



3.21 KENEPURU ESTUARY (Intertidal)

Kenepuru Estuary is located at the eastern end of Kenepuru Sound, 22 km from the main Pelorus Sound channel.

Assessment of ecological significance

The tidal area is used by a variety of wetland birds, occasionally including the banded rail¹²⁵. This estuarine area has not been formally surveyed but estuarine habitats are not common in Marlborough and may be important as stepping stones for migrating birds.

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QUEEN CHARLOTTE SOUND

MAP 14 - SITES WITHIN BIOGEOGRAPHIC ZONE 4 (1 of 2)



OVERVIEW

This coastal area covers Queen Charlotte Sound, eastern Marlborough Sounds, inside a line bisecting Long Island drawn from Te Ahitaore, Ship Cove to Cooper Point, Arapawa Island; and a second line drawn from Dieffenbach Point to Kaitapeha Bay, Arapawa Island. Queen Charlotte Sound's shoreline includes two large inlets (Endeavour Inlet and East Bay, Arapawa Island), approximately 20 large bays and numerous smaller coves. Maximum depths through most of the area range from approximately 30-45m. Depth reaches 75m off Dieffenbach Point at the entrance to Tory Channel, and there is a large depression 50-80m deep along the western side of Blumine Island. There are also holes up to 58m deep either side of Patten Passage. Unlike Tory Channel, maximum depths in the marginal bays and inlets are similar to those in the main body of the Sound.

The surrounding land is steep and most of the shoreline is fringed by cobbles and boulders. There are bedrock outcrops off points and on some pinnacles and shoals. Rocky shores extend to a maximum depth of 33m and average 12.4m maximum depth. Coarse, silty, shelly sand usually covers the lower



MAP 15 - SITES WITHIN BIOGEOGRAPHIC ZONE 4 (2 of 2)



slopes of the Sound and marginal bays below the rocky shores. Most of the floor of the Sound is covered by soft mud. The sandy margin meets the mud floor at an average depth of approximately 18.4m but may be as deep as 39m at steep sites. Sand and pebble beaches occur at the head of many bays and there are extensive sand flats at the head of the Sound in Okiwa Bay.

There is a commercial port in Picton Harbour and a large marina nearby in Waikawa Bay. The Sound is also visited by pleasure boats and commercial vessels from other regions, particularly Wellington. There is a treated sewage outfall off Kaipupu Point in Picton Harbour. Aquaculture is confined to a salmon farm in Ruakaka Bay and salmon and mussel farms in East Bay, Arapawa Island.

No major rivers discharge into Queen Charlotte Sound so freshwater inflow is generally low and the salinity gradient from its head to the mouth is only 0.24 parts per thousand. Maximum flood inflows are 1100 cubic metres per second. Heavy rain is not uncommon and can flush large amounts of fine sediments down the steep catchments into the Sound. Suspended sediment close to shore can rise from approximately 15 milligrams per litre to approximately 1000 milligrams per litre. This sediment settles rapidly, within a few tens of metres of shore. Water circulation in the Sound is poorly known. The tidal range is small – the mean spring tidal range at Picton is 1.5m. Tidal currents are strongest in the middle of the Sound around the entrance to Tory Channel where they reach 1-3 knots. There are also strong currents in Patten and Pickersgill Passages, elsewhere they range from 0.2-1 knots. The mean residence time of water in the main channel is approximately 31 days.

BIOTA

Queen Charlotte Sound has limited amounts of macroalgae. Large brown laminarian kelps are rare or absent with giant kelp and paddle weed restricted to a few bays and headlands either side of the entrance to Tory Channel. Fucoids are the dominant large brown algae. Narrow flapjack forms a sparse, patchy fringe at low water on some headlands and marginal bays but it is absent from most

of the inner Sound. Subtidal stands of flexible flapjack are relatively common but patchily distributed. Forests of flexible flapjack are found in Grove Arm, Onahau Bay, Lochmara Bay and along the southern shore of Allport's Island. Most subtidal reefs are dominated by crustose coralline algae and high densities of small kina.

Other common subtidal reef invertebrates include slaty sponge, small hydroids, the small colonial cup coral, common anemone, serpulid tubeworms (particularly *Galeolaria hystrix* and spirorbids), hermit crabs (*Pagurus novizelandiae*, *Pagurus traversi*), starry limpet, green topshell, Cook's turban, turret shell, catseye, arc shell, nesting mussel, fan shell, window oyster, false oyster, jewel star, cushion star, 11-arm star, snake star, sea cucumber, and saddle seasquirt. Reefs feature large colonies of tubeworms up to 60 cm high, mainly *Galeolaria hystrix* with some *Pomatoceros terranovae*. The tubeworm *Galeolaria hystrix* covers nearly all of the substrate at 7-30m depth on Perano Shoal. Rock lobster are uncommon and patchily distributed throughout the inner Sound but occur as far in as the head of Lochmara Bay. The habitat is suitable for rock lobster but anecdotal evidence suggests they have been largely fished out.

Common reef fish include eagle ray, conger eel, rock cod, sea perch, sweep, butterfly perch, yellow-eyed mullet, tarakihi, spotty, scarlet wrasse, blue cod, triplefins (common triplefin, yellow-black triplefin, mottled triplefin, variable triplefin, blue-eyed triplefin, oblique swimming triplefin, spectacled triplefin) and leatherjacket. Porcupine fish are sometimes seen on reefs in the inner parts of the Sound. Smooth pipefish can be common in stands of large brown algae. With the exception of spotty, common and variable triplefin and small blue cod, reef fish abundance is generally low throughout the Sound. Large schools of tarakihi may be found off prominent headlands and deeper reefs. The Sound is popular for recreational fishing and this pressure changes the size structure of the fish population. The abundance of large blue cod inside Long Island-Kokomohua Marine Reserve indicate that the lack of large cod elsewhere is due to the fishing pressure.

Soft sediments support varied assemblages depending on the depth, composition and hydrology. Scallop dredging has altered species assemblages in Blackwood and Ruakaka Bays, in the main channel between Curious Cove and Kurakura Point, and between Long and Motuara Islands. Accelerated sedimentation from catchment clearance and development may have altered seafloor life in sheltered bays. Species assemblages and nutrient cycling are modified beneath marine farms²⁰⁵. The sand flats at the head of Okiwa Bay support a typical estuarine community dominated by cockles and the wedge shell. Cockles and pipi are found in sands and gravels in bays with freshwater input. Fine clean sands at the head of some bays support small populations of tuatua, frilled venus shell and scimitar *Mactra*. Coarse sands below rocky reefs support beds of the bivalves purple sunset shell, *Venerupis largillierti* and large dog cockle. As the silt content of the sand increases the bivalves *Dosina zelandica* and strawberry cockle become more abundant. Common seafloor species include speckled whelk, knobbed whelk, horse mussels, scallops, filter-feeding hermit crab, cushion star, eleven-arm star, snake star, sea cucumber and saddle seasquirt. Muddy habitats are dominated by heart urchin, brittlestars *Amphiura correcta* and *Ophiocoma novaezelandiae*, holothurian *Pentadactyla longidentis*, bivalves *Ennucula strangei* and strawberry cockle, small tubeworms *Phyllochaetopterus socialis*, *Priapulius australis* and cirrolanid isopods (sea lice). On steep slopes, shell and tubeworm debris builds up and is colonised by fan shells, a variety of crustaceans and the brachiopod *Terebratella haurakiensis*.

Pebbles, coarse silty sand and shell cover the sea floor in a zone between Iwirua Point and Wedge Point, down to approximately 18m. Growing on these stable sediments are sponge-coralline turf (*Corallina officinalis*) aggregates, meadows of finely branched red algae (*Giffithsia* sp, *Plocamium cartlagineum*, *Callothamnion consanguineum*, *Gracilaria* n.sp.), large terebillid worms and several species of solitary sea squirt. There are dense beds of bivalves (purple sunset shell, *Venerupis largillierti*) in this area and animal life includes extremely large warty nudibranch that are up to 30cm long when crawling. Horse mussels can be common in muddy sands and mud, from low water to more than 30m depth, forming extensive beds below 15m deep in many places. There are large beds of the red algae *Adamsiella chauvinii*²⁹⁹ on mud between Ngakuta and Governor's Bay, on the western slope of Iwirua Point and in outer Onahau Bay (Dartmoor Bay). A dense bed of the large brachiopod *Neothyris lenticularis* grows among horse mussels at 18-30m from Iwirua Point to Wedge Point.



Neothyris lenticularis also occurs off Pihaka Point at the entrance to Blackwood Bay, in Endeavour Inlet, and East Bay, Arapawa Island but these beds are not as extensive as those in Grove Arm. The burrowing anemone is also found in East Bay but has not been recorded from Grove Arm.

Fish found in Queen Charlotte Sound include short-tailed stingray, eagle ray, spotted spiny dogfish, rough skate, elephant fish, red cod, southern pigfish, red gurnard, snapper, tarakihi, spotted stargazer, opal fish, crested flounder, witch, lemon sole, common sole and sand flounder. Rough skate spawn in Grove Arm between Ngakuta and Governor's Bays. Elephant fish spawn between Ngakuta and Blackwood Bays, with most spawning appearing to be in Kaipakirikiri Bay and the western arm of Kumutoto Bay at 4-12m depth.



Southern pigfish
(MDC)

There have been toxic phytoplankton blooms in the Sound from time to time, including a prolonged bloom of *Dinophysis acuta* that closed shellfish beds in the inner Sound for approximately three years from November 1994. Seasonal blooms of common jellyfish occur in the spring and early summer, and as in outer Pelorus Sound these have the potential to deplete zooplankton populations. The Sound supports a large population of pilchard. Other bait fish species are sprat, anchovy and jack mackerel. These small bait fish, particularly pilchard, and large zooplankton are fed upon by kahawai, barracouta, fluttering shearwater, blue penguin, gannet, white-fronted tern, common dolphin, dusky dolphin, bottlenose dolphin and Hector's dolphin. Other large predators in the Sound include juvenile thresher shark, bronze whaler, blue shark, kingfish and trevally.

Small groups of Hector's dolphin are often sighted around the southern half of Blumine Island (from Kurakura Point to Patten Passage) during summer. Killer whale or orca periodically enter the Sound. New Zealand fur seals are common particularly near salmon farms. Fur seals typically feed on pelagic species such as squid, jack mackerel and barracouta but have been seen eating conger eels and common octopus in Queen Charlotte Sound.

Japanese kelp was first seen in Picton Harbour in 1991 and has become well established. It is now widespread between Shakespeare Bay and the entrance to Tory Channel and is gradually spreading throughout Queen Charlotte Sound east of Dieffenbach Point. It appeared at Long Island Kokomohua Marine Reserve in 2010. In 2001 a colonial seasquirt *Didemnum vexillum* was found growing on the bottom of a barge moored in Shakespeare Bay. An attempt to eradicate it failed. This invasive species is also found in East Bay, Tory Channel and Pelorus Sound. Other exotic marine species recorded in the Queen Charlotte Sound include: *Cutleria multifida*, *Polysiphonia senticulosa*, *Elphidium vellai*, Yellow boring sponge, *Polydora armata*, *Polydora hoplura*, red rock crab, *Bugula flabellata*, *Bugula neritina*, *Cryptosula pallasiana*, Waxy sea squirt, *Botryllus schlosseri*, *Corella eumyota* and *Didemnum "candidum"*.

Table 5 - List of Sites of Significance in Biogeographic Zone 4

No.	Biogeographic Zone 4	Level of information	Representativeness	Rarity	Diversity & pattern	Distinctiveness	Size	Connectivity	Catchment
4.1	Okiwa Bay intertidal	1	H	M	H	M	M	L	L
4.2	Okiwa Bay	2	M	L	L	M	L	L	L
4.3	Bottle and Umungata Bays	1	L	L	L	L	M	H	H
4.4	Houhou Point	2	H	L	L	M	L	L	L
4.5	Ngakuta Bay	1	L	L	M	L	L	L	M
4.6	Ngakuta Point	2	L	L	M	L	L	L	M
4.7	Iwirua Point	4	L	L	M	L	L	M	M
4.8	Wedge Point	2	M	M	M	L	M	M	M
4.9	Wedge Point mounds	1	M	L	H	M	L	M	M
4.10	Shakespeare Bay Intertidal	1	M	M	M	M	L	L	L
4.11	Bob's Bay	1	H	M	M	H	L	L	H
4.12	Whatamango Bay intertidal	1	M	M	M	M	L	L	L
4.13	Lochmara Bay	2	L	L	M	L	L	L	M
4.14	Pihaka Point	1	M	M	M	M	L	M	M
4.15	Kumototo Bay	1	M	M	L	M	M	M	H
4.16	Perano Shoal	2	H	L	M	H	L	L	L
4.17	Queen Charlotte - Hector's dolphin area	2	M	H	L	L	M	NA	NA
4.18	Patten Passage	1	M	L	M	M	L	L	L
4.19	Ships Cove to Cannibal Cove	1	L	L	L	L	M	L	H
4.20	Papakura Point	4	H	M	L	H	L	L	L
4.21	Te Aroha Bay	3	L	L	M	L	M	L	L
4.22	Puriri Bay	3	M	L	M	M	H	L	L
4.23	Matiere Point	2	M	L	M	M	L	L	L
4.24	Onauku Bay	1	M	L	L	M	L	L	L
4.25	Onauku Bay northern coastline	2	H	M	M	H	H	L	L
4.26	Blumine Island	4	M	H	L	H	L	L	H
4.27	Endeavour Inlet intertidal	1	M	L	L	L	L	L	H

Key

1 = Brief visit

3 = Quantitative report

H = High

M = Medium

L = Low

2 = Qualitative report

4 = Personal communication



4.1 OKIWA BAY (Intertidal)



Okiwa Bay
(MDC)

The Okiwa intertidal flat covers approximately 74 ha at the head of Queen Charlotte Sound between The Grove and Thompson Bay.

Assessment of ecological significance

This is one of the larger tidal wetlands in the Marlborough Sounds and the largest in Queen Charlotte Sound. It is an important habitat for wildlife, especially waterfowl, black swan, ducks, waders and herons. White heron, Caspian tern and reef heron frequently use the area. There is a small permanent population of banded rail and large cockle beds. The lower tidal flats have extensive beds of sea grass, while the upper tidal flats are dominated by herb field species. The surrounding land is developed for housing, farming and roading. There is a small area of native coastal forest at The Grove.

4.2 OKIWA BAY (Subtidal)

Okiwa Bay covers an area of approximately 1.4 ha.

Assessment of ecological significance

Preliminary observations using a drop camera suggest that shallow subtidal areas have high densities of a solitary ascidian (sea squirt). Based on preliminary and visual observations no other area in the Marlborough Sounds has a community like this.

4.3 BOTTLE AND UMUNGATA BAYS (Subtidal and Intertidal)

This 2.6 km stretch of coastline is located along the northern coastline of inner Queen Charlotte Sound between Bottle and Umungata Bays, approximately 1.5 km from the head of the Sound. The catchments of these small bays are clad in mature coastal beech forest.

Assessment of ecological significance

This stretch of coast is notable for catchments clad in native forest, protected in the Iwituroa Scenic Reserve. Small streams enter the tidal flats, which feature salt marsh, sea grass beds and herb field communities. Subtidal areas support patchy horse mussel and sparse red algae beds. Elephant fish lay their eggs along this coastline. Relatively few bays in Marlborough are surrounded by protected mature native forest and this is one of the better examples.



4.4 HOUHOU POINT (Subtidal)

Houhou Point lies on the northern coast of Grove Arm, in the inner Queen Charlotte Sound, opposite Whenuanui Bay, and is approximately 6.7 km by sea from Picton.

Assessment of ecological significance

This site is notable for its population of giant lampshell and some of the highest density red algae beds known in the Queen Charlotte Sound. The red algae at this location are found in 6-15m depth around a bedrock outcrop, with up to 100% coverage in many places. The bed is dominated by *Adamsiella chauvinii*. Rough skate egg cases and scallops have been also been observed.

4.5 NGAKUTA BAY (Intertidal)

There is a small intertidal wetland of approximately 18 ha at Ngakuta Bay on the southern side of the Grove Arm. The wetland area is approximately 5 ha of mud and shingle flats and a small area of salt marsh dominated by sea rush. The area borders on to grassland and houses.

Assessment of ecological significance

Caspian tern and reef heron frequently feed and roost at this site. A wide range of other birds use the area and it is an important non-breeding gathering area for ducks, South Island pied oystercatcher and black-backed gulls¹⁰¹.

4.6 NGAKUTU POINT (Subtidal)

Ngakutu Point is north of Ngakuta Bay, on the southern shoreline of inner Queen Charlotte Sound approximately 7.3 km by sea from Picton.

Assessment of ecological significance

This area has a 2 ha bed of red algae (*Adamsiella chauvinii*). The bay east of the Point is characterised by a shallow sandy/shelly seafloor. Elephant fish are known to lay their eggs here. Both red algae and elephant fish spawning areas are restricted to discrete locations in Marlborough. Red algae beds are an important habitat for a variety of species and Elephant fish spawning areas are of international scientific interest^{101,115,118}.

4.7 IWIRUA POINT (Subtidal)

Iwirua Point is located immediately west of Wedge Point along the southern shoreline of Queen Charlotte Sound. A low relief reef supporting large tubeworm mounds extends offshore.

Assessment of ecological significance

A dense bed of the Red alga *Adamsiella chauvinii* occurs on the sides of the shoal extending off Iwirua Point, and large tubeworm mounds occur along the top. At certain times of the year these attract large schools of tarakihi and kingfish. A dense bed of horse mussels and giant lamp shells extends from Iwirua Point to Wedge Point between 18m to 30m depth.

4.8 WEDGE POINT (Subtidal Soft Shores)

Wedge Point is the western headland to Shakespeare Bay and is 3.2 km by sea from Picton.

Assessment of ecological significance

This is an elephant fish spawning area and giant lampshell habitat^{101,118}. Patches of red algal beds are found west of Wedge Point in 14-20m depth. Elephant fish spawning areas are of international scientific interest and giant lampshells are restricted to relatively few shallow locations in Marlborough¹¹⁵.

4.9 WEDGE POINT (Subtidal Rocky Shores)

A relatively shallow rocky reef extends offshore from Wedge Point. It is swept by moderate tidal currents and the bedrock supports many large tubeworm (*Galeolaria hystrix*) mounds. The substratum around the reef is dominated by shell, pebbles and fine sand.



Assessment of ecological significance

The densely packed tubeworm mounds support a variety of invertebrates and fish such as blue cod. The algae *Hydroclathrus clathratus* was recorded at this site during this study (previously it was known only from Northland and the Kermadec Islands)^{1,90}.

4.10 SHAKESPEARE BAY (Intertidal)

Shakespeare Bay is located immediately west of Picton Harbour. It has approximately 4 km of coastline and a tidal area of 78.5 ha. Tidal flats and salt marsh covers 8.4 ha at the head of the bay.

Assessment of ecological significance

This relatively small tidal area is visited by banded rail. Large areas of the lower tidal flats support beds of sea grass. The algae *Gracilaria* sp. is also common on the tidal flats. All estuarine areas in Marlborough are considered important as they are relatively uncommon.



Bispira bispira A.
Bob's Bay
(Don Morrissey)

4.11 BOB'S BAY (Subtidal)

Bob's Bay is a small bay along the eastern shoreline of Picton Harbour approximately 1.4 km north-west from the marina. The bay is 300m wide and 130m long. The seafloor is predominantly silty sand up to 15m depth, grading into soft mud below this. From 3-6m depth the surface of the sediment is completely covered by the tubes of a small sabellid polychaete with distinctive white feeding tentacles. At present the species is being treated as an undescribed native *Bispira bispira* A. This species has only been recorded from Blow Hole Point, Pelorus Sound, the northern shore of Waikawa Bay and Houhora Harbour in Northland (Geoff Read, NIWA, pers. comm.).

Assessment of ecological significance

This is one of only two locations in Marlborough and the only known area with such a high densities of this small sabellid worm⁹⁰.

4.12 WHATAMANGO BAY (Intertidal)

Whatamango Bay is located approximately 6.5 km north-east of Picton. The intertidal area of 10 ha has fringes of native scrub and is a combination of sand and mudflat, sea grass beds, salt marsh and shellfish beds.

Assessment of ecological significance

Reef heron regularly visit the area. High tide roosts are used by Caspian tern, gulls, shags and waterfowl¹⁰¹. All estuarine areas in Marlborough are considered important as they are relatively uncommon.

4.13 LOCHMARA BAY (Subtidal)

The western headland to Lochmara Bay (Hautehoro Point) is located on the northern shoreline of Queen Charlotte Sound. This inshore area supports patchy red algae beds (*Adamsiella chauvinii*) in depths of 16-23m. Horse mussels and parchment tubeworms are common and are usually associated with the algae beds.

Assessment of ecological significance

These species are sufficiently abundant at this site to form a biogenic habitat and may therefore be important for other species as habitat or as a food source^{197,381}. Elephant fish are also known to lay egg cases along this coastline.



4.14 PIHAKA POINT (Subtidal)

Pihaka Point is on the northern shore of Queen Charlotte Sound and separates Torea and Kaipakirikiri Bays. Pihaka Point is approximately 6.6 km by sea from Picton.

Assessment of ecological significance

The subtidal shore shelves steeply and is significant due to the presence of giant lampshell¹¹⁸, which occur at relatively few shallow areas in Marlborough^{104,229,312}.

4.15 KUMUTOTO BAY (Subtidal)

Kumutoto Bay is located along the northern shoreline of inner Queen Charlotte Sound, north of Allports Island, and approximately 9.6 km by sea from Picton. It has 5.1 km of coastline, a mouth 1 km wide, and sea area of 154.4 ha. Elephant fish regularly spawn in the shallow part of the bay.

Assessment of ecological significance

This is the single largest area known in the Queen Charlotte Sound where elephant fish regularly lay their egg cases⁹⁰. Shallow elephant fish spawning areas are of international scientific interest^{101,115}.



Blue cod swimming above tubeworm mounds, Perano Shoal (Rob Davidson)

4.16 PERANO SHOAL (Subtidal)

Perano Shoal is an offshore bank in the entrance to Tauranga Bay, 10.7 km east of Picton by sea. The top of the shoal is between 5m and 7m depth and is predominantly exposed bedrock. Below and surrounding the bedrock outcrop are areas of shell and fine sand, approximately 160m long, that are swept by moderate tidal currents.

Assessment of ecological significance

The shoal supports very high densities of tubeworm mounds (*Galeolaria hystrix*) that provide habitat for a variety of other species. The shoal has the largest area of high density tubeworm mounds in Marlborough. Burrowing anemone and dog cockle live in soft sediment between the mounds. Blue cod and scallops are also present.

4.17 QUEEN CHARLOTTE SOUND (Hector's Dolphin Area) (MAP 22)

Queen Charlotte Sound has a resident population of approximately 20 Hector's dolphin¹⁰⁶. Hector's dolphin are most frequently in an area bounded by a line in the north-east from Clark Point to Bottle Rock (Resolution Bay) and south-west from Dieffenbach Point to Ngatakore Point (Ruakaka Bay)

Assessment of ecological significance

Queen Charlotte Sound is home to one of two resident populations of Hector's dolphins in Marlborough and the only area in the Marlborough Sounds.

4.18 PATTEN PASSAGE (Subtidal)

Patten Passage separates Blumine Island from Arapawa Island, a distance of 290m. The Passage is 24.5 km by sea from Picton. The fast tidal currents at this site support a community dominated by filter-feeders. The channel has gently sloping sides with bedrock outcrops in the shallows and soft substrata below 12m depth. Cobbles extend to approximately 12m depth and have occasional tubeworm mounds, jewel anemones, sponge (*Ancorina alata*) and an unidentified anemone. Soft sediments support densely packed dog cockles down to a depth of 25m and are covered with intact and broken bivalve shells.

Assessment of ecological significance

A new species of red algae (*Pugetia* n. sp.) has been recorded from this site⁹⁰. High current habitats usually support greater species diversity at higher densities of certain species compared to adjacent areas and Patten Passage represents one of the better examples in the Queen Charlotte Sound.

4.19 SHIP COVE TO CANNIBAL COVE (Subtidal)

This coastline stretches from Ship Cove north to Little Waikawa Bay along the outer western Queen Charlotte Sound.

Assessment of ecological significance

This coastline is surrounded by a catchment of mature native forest, protected within the Ship Cove Historic Reserve and Cannibal Cove Scenic Reserve. A forest catchment reduces sedimentation into subtidal habitats during floods and this is one of the best examples in Marlborough of such a site. There has not been a biological survey of this marine area.

4.20 PAPAKURA POINT (Terrestrial)

Papakura Point is a headland located in Anatholia Bay along the northern coast of the greater East Bay complex in the outer Queen Charlotte Sound. Papakura is approximately 32 km by water from Picton.

Assessment of ecological significance

This is one of only two gannet colonies in Marlborough⁴². Breeding started here around 2002-2003. There were 60 pairs in 2005 and it is estimated there are now 80-100 pairs breeding that this colony.

4.21 TE AROHA BAY (Subtidal)

Te Aroha Bay has a 3km coastline, a sea area of 67.9 ha, and is approximately 865m across at the mouth of the bay. It is 34 km by water from Picton.

Assessment of ecological significance

The central area of this bay has moderate numbers of horse mussels and associated encrusting species such as ascidians, sponges and hydroids. Between 2002 and 2005 densities averaged approximately 0.5 mussels per square metre^{92,97}. Large horse mussel beds are not common in the Queen Charlotte Sound and this area is an important biogenic habitat.

4.22 PURIRI BAY (Subtidal)

Puriri Bay is a small bay located on the southern shore of Otanerau Bay, East Bay. It has a coastline approximately 2km long, a sea area of 39.4 ha, and is 1040m wide at the bay mouth. The bay is 34 km by water from Picton. There are extensive beds of red algae between 15-23m depth, which are dominated by *Adamsiella chauvinii*. A variety of sponges and hydroids as well as horse mussels and scallops have been observed from the wider bay as well as within the alga beds^{92,97,165}.

Assessment of ecological significance

At 14.3ha, this is the largest known red algae beds in the Queen Charlotte Sound. The red algae *Adamsiella chauvinii* often covers 100% of the seabed in association with a variety of other important species including scallops, giant lampshell and horse mussels.

4.23 MATIERE POINT (Subtidal)

Matiere Point is a headland along the eastern shore of Otanerau Bay, East Bay. The bay is 34 km by water from Picton.

Assessment of ecological significance

The seabed around Matiere Point supports a variety of species uncommon in many areas in Marlborough. Of particular interest are giant lampshell, burrowing anemone, anemone (*Epiactus* sp.) and the habitat forming tubeworm (*Galeolaria hystrix*). These species have been recorded from the site in high densities. The bivalve *Cuspidaria wellmani* is also common at this site. Traditionally this species has been regarded as rare, but NIWA have recorded it from other localities in the Marlborough Sounds in recent years^{165,306}.

4.24 ONAUKU BAY HEAD (Subtidal)

Onauku Bay is situated in East Bay on the north-west side of Arapawa Island. The surrounding land is mainly pasture and scrub with small remnants of regenerating coastal forest. The water is relatively clear because of the lack of streams discharging sediment into East Bay and the bay has a coarse sand/shell substrate.

Assessment of ecological significance

In some years there are very high numbers of scallops in the bay. Their abundance depends on natural ageing and harvest by humans. This site has giant lampshell in deeper areas. Horse mussels are known in the area but are limited by recreational scallop dredging.

4.25 ONAUKU BAY NORTHERN COASTLINE (Subtidal)

This site extends from Onario Point (Anatohia Bay) east to Paerata Point in East Bay.

Assessment of ecological significance

This site supports a wide variety of species that are uncommon or rare in many parts of Marlborough. Of particular interest are giant lampshell, burrowing anemone, anemone (*Epiactus* sp.) and a habitat forming tubeworm (*Galeolaria hystrix*). A 2002 survey⁹⁷ recorded an average density of 1.44 giant lampshells per square metre, between depths of 24m to 32m.

4.26 BLUMINE ISLAND (Terrestrial)

Blumine Island is a large scenic reserve in the main Queen Charlotte Sound. It is approximately 12.5 km in circumference, covers 400 ha, and is 22 km by sea from Picton. King shags roost on the southern tip of the island (B.Cash, DOC, pers.comm.).

Assessment of ecological significance

Prior to 2006, this site was infrequently used by king shags. Presently approximately 18-20 king shags regularly roost at this site with up to 28 birds being recorded. All roosting sites for this rare species may eventually be used for breeding.

4.27 ENDEAVOUR INLET (Intertidal)

Endeavour Inlet is a large complex of bays on the northern shore of outer Queen Charlotte Sound 25km by sea from Picton. Endeavour Inlet has a coastline approximately 30.5 km long and covers an area of approximately 1740 ha. The entrance is approximately 1990m wide (between Edgecombe and Scott Points). Intertidal flats are located at the head of both Endeavour Inlet (6.3ha) and Big Bay (3.6ha) further to the east.

Assessment of ecological significance

The intertidal flats provide habitat for a range of wildlife species typical of comparable estuarine areas in the Marlborough Sounds. Short-jawed kokopu are found in the adjacent streams. All sizeable estuarine areas in Marlborough are considered important as they are a relatively uncommon biological feature.



King shag
(DOC)