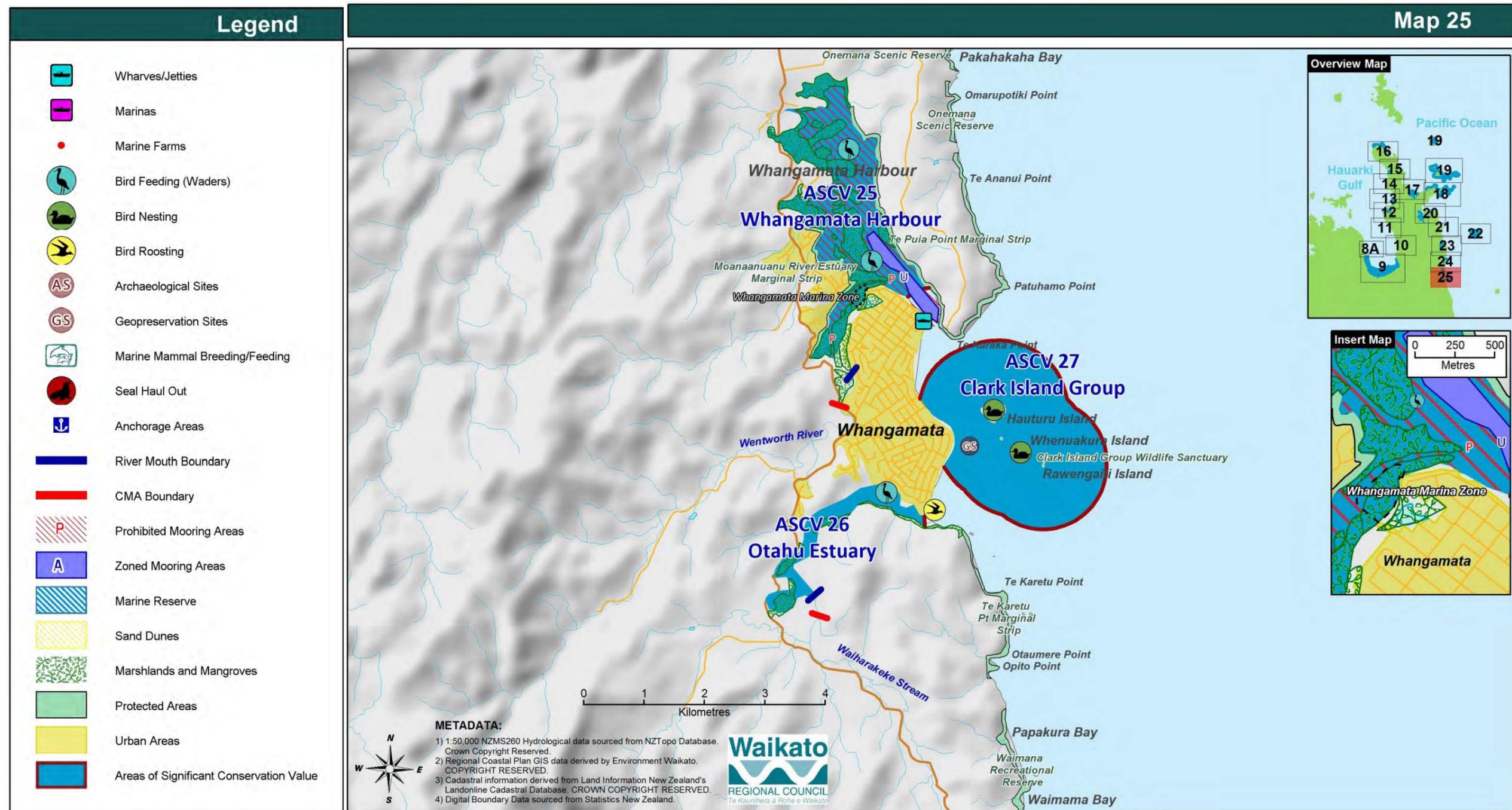
Preferred Response Option Matrix

	Most preferred	Least preferred	Feasibility (to be completed by Ops.)
Containment and Recovery		✓	Not very likely
On water Recovery		✓	Maybe
Dispersant Application		✓ (High flow and offshore only)	Very unlikely
Shoreline Cleanup		✓	Likely
Natural Recovery	✓		Likely

References

2. Doc# 1021525.

Figure 30 Upper Whangamata Harbour / Clark Island Group / Otahu Estuary



7 Environmental Risk Assessments

Broad shoreline: Waikato West Coast

Resources Present	Site /Environmental Compartment				
SITE NAME	Mokau River Estuary	Awakino River Estuary	Marokopa River Estuary	Taharoa Beach (NZ Steel mine site)	Albatross Pt adjoining coastline
MAIN SHORELINE TYPE	Mudflats and saltmarsh	Sand and estuary	Sand, mudflat and saltmarsh	Sand	Sand, Rocky
SURROUNDING USE	Ag, Res, Rec	Nat, Ag, Res, Rec	Nat, Ag, Res, Rec	Nat, Com	Nat, Ag
ECOLOGICAL					
Corals					
Mangroves					
Salt-marsh	250 (2A)		250 (2A)		
Seagrass					
Seaweed					
Shellfish					
Fish spawning	250 (2A)	250 (2A)	X		
Spawning - other					
Shore birds	125 (3A)	125 (3A)	125 (3A)	25 (4A)	125 (3A)
Birds on Water	125 (3A)	125 (3A)	125 (3A)		
Swimming/diving birds					
Seals/Sea lions			1 (4D)		125 (3A)
Whales/dolphins	?	?	?		
Other			125 (3C)		
SOCIAL/CULTURAL					
Food gathering	125 (3A)	125 (3A)	125 (3A)	25 (4A)	25 (4A)
Cultural significance	125 (3A)		125 (3A)	25 (4A)	125 (3A)
Archaeological site	25 (4A)	1 (4D)	25 (4A)		125 (3A)
Geopreservation site	25 (4A)		25 (4A)	25 (4A)	5 (4C)
High aesthetic value	5 (4C)	5 (4C)	5 (4C)		
Protected area	Yes				
Recreational value	25 (4A)	25 (4A)	5 (4C)	25 (4A)	
Other					
ECONOMIC					
Aquaculture					
Marina					
Fishery - Fish	125 (3A)	125 (3A)	125 (3A)		
Fishery- Other (eg. Lobster)					
Infrastructure					
Other					
Score	1205	781	1311	125	405

Broad shoreline: Waikato West Coast

Resources Present	Site /Environmental Compartment				
SITE NAME	Kawhia Harbour	Aotea Harbour	Gannet Island	Raglan Harbour	Waikato River mouth and estuary
MAIN SHORELINE TYPE	Saltmarsh, seagrass	Mud/ Sand, Saltmarsh, seagrass	Rock	Sand, mudflat and saltmarsh	Mud/ Sand, Saltmarsh, seagrass
SURROUNDING USE	Nat, Ag, Res, Rec	Nat, Ag & Res	Nat	Nat, Ag, Com, Res, Rec	Nat, Ag, Res, Rec
ECOLOGICAL					
Corals					
Mangroves				25 (4A)	
Salt-marsh	125 (3A)			250 (2A)	
Seagrass	250 (2A)	250 (2A)			250 (2A)
Seaweed	250(2A)	250 (2A)			250 (2A)
Shellfish				25 (4A)	
Fish spawning					
Spawning - other					250 (2A)
Shore birds	625 (1A)	125(3A)		250 (2A)	250 (2A)
Birds on Water	250 (2A)	125 (3A)		250 (2A)	250 (2A)
Swimming/diving birds	250 (2A)		250 (2A)	125 (2A)	125 (125)
Seals/Sea lions			125 (3A)		
Whales/dolphins	125 (3A)	10 (4B)		125 (4A)	125 (3A)
Other	125 (3A)	25 (4A)			25 (4A0)
SOCIAL/CULTURAL					
Food gathering	125 (3A)	125 (3A)		125 (3A)	125 (3A)
Cultural significance	625 (1A)	250 (2A)	125 (3A)	25 (4A)	250 (2A)
Archaeological site	5 (4C)			25 (4A)	125 (3A)
Geopreservation site	25 (4A)	125 (3A)		25 (4A)	125 (3A)
High aesthetic value	25 (4A)			25 (4A)	125 (3A)
Protected area		Yes			
Recreational value	25 (4A)	25 (4A)		125 (3A)	125 (3A)
Other					
ECONOMIC					
Aquaculture	125 (3A)				
Marina					
Fishery - Fish	125 (3A)			125 (3A)	250 (2A)
Fishery- Other (eg. Lobster)					
Infrastructure	25 (4A)				
Other					
Score	3105	1310	500	1500	2650

Broad shoreline: Firth of Thames

Resources Present	Site /Environmental Compartment			
SITE NAME	Firth of Thames	Mania and Te Kouma Harbour	Inner Coromandel Harbour	Colville Bay
MAIN SHORELINE TYPE	Mangrove & mudflats	Mangrove, seagrass & saltmarsh	Mangrove, seagrass & saltmarsh	Mangrove, seagrass & saltmarsh
SURROUNDING USE	Nat, Ag, Com, Res, Rec	Nat & Ag	Nat, Ag, Res & Rec	Nat, Ag, Res
ECOLOGICAL				
Corals				
Mangroves	625 (1A)	250 (2A)	250 (2A)	250 (2A)
Salt-marsh	250 (2A)	125 (2A)	250 (2A)	250 (2A)
Seagrass		125 (2A)	50 (3B)	50 (3B)
Seaweed				
Shellfish	125 (3A)		125 (3A)	
Fish spawning				
Spawning - other				
Shore birds	625 (1A)	250 (2A)	250 (2A)	125 (3A)
Birds on Water		125 (3A)	125 (3A)	250 (2A)
Swimming/diving birds		125 (3A)	125 (3A)	125 (3A)
Seals/Sea lions				
Whales/dolphins	125 (3A)		125 (3A)	
Other		250 (2A)	625 (1A)	
SOCIAL/CULTURAL				
Food gathering	125 (3A)	125 (3A)	25 (4A)	25 (4A)
Cultural significance	25 (4A)	125 (3A)	50 (3B)	25 (4A)
Archaeological site	25 (4A)			50 (3B)
Geopreservation site	625 (1A)			
High aesthetic value	250 (2A)		10 (4B)	
Protected area	Yes			
Recreational value	250 (2A)	125 (3A)	250 (2A)	125 (4A)
Other				
ECONOMIC				
Aquaculture	125 (3A)		125 (3A)	
Marina				
Fishery - Fish	125 (3A)			
Fishery- Other (eg. Lobster)				
Infrastructure				
Other				
Score	3300	1625	2135	1275

Broad shoreline: East Coast

Resources Present	Site /Environmental Compartment				
SITE NAME	Cape Coville to Sandy Bay	Waikawau Bay and Estuary	Whangapoua Harbour	Kuaotunu Peninsula	Ohinaiu Island Group
MAIN SHORELINE TYPE	Sandy & Rocky	Sandy, mangrove, saltmarsh & seagrass	Mangroves, saltmarsh & seagrass	Rocky, exposed	Rocky
SURROUNDING USE	Nat, Ag	Nat, Res	Nat, Ag, Com, Res, Rec	Nat, Ag, Res	Nat, Rec
ECOLOGICAL					
Corals					
Mangroves		250 (2A)	250 (2A)		
Salt-marsh		250 (2A)	250 (2A)		
Seagrass		250 (2A)	250 (2A)		
Seaweed					
Shellfish	5 (4C)		25 (4A)	10 (4B)	5 (4C)
Fish spawning					
Spawning - other					
Shore birds	125 (3A)	250 (2A)	625 (1A)	125 (3A)	50 (3B)
Birds on Water	125 (3A)	125 (3A)	250 (2A)		250(2A)
Swimming/diving birds	125 (3A)	125 (3A)	250 (2A)	25 (3C)	1 (4D)
Seals/Sea lions					
Whales/dolphins		250 (2A)		5 (4C)	
Other	250 (2A)			125 (3A)	250 (2A)
SOCIAL/CULTURAL					
Food gathering			125 (3A)	25 (4A)	125 (3A)
Cultural significance	25 (4A)	25 (4A)	25 (4A)	25 (4A)	125 (3A)
Archaeological site	1 (4D)	1 (4D)	1 (4D)	25 (4A)	1 (4D)
Geopreservation site	10 (4B)	625 (1A)	125 (3A)	25 (4A)	10 (4B)
High aesthetic value	250 (2A)	250 (2A)	25 (4A)	25 (4A)	250(2A)
Protected area				Yes	
Recreational value	125 (3A)	25 (4A)	50 (3B)	25 (4A)	10 (4B)
Other					
ECONOMIC					
Aquaculture					
Marina					
Fishery - Fish					
Fishery- Other (eg.					
Infrastructure					
Other					
Score	1041	2426	2251	440	1077

Broad shoreline: East Coast

Resources Present	Site /Environmental Compartment				
SITE NAME	Mercury Island Group and Curvier Island	Whitianga Harbour	Purangi Estuary and Te Whanganui-a-Hei Marine Reserve	Alderman Island Group	Tairua Harbour
MAIN SHORELINE TYPE	Rocky Islands & Sand	Mangrove & Saltmarsh	Rocky & sand, mangrove, mud/sand & seagrass		
SURROUNDING USE	Nat, Rec	Nat, Ag, Res, Rec	Nat, Res, Rec	Nat, Rec	Nat, Ag, Res, Rec
ECOLOGICAL					
Corals			625 (1A)		
Mangroves		250 (2A)	250 (2A)		250 (2A)
Salt-marsh		250 (2A)	250 (2A)		250 (2A)
Seagrass	?	50 (3B)	50 (3B)		50 (3b)
Seaweed	10 (4B)		10 (4B)		
Shellfish	25 (4A)	10 (4B)	25 (4A)	5 (4C)	25 (4A)
Fish spawning		50 (3B)	10 (4B)		100 (2B)
Spawning - other					
Shore birds	125 (3A)	125 (3A)	25 (4A)	125 (3A)	125 (3A)
Birds on Water	50 (3B)	25 (3C)	1 (4D)	50 (3B)	125 (3A)
Swimming/diving birds	625 (1A)	50 (3B)	5 (4C)	625 (1A)	125 (3A)
Seals/Sea lions	1 (4D)		125 (3A)	1 (4D)	
Whales/dolphins		25 (4A)		5 (4C)	1 (4D)
Other	125 (3A)			50 (3B)	50 (3B)
SOCIAL/CULTURAL					
Food gathering	25 (4A)	25 (4A0)	50 (3B)	125 (3A)	125 (3A)
Cultural significance	25 (4A)	25 (4A)	50 (3B)	125 (3A)	125 (3A)
Archaeological site	25 (4A)	10 (4B)	5 (4C)	1 (4D)	100 (2B)
Geopreservation site	25 (3C)	25 (3C)	25 (4A)	1 (4D)	50 (2C)
High aesthetic value	250 (2A)	25 (4A)	125 (3A)	5 (4C)	25 (4A)
Protected area	Yes		Yes	Yes	
Recreational value	25 (4A)	25 (4A)	25 (4A)	50 (3B)	25 (3C)
Other					
ECONOMIC					
Aquaculture					
Marina		25 (4A)			
Fishery - Fish		25 (4A)			
Fishery- Other (eg. Lobster)					
Infrastructure					
Other					
Score	1111	1045	1656	1164	1551

Broad shoreline: East Coast

Resources Present	Site /Environmental Compartment				
SITE NAME	Opoutere Sandspit and Wharekawa Harbour	Upper Whangamata Harbour	Otahu Estuary	Clark Island Group	Opoutere Sandspit and Wharekawa Harbour
MAIN SHORELINE TYPE	Sandspit & mangroves	Mangrove & mud/sand	Estuary, mud/sand	Rocky Islands	Sandspit & mangroves
SURROUNDING USE	Nat, Ag, Res	Nat, Res	Nat, Res	Nat, Rec	Nat, Ag, Res
ECOLOGICAL					
Corals					
Mangroves	250 (2A)	250 (2A)	250 (2A)		250 (2A)
Salt-marsh	250 (2A)	250 (2A)	250 (2A)		250 (2A)
Seagrass	50 (3B)	50 (3B)	50 (3B)		50 (3B)
Seaweed					
Shellfish				5 (4C)	
Fish spawning	100 (2B)	100 (2B)	100 (2B)	5 (4C)	100 (2B)
Spawning - other					
Shore birds	625 (1A)	125 (3A)	125 (3A)	1 (4D)	625 (1A)
Birds on Water	625 (1A0)	50 (3B)	50 (3B)	5 (4C)	625 (1A0)
Swimming/diving birds	125 (3A)	50 (3B)	50 (3B)	25 (3C)	125 (3A)
Seals/Sea lions				1 (4D)	
Whales/dolphins					
Other	50 (3B)	5 (3D)		5 (3D)	50 (3B)
SOCIAL/CULTURAL					
Food gathering	125 (3A)	125 (3A)	125 (3A)	25 (3C)	125 (3A)
Cultural significance	100 (3B)	125 (3A)	125 (3A)	50 (3B)	100 (3B)
Archaeological site	1 (4D)	1 (4D)	1 (4D)		1 (4D)
Geopreservation site		250 (2A)		50 (3B)	
High aesthetic value					
Protected area	Yes				Yes
Recreational value	25 (4A)	125 (3A)	25 (3C)	10 (4B)	25 (4A)
Other			625 (1A)		
ECONOMIC					
Aquaculture					
Marina					
Fishery - Fish					
Fishery- Other (eg. Lobster)					
Infrastructure					
Other					
Score	2326	1506	1776	182	2326

8 Marine farms

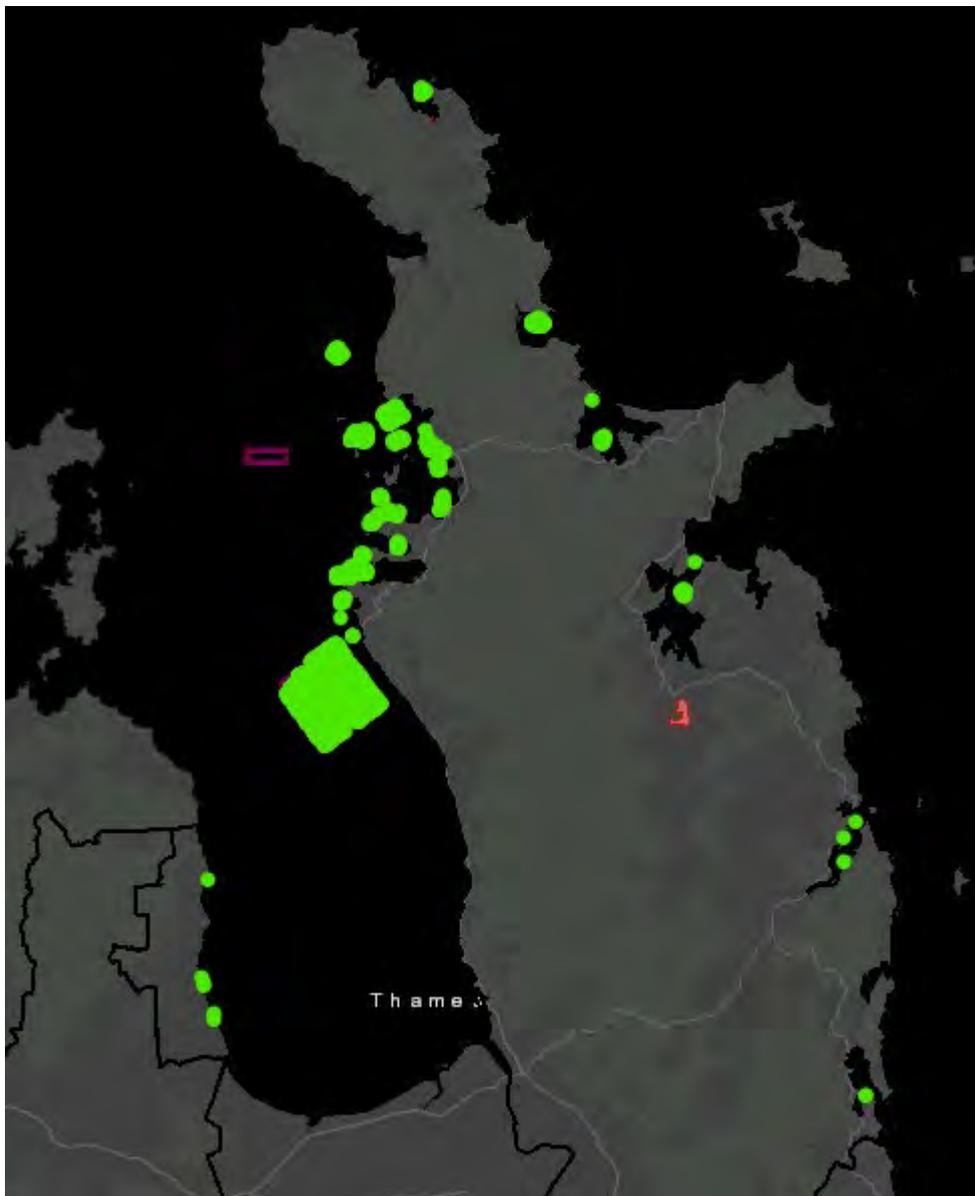
In the Coromandel most marine farmers belong to the Coromandel Marine Farmers Association contact is phone Tom Hollings on [REDACTED]

In the event of a spill it make contact with marine farmers to warn them of the possible threat. Maps of the coastline of the region have been inserted in the following pages, to provide a guide to the position of both marine farms and Department of Conservation areas.

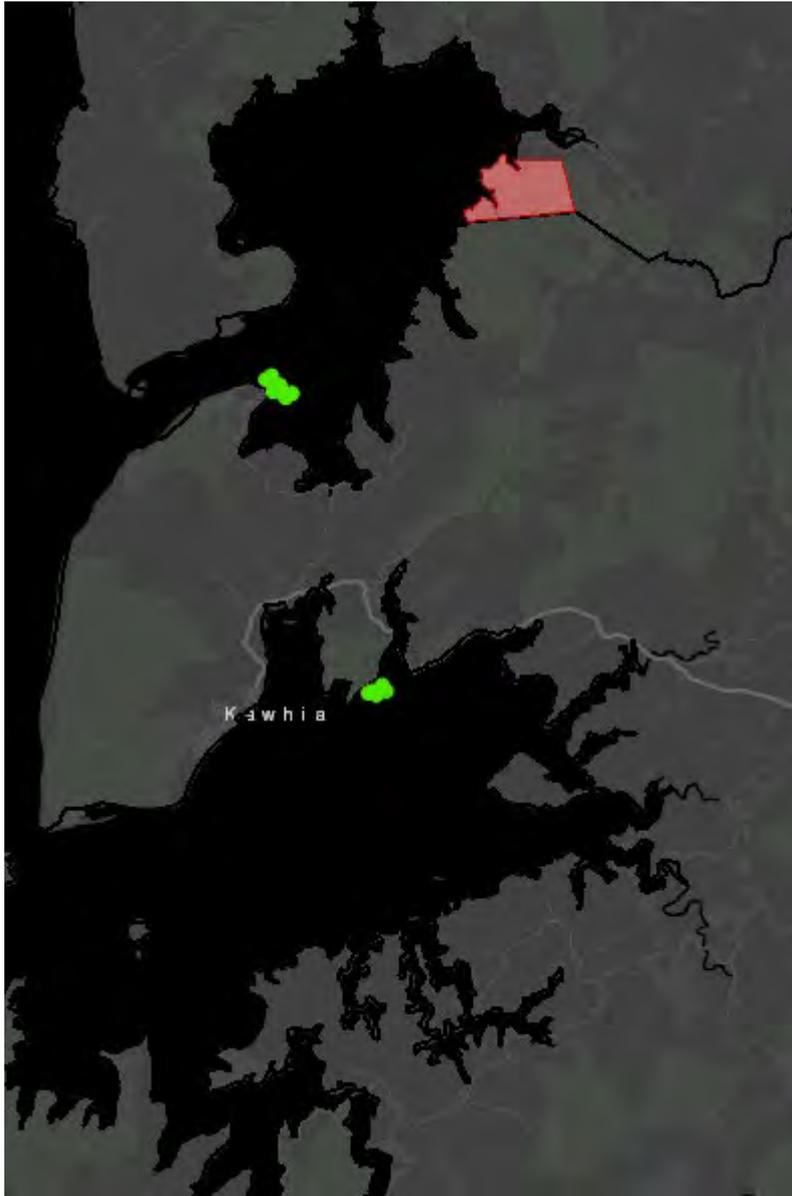
Figure 31 Marine farms map

<https://arcmapslive.wairc.govt.nz/LMViewer/?map=0cfcfae653984342b6574d6366f8f29aCoromandel>

8.1 Coromandel



8.2 Raglan and Kawhia



8.3 Places of refuge

In situations where an oil spill is likely to arise from damage sustained by a vessel, it may be necessary for the ship to use an appropriate safe haven. Because of the nature of the coastline, the Waikato region does not have a designated safe haven. In this case the regional on-scene commander may designate a safe haven, as and where appropriate.

9 Contact information

See Volume 1 doc # 2371737

10 Forms Used in Environmental Risk Assessment

Form 1 – Assessment Form

Resources Present	Site /Environmental Compartment				
SITE NAME					
MAIN SHORELINE TYPE					
SURROUNDING USE					
ECOLOGICAL					
Corals					
Mangroves					
Salt-marsh					
Seagrass					
Seaweed					
Shellfish					
Fish spawning					
Spawning - other					
Shore birds					
Birds on Water					
Swimming/diving birds					
Seals/Sea lions					
Whales/dolphins					
Other					
SOCIAL/CULTURAL					
Food gathering					
Cultural significance					
Archaeological site					
Geopreservation site					
High aesthetic value					
Protected area					
Recreational value					
Other					
ECONOMIC					
Aquaculture					
Marina					
Fishery - Fish					
Fishery- Other (eg. Lobster)					
Infrastructure					
Other					

Form 2 – Impact Assessment Matrix

			RECOVERY TIME			
			SLOW ←	→		RAPID
			>10 yrs	5 – 10 yrs	2 – 5 yrs	< 1 yr
			1 (25 pts)	2 (10 pts)	3 (5 pts)	4 (1 pt)
Potential Impact	Severe (>50%) (25 pts)	A	1A (625 pts)	2A (250 pts)	3A (125 pts)	4A (25 pts)
	Major (30-50%) (10 pts)	B	1B (250 pts)	2B (100 pts)	3B (50 pts)	4B (10 pts)
	Minor (10-30%) (5 pts)	C	1C (125 pts)	2C (50 pts)	3C (25 pts)	4C (5 pts)
	Slight (<10%) (1 pt)	D	1D (25 pts)	2D (10 pts)	3D (5 pts)	4D (1 pt)

	HIGH CONCERN		MODERATE CONCERN		LOW CONCERN
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11 References and useful documents

1. *Waikato Regional Council Doc# 659340.*
2. *Waikato Regional Council Doc# 1021525.*
3. **Bouma, S.** *Biological data for identified areas of significant conservation value in the Waikato coastal and marine environment.* Waikato : Department of Conservation, 2007.
4. Waikato Region. *New Zealand Geopreservation Inventory.* [Online] <http://homepages.ihug.co.nz/~bw.hayward/NZGI/>.
5. *Waikato Regional Council Doc# 1010789.*
6. *Waikato Regional Council Doc#1010795.*
7. Protected coastal areas. *Waikato Regional Council.* [Online] <http://www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Coasts/Natural-character-and-biodiversity/co9-report/>.
8. **Singleton, N.** *Regional Estuary Monitoring Programme.* Hamilton : Waikato Regional Council, 2009.
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