

Part 6

CMA – Coastal marine area

APP13 – Coastal and marine indigenous biodiversity habitats and indicative vulnerable species

1. Introduction

This appendix is based on NZCPS Policy 11: Indigenous biological diversity (biodiversity). It has two key parts: **Part A** addresses habitats and **Part B** addresses vulnerable species. The protection of any one component of indigenous biodiversity requires consideration of the multiple interrelationships between areas, habitats and species. Therefore Parts A and B should be read together.

2. Part A: Habitats

- a. A descriptive approach has been taken to identifying marine biodiversity values (rather than mapping areas). The following table identifies biodiversity values by habitat type, recognising that there will be overlapping ranges of habitat types, changes in habitat over time and new or additional data collected over time. This table is structured as follows:
 - i. Terrestrial margins;
 - ii. Estuaries and beaches;
 - iii. Soft-sediment subtidal (non-estuarine);
 - iv. Rocky reefs (hard-substrate dominated; and
 - v. Sea surface and water column.
- b. The values associated with each of these categories are identified, along with key threats.
- c. Note that results of climate change will affect many different habitats and species, and accordingly are not detailed in the table. For example, sea-level rise will affect all shallow subtidal, intertidal, and low-lying terrestrial areas and ecosystems. Increased frequency of storms will affect all marine ecosystems by increasing disturbance and sediment input, and ocean acidification will have implications for many marine food webs.

APP13 – Table 1: Biodiversity values by habitat type

Key habitats	Status and importance for indigenous biodiversity. Key areas are shown in bold.	NZCPS Policy 11 relevance	Key threats
TERRESTRIAL MARGINS			
The indigenous biodiversity value of terrestrial margins falls into three main categories:			
1. Coastal, but non-marine, indigenous habitat and species			

2. Intact marine to terrestrial sequences
3. Habitat for species that cross marine-terrestrial boundaries (roosting nesting haulout sites)

Coastal, but non-marine, indigenous habitat and species	Coastal sand dunes - naturally uncommon ecosystem nationally (nine individual dune sites occur in the Whakatū Nelson area). Threatened or At Risk birds, invertebrates and plants. Tahunanui, Delaware spit, Sand spit at mouth of Whangamoa River.	a(i) a(ii) b(iii)	Weeds Rabbit browsing Disturbance and erosion (human, vehicle) Human and dog disturbance of breeding birds Predation on breeding birds Subdivision
	Coastal forest, shrublands and scrublands - generally rare in the Nelson region, particularly where there is a sequence from wetland to coastal forest. Threatened or At Risk birds, reptiles and plants. Kokorua Estuary, Wakapuaka Estuary, Delaware spit, Margins of Delaware Inlet, Whangamoa Estuary, The Glen to Cable Bay, Nelson Haven, Haulashore Island.	a(i) a(iii) a(iv) b(i) b(ii) b(iii)	Subdivision Weeds Stock access (browsing and trampling) Possum browsing
	Cliffs and rocklands - coastal cliff communities, coastal shrub-herb-grassland communities, coastal dry forest, coastal	a(i) a(iii) a(vi) b(i)	Stock access (browsing and trampling) Weeds Predators

	<p>flaxland and coastal silver tussockland are all rare in the Nelson region.</p> <p>Threatened or At Risk birds and reptiles.</p> <p>The Glen to Cable Bay, North coast of Pepin Island, Delaware Inlet to Cape Soucis.</p>	<p>b(ii)</p> <p>b(iii)</p> <p>b(v)</p>	<p>Possum browsing</p>
	<p>Marginal freshwater wetlands (<i>Gahnia</i> wetland, reedland, rushland and sedgeland communities.</p> <p>Threatened or At Risk birds, fish and plants.</p> <p>All estuaries (Waimea, Nelson Haven, Wakapuaka, Whangamoia / Kokorua).</p>	<p>a(i)</p> <p>a(iii)</p> <p>b(i)</p> <p>b(ii)</p> <p>b(iii)</p> <p>b(v)</p> <p>b(vi)</p>	<p>Sedimentation</p> <p>Enrichment</p> <p>Reclamation</p>
	<p>Boulder Bank and Haulashore Island cobble and boulder habitat.</p> <p>Lizards (including At Risk species).</p> <p>Threatened and locally rare plants and moss and lichen communities. The most intact and healthy vegetation remnants of the Boulder Bank ecosystem is between Boulder Bank drive and Cawthron Aquaculture Park.</p>	<p>a(i)</p> <p>a(vi)</p>	<p>Weeds</p> <p>Predators</p> <p>Rabbit browsing</p> <p>Disturbance (human, dog, vehicle)</p>

	<p>This also adjoins a saltmarsh/shrubland community (possibly valued as Intact marine to terrestrial sequences - refer also below section).</p> <p>Boulder Bank scenic reserve, Haulashore Council Reserve.</p>		
Intact marine to terrestrial sequences	<p>Sandy subtidal and intertidal to beach and dune (see also Coastal, but non-marine, indigenous habitat and species – above).</p> <p>Tahunanui, Delaware spit, Sand spit at mouth of Whangamoia River.</p>	<p>a(i) a(iii) b(iii)</p>	<p>Weeds Rabbit browsing Disturbance and erosion (human, vehicle) Human and dog disturbance of breeding birds Predation on breeding birds Subdivision</p>
	<p>Estuary to coastal forest (see also Coastal, but non-marine, indigenous habitat and species – above).</p> <p>Delaware Inlet, Kokorua Estuary, Wakapuaka Estuary.</p>	<p>a(i) a(iii) a(iv) b(i) b(ii) b(iii) b(v) b(vi)</p>	<p>Subdivision Weeds Stock access (browsing and trampling) Possum browsing Sedimentation Enrichment Reclamation</p>
	<p>Estuary – freshwater wetland (see also Coastal, but non-marine, indigenous habitat and species – above).</p> <p>Kokorua Estuary, Wakapuaka Estuary.</p>	<p>a(i) a(iii) a(iv) b(i) b(ii) b(iii)</p>	<p>Subdivision Weeds Stock access (browsing and trampling) Possum browsing Sedimentation</p>

		b(v) b(vi)	Enrichment Reclamation
Habitat for species that cross marine-terrestrial boundaries (roosting, nesting haulout sites, inanga spawning habitat)	Sand and gravel beaches and dunes used for breeding and roosting by coastal birds. Delaware spit, spit at mouth of Whangamoā River.	a(iv) b(ii) b(v) b(vi)	Weeds Rabbit browsing Disturbance and erosion (human, vehicle) Human and dog disturbance of breeding birds Predation on breeding birds Subdivision
	Cliffs and offshore islet used for breeding and roosting by coastal birds and by fur seals for hauling out. The Glen to Cable Bay, North coast of Pepin Island, Delaware Bay to Cape Soucis.	a(iv) b(ii) b(v) b(vi)	Stock access (browsing and trampling) Weeds Predators Possum browsing
	Coastal trees used for nesting and roosting by shags and herons. Boulder Bank, Haulashore Island, Delaware spit.	b(ii) b(v)	Removal
	Boulder Bank, Haulashore, and nearby artificial structures used for feeding, nesting and roosting by coastal birds (including penguins), and haul-out for fur seals.	a(i) b(ii) b(vi)	Predators Disturbance (human, dog, vehicle)

	Marine/ lowland freshwater interface areas and stream-side habitat used for spawning of fish species such as Inanga (and other whitebait species). (Refer to Nelson Plan Maps).	b(ii) b(iv) b(v) b(vi)	Sediment Disturbances Vegetation removal
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ESTUARIES AND BEACHES

Four estuaries fall within the Nelson Coastal marine area, and state of the environment monitoring surveys have been undertaken in all estuaries. Waimea (largely TDC) and Nelson Haven are adjacent to urban centres, and are highly modified in places. They are nonetheless still important for indigenous biodiversity. Delaware Bay and Whangamoa / Kokorua estuaries are less heavily impacted by human activity. Most species and habitats are common to several or all estuaries. The Back Beach is of particular importance due to the presence of the endemic Back Beach beetle, and therefore warrants special consideration. Other beaches have not been well-studied.

Back Beach beetle habitat	Vulnerable endemic beetle habitat. Back beach intertidal hummocks slightly above MHWS.	a(i)	Sea level rise Habitat damage Disturbance
High intertidal vegetation (saltmarsh, brackish or saltwater rushland and sedgeland)	Bird foraging habitat, including fernbird, marsh crake, banded rail, South Island pied and variable oystercatchers. Fish foraging, breeding and migration pathways, including galaxiids, lampreys, eels and other native fish. East Waimea Inlet of national or international importance for several wader species. All estuaries (Waimea, Nelson)	a(i) b(i) b(ii) b(iii) b(v)	Sedimentation Enrichment Reclamation

	Haven, Wakapuaka, Whangamoia / Kokorua), wetlands around North Nelson oxidation ponds.		
Seagrass	<p>Bird foraging habitat, including South Island pied and variable oystercatchers, and red-billed gulls.</p> <p>Fish breeding and juvenile habitat (including snapper), foraging and migration pathways.</p> <p>East Waimea Inlet of national or international importance for several wader species.</p> <p>Waimea, Nelson Haven, Wakapuaka.</p>	<p>a(i)</p> <p>b(i)</p> <p>b(ii)</p> <p>b(iii)</p> <p>b(iv)</p> <p>b(v)</p>	<p>Sedimentation</p> <p>Enrichment and reduced water clarity</p> <p>Reclamation</p>
Intertidal mudflat and sandflat	<p>Bird and fish foraging habitat, including banded dotterel, South Island pied and variable oystercatchers, red-billed gulls and royal spoonbills.</p> <p>East Waimea Inlet of national or international importance for several wader species.</p> <p>Cockles, ray feeding grounds.</p> <p>Habitat more extensive in estuaries than prior to human settlement due to increased sedimentation.</p> <p>All estuaries (Waimea, Nelson</p>	<p>a(i)</p> <p>b(ii)</p> <p>b(iii)</p> <p>b(iv)</p> <p>b(v)</p>	<p>Sedimentation</p> <p>Enrichment</p> <p>Reclamation</p>

	Haven, Wakapuaka, Whangamoia / Kokorua), beaches.		
Subtidal estuarine areas	<p>Feeding areas for fish and birds.</p> <p>Possible nursery areas for fish species.</p> <p>Migratory pathways for fish species such as galaxiids, lampreys, eels and other native fish.</p> <p>Likely degraded as a result of sediment input.</p> <p>Historically may have included biogenic habitat, including tubeworm mounds, shellfish reefs and more extensive sponge gardens.</p> <p>All estuaries (Waimea, Nelson Haven, Wakapuaka, Whangamoia / Kokorua).</p>	<p>b(ii)</p> <p>b(iii)</p> <p>b(iv)</p> <p>b(v)</p>	<p>Sediment input and (less so) physical disturbance preventing recovery to original state</p> <p>Reclamation, dredging (Haven)</p>
Estuarine sponge gardens	<p>Biogenic habitat, filtering.</p> <p>Monaco-Saxton channel most established estuarine sponge gardens in Waimea Inlet.</p> <p>Monaco-Saxton channel.</p>	<p>b(iii)</p>	<p>Disturbance</p> <p>Hydrological changes</p> <p>Sedimentation</p>
Artificial habitat	<p>Hard substrate such as piles, marina pontoons, concrete 'Mole' in the</p>	<p>n/a</p>	<p>n/a</p>

	<p>Cut, navigational markers, rockwalls.</p> <p>Subtidal / intertidal: Sessile invertebrate and algal communities, many exotic species. Low indigenous biodiversity values, (potential threat as hub for dispersal of invasive species).</p> <p>Port and Marina, The Cut.</p>		
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SOFT-SEDIMENT SUBTIDAL (NON-ESTUARINE)

The majority of the coastal marine area is made up of gently-sloping sands and muds, with patches of coarser-grained material (e.g., identified near the base of reef areas, and as a result of dredge disposal). Shellfish reefs were once much more widespread, but are very depleted. Current sediment characteristics and distribution of shellfish reef is uncertain. For example, shellfish reefs were observed in the entrance to Delaware Estuary in the late 1970s or early 1980s (Paul Gillespie, pers. comm), but it is not known whether these persist. Sediment characteristics were broadly mapped by Mitchell (1986).

<p>Shellfish reefs</p>	<p>Biogenic habitat created by shellfish including mussels and oysters, and horse mussel beds.</p> <p>Filtering of seawater by shellfish improves water quality.</p> <p>Reef structure stabilises sediments and increases biodiversity.</p> <p>Shellfish are recreationally and commercially important.</p> <p>Horse mussel beds known to be mobile.</p>	<p>a(iii)</p> <p>b(ii)</p> <p>b(iii)</p> <p>b(iv)</p>	<p>Disturbance</p> <p>Sedimentation</p>
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	Original extent unknown, currently rare/absent.		
Loose sediment	<p>Invertebrate-dominated, often mobile disturbance-tolerant taxa.</p> <p>Important as habitat for fish food (macroinvertebrates).</p> <p>Historically important for commercially- and recreationally-harvested bivalves, including scallops.</p> <p>Benthic productivity important for shellfish food supply.</p> <p>Homogenised and likely more extensive as a result of sediment input and disturbance.</p> <p>Extent of coarser areas generally unknown, some examples recorded, e.g., shell rubble off Ataata Point.</p> <p>Shells and shellfish near Boulder Bank edge.</p> <p>Extensive.</p>	b(iv)	Disturbance, sedimentation preventing establishment of more diverse communities

ROCKY REEFS (HARD-SUBSTRATE DOMINATED)

The coast from the Glen north contains a large part of the rocky reef habitat in Tasman Bay, the only other area of note being the reefs in Abel Tasman.

The Nelson rocky coast between the Cawthron Aquaculture Park and eastern Pepin Island (area incorporating the Horoirangi Marine Reserve) has been relatively well-studied, less data is available for sites to the north and south.

On the Boulder Bank and Haulashore, movement of boulders in intertidal and shallow subtidal areas limits potential for communities to establish. Seaweed and sponge communities may have been

strongly impacted by the direct and indirect effects of fishing activity and depletion of fished populations.

<p>Reef and seaweed communities</p>	<p>Structure provides shelter, nursery habitat.</p> <p>Seaweeds and other algae provide benthic primary productivity.</p> <p>Intertidal/shallows foraging area for birds.</p> <p>Habitat for reef fish and invertebrates, e.g. echinoderms, ascidians, and kaimoana such as paua and crayfish.</p> <p>Algal and invertebrate communities are broadly similar to those at Long Island (Marlborough) and Abel Tasman (Tasman), also lower western North Island. However, there are important differences, such as the lack of laminarian macroalgae in north Nelson.</p> <p>Seaweed has a patchy distribution throughout rocky areas of whole coastal marine area, not well documented. Likely largely degraded. More dense algal growth in and beyond the northern section of Horoirangi Marine Reserve.</p> <p>Seasonally dominated by invasive <i>Undaria</i></p>	<p>b(ii)</p> <p>b(iii)</p> <p>b(iv)</p>	<p>Overgrazing</p> <p>Suspended sediment – light limiting</p> <p>Sedimentation</p>
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	<i>pinnatifida</i> in Haven / Haulashore.		
Deep (non-estuarine) sponge gardens and bryozoan beds	Biogenic habitat, filtering. At base of Boulder Bank and reefs. Particularly substantial at sites near Glenduan , also present at sites south of and around Pepin Island. Wider distribution and change over time unknown.	b(ii) b(iii) b(iv)	Disturbance Sedimentation
SEA SURFACE AND WATER COLUMN			
Sea surface and water column	Planktonic productivity, seabird (including penguin) passage, resting and foraging. Marine mammal resting and foraging habitat and passage. Benthic and pelagic fish.	b(iv) b(v)	Birds and mammals 1. Disturbance (including noise) 2. Vessel strike 3. Entanglement 4. Productivity 5. Sedimentation

3. Part B: Indicative vulnerable species

a. NZCPS Policy 11(a)(i) and (ii) require the identification of indigenous taxa that are threatened or at risk in the New Zealand Threat Classification Systems lists, and taxa that are listed by the International Union for Conservation of Nature and Natural Resources (IUCN) as threatened, in order to protect these species. The following table is indicative of vulnerable species status and it is recognised that this will change over time. Therefore any activities in the general areas listed below should give consideration to any adverse effects on species listed below and/or as updated from time to time by the Department of Conservation or IUCN.

APP13 – Table 2: Vulnerable species status

Key indigenous species	Sub-sets	Key areas	Species and New Zealand Threat Classification System conservation status
Wading birds	Breeding habitat	<p>Haulashore Island (variable oystercatcher)</p> <p>Delaware spit east and west (variable oystercatcher and banded dotterel)</p> <p>Boulder Bank (variable oystercatcher)</p> <p>Nelson Haven (banded dotterel)</p> <p>Waimea Inlet (variable oystercatcher)</p> <p>Wakapuaka flats (head of Nelson Haven) and the Delaware spit are among four locations in Tasman Bay for regular breeding attempts by banded dotterel.</p>	<p>Banded dotterel (Threatened: Nationally vulnerable)</p> <p>Bar-tailed godwit (At risk: Declining)</p> <p>Lesser knot (Threatened: Nationally vulnerable)</p> <p>Reef heron (Threatened: Nationally endangered)</p> <p>Royal spoonbills (At risk: Naturally uncommon)</p> <p>South Island pied oystercatcher (At risk: Declining)</p> <p>Variable oystercatcher (At risk: Recovering)</p>
	Foraging habitat	<p>Wetlands around mouths of Wakapuaka River and Toi Toi and Frenchmans Streams</p> <p>Kokorua Estuary wetlands</p> <p>Haulashore Island</p>	<p>White heron (Threatened: Nationally critical)</p> <p>Wrybill (Threatened: Nationally vulnerable)</p>

		<p>Delaware spit east and west</p> <p>Boulder Bank</p> <p>Nelson Haven</p> <p>Waimea Inlet</p> <p>Tasman Bay / Cook Strait Important Bird Areas</p> <p>Eastern Waimea Inlet is of national or international importance for variable oystercatcher, pied oystercatcher, wrybill, red knot and bar-tailed godwit</p>	
	Roosting areas	<p>Haulashore Island</p> <p>Delaware spit east and west</p> <p>Boulder Bank</p> <p>Waimea Inlet</p>	
Seabirds	Breeding habitat	<p>Haulashore Island</p> <p>Delaware spit east</p> <p>North coast of Pepin Island</p> <p>Boulder Bank</p>	<p>Caspian tern (Threatened: Nationally vulnerable)</p> <p>Little blue penguin (At risk: Declining)</p> <p>Pied shag (Threatened: Nationally vulnerable)</p>
	Foraging habitat	<p>All subtidal (forms part of Cook Strait Important Bird Area)</p> <p>Haulashore Island</p> <p>Delaware spit east</p> <p>Nelson Haven</p> <p>Waimea Inlet</p>	<p>Red-billed gulls (Threatened: Nationally vulnerable)</p> <p>Sooty shearwater (At risk: Declining)</p> <p>White-fronted tern (At risk: Declining)</p>
	Roosting areas	<p>Haulashore Island</p>	<p>Various passage species of albatross, shearwater, petrel,</p>

		<p>North coast of Pepin Island</p> <p>Boulder Bank</p> <p>Waimea Inlet</p>	<p>prion, tern and gull recorded in Cook Strait Important Bird Area (threat classifications from Naturally Uncommon to Threatened: Nationally critical)</p>
Wetland birds		<p>Wetlands around mouths of Wakapuaka River and Toi Toi and Frenchmans Streams</p> <p>Kokorua Estuary wetlands</p> <p>Margins of Delaware Bay</p> <p>Whangamoia Estuary</p>	<p>Banded rail (At risk: Declining)</p> <p>Marsh crake (At risk: Relict)</p> <p>South Island fernbird (At risk: Declining)</p>
Migratory fish		<p>Wetlands around mouths of Wakapuaka River and Toi Toi and Frenchmans Streams</p> <p>Kokorua Estuary wetlands</p> <p>Margins of Delaware Bay</p> <p>Whangamoia Estuary</p> <p>Nelson Haven</p> <p>Waimea Inlet</p>	<p>Longfin eel (At risk: Declining)</p> <p>Lamprey (Threatened: Nationally vulnerable)</p> <p>Torrentfish (At risk: Declining)</p> <p>Giant kokopu (At risk: Declining)</p> <p>Koaro (At risk: Declining)</p> <p>Īnanga (At risk: Declining)</p> <p>Shortjaw kokopu (Threatened: Nationally vulnerable)</p> <p>Bluegill bully (At risk: Declining)</p> <p>Redfin bully (At risk: Declining)</p>

Marine mammals	Cetaceans	All subtidal, including Nelson Haven	<p>Bottlenose dolphin (Threatened: Nationally endangered)</p> <p>Hector's dolphin (Threatened: Nationally endangered)</p> <p>Killer whale (Threatened: Nationally critical)</p> <p>Other species (Not threatened, but protected under Marine Mammal Protection Act 1978)</p>
	Pinnipeds	All subtidal Intertidal/terrestrial haul-out sites Pepin Island, Boulder Bank, Haulashore	Fur seals (Not threatened, but protected under Marine Mammal Protection Act 1978)
Beetle		Tahunanui back beach	Back beach beetle (<i>Bembidion (Zecillenus) tilyardi</i>) (Threatened: Nationally critical)