Section 1: The Current Situation

THE HEALTH OF THE AQUATIC ENVIRONMENT IS PROTECTED

24. This section provides the best available information on the current situation across the three broad outcomes of the SOI (see paragraph 9). An understanding of the nature, diversity, stability, productivity, and the extent of CIF resources provides information to address fishing and non-fishing impacts on the aquatic environment.

Figure 2: Circulation around New Zealand (Source NIWA – Miscellaneous Chart No. 76).

TF = Tasman Front, WAUC = West Auckland Current, EAUC = East Auckland Current, NCE = North Cape Eddy, ECE = East Cape Eddy, ECC = East Cape Current, WE = Wairarapa Eddy, DC = D’Urville Current, WC = Westland Current, SC = Southland Current, SF = Southland Front, STW = Subtropical Water, STF = Subtropical Front (left diagonal hashed area), SAW = Sub Antarctic Water, SAF = Sub Antarctic Front (right diagonal hashed area), ACC = Antarctic Circumpolar Current, CSW = Circumpolar Surface Water, DWBC = Deep Western Boundary Current (large purple arrows) (after Carter et al. 1998).


Oceanography

25. The dominant oceanographic feature influencing the environment of the CIF is the Subtropical Front. At the Subtropical Front, the nutrient rich cool Sub Antarctic Circumpolar Current from the south mixes with the warm subtropical East Australian current flowing through Foveaux Strait. This mixed water mass is then deflected by the Chatham Rise toward the Chatham Islands. The water temperature of the Subtropical Front varies from 10° C to 16° C in winter and summer respectively.

26. Upwellings and eddies of the Subtropical Front create ideal conditions for plankton and the animals that feed on them, enhancing ocean productivity and resulting in abundant phyto- and zoo-plankton stocks that are the primary drivers of the ecosystem around the Chatham Islands. On the Chatham Rise and in the Subantarctic, the undersea landscape and currents enhance these conditions.

27. The Chatham Rise and Subantarctic fishing grounds provide 60 percent of New Zealand’s fish catch. Most of this comes from areas near the Subtropical Front.

28. Westerly winds affect our ocean currents and the temperatures of surface waters. These vary between seasons and between years, and so affect the patterns of upwelling and nutrient mixing in our seas. This in turn affects how much food is available and how many fish are produced. Like El Niño and La Niña, scientists have found links between these weather patterns and fish abundance in a number of important fisheries. These include scallops and rock lobster.

Trophic interactions

29. Paua are an important herbivore within the inshore ecosystem. There is a large range of paua predators including blue cod, snapper, wrasses, octopus, rock lobster, and starfish. The magnitude and importance of these relationships is unknown. Paua have a close trophic relationship with kina (competitive) and seaweeds (herbivorous).

30. The CRF stocks are found throughout the Chathams area on most reef habitats. Little is known about the magnitude and importance of predator/prey relationships. Butterfish is an important herbivore within the inshore ecosystem and contributes to Chatham’s biodiversity. Little is known about the effect of removing large numbers of CRF species on the ecology of rocky reefs.

31. There are issues concerning the ecological impacts of removing large eels from the ecosystem. Eels are the top predator in the freshwater environment and the larger piscivorous eels play a major role in the freshwater ecosystem. The effect of removing most large eels from some areas, as has been demonstrated from main-stem river fisheries, can alter the community structure and ecosystem function.

32. There is the potential of moving unwanted fauna and flora (“pest” fish, aquatic weeds) through the activity of fishing. The movement of nets and other equipment associated with fishing may move aquatic life between catchments with potential impacts on biodiversity.

Biodiversity

**Draft standard is to identify and maintain biological diversity of the aquatic environment.**

33. Section 9 of the Fisheries Act 1996 outlines environmental principles that must be taken into account by those exercising or performing functions, duties, or powers under the Act that relate to use of fisheries resources or ensuring sustainability. One of these environmental principles is that biological diversity of the aquatic environment should be maintained.

34. New Zealand’s marine biodiversity is to be protected by establishing a network of marine protected areas that is comprehensive and representative of New Zealand’s marine habitats and ecosystems. The New Zealand Biodiversity Strategy aims to achieve a “target” of 10% of New Zealand’s marine environment protected by 2010. MFish and the Department of Conservation (DOC) are jointly responsible for developing and implementing marine protected area policy to achieve this target.

35. The Chatham Islands marine flora is made up of both northern and southern components contributed by branches of the major warm and cold water currents as the Chathams lie in the path of deflected surface water from the north and the south (the East Cape and Southland currents). The Chathams straddle the boundary of the subtropical convergence which is reflected in the summer isotherm of 19°C.

36. The Chatham Islands lie 770 km east from Banks Peninsula and, therefore, have established a degree of endemism (10 seaweeds and 48 molluscs). The marine fauna and flora are also characterised by the number of species from the mainland that are absent. Presumably, the current speed is not sufficient to carry these species to the Islands within the larval life span.

37. Therefore, while having a majority of the coastal species of east coast New Zealand, the 360 km of coastline of the Chatham Islands are sufficiently isolated and separated to be regarded as a discrete biogeographic region under the MPA classification system.

38. Chatham Island itself also possesses one of New Zealand’s largest and least polluted lagoons, Te Whanga. At 24 km length and an area of 18 600 ha, the lagoon’s fish and shellfish fauna consists of a unique mix of truly marine and largely freshwater species.

39. Depth is another factor which influences species distribution and ecosystem composition within the CIF area. Figures 2 below shows the depth range of the CIF area with statistical areas overlaid. Figure 3 shows the MEC 40 Class habitats in the CIF area. Each colour represents areas which have a number of environmental variables in common, such as temperature, depth, tidal current, and freshwater input.
40. Fishing at the Chatham Islands primarily involves set nets, long-lining, and potting for rock lobsters and blue cod.
Figure 2: Map of statistical areas and depth contours in the Chatham Island inshore fisheries area of FMA 4
Figure 3: MEC 40 Class habitats in the Chatham Island inshore fisheries area of FMA 4

MEC Class Key
Offshore Island Biodiversity

41. The offshore island marine environment (less than 100 m deep) can be highly dynamic and the biological composition reflects the stochastic (unpredictable) nature of that environment. This may provide some resilience to the effects of fishing as biota may already be adapted to colonise perturbed habitats in a relatively short time frame, if disturbance does not persist. Fishing methods such as bottom trawling will primarily disturb the seabed and associated biodiversity. Potting or hand-lining is unlikely to have a significant effect on biodiversity.

Benthic impacts

Benthic impacts are impacts on the animals and plants living on, or attached to the bottom of the sea or lake, from high water mark down to the deepest levels (ie, the benthos).

Draft standard will define the permissible level of impact of fishing methods on each habitat identified.

42. In the CIF area, there is little information on the range and location of bottom habitat types. There is little information on the vulnerability of each habitat to the fishing methods used in the CIF.

Reef and finfish

43. The reef fishery is associated with reef areas and the adjacent flat sandy/mud bottom in shallow coastal water. Set netting and line fishing have little direct impact on the reef and sandy/mud benthos other than the physical impact of anchors at each end of the net. Cod potting will have some direct impact on the reef and sandy/mud benthos from the physical impact of each pot on the bottom.

Shellfish

44. The shellfish fishery is associated with intertidal lagoons, harbours and the adjacent flat sandy/mud bottom in shallow coastal water including the surf zone. The methods used to harvest shellfish are covered below in reference to their effect on the benthos.

45. **Intertidal hand-gathering** as a harvest method can range from no implements just human hands to use of implements (for example knives). The impacts of hand-gathering on the environment tend to be localised, minor, and short-lived.

46. **Subtidal dredge.** Subtidal bottom dredges are used for scallops or oysters. These methods modify the structure and stability of benthic habitats and may reduce biodiversity. Hydraulic dredge (for example for surf clams) is not used in the CSF, nor is extraction using water jets (for example for king clam/geoduck).
47. **Subtidal.** Other methods used are potting for paddle crab, octopus and knobbled whelk, one breath diving for paua, kina and sea cucumber. These methods are very specific to the target species and the benthic affects are thought to be very small.

48. Within the areas that are fished for the shellfish in this plan are many other species of animals and plants. Within the typical tidal lagoon there are shrimps, copepods, topshells, snails, immature flatfish and finfish, crabs and periwinkles. These are all impacted by harvesting in their environment.

49. By protruding above the seafloor, horse mussels modify their habitats considerably. They provide shelter and refuge for invertebrates and fish and act as substrata for settlement of sponges and soft corals. Many small invertebrates such as worms, shellfish and small crustaceans also live in the seafloor sediments in and around horse mussel beds.

50. Cockles play an important role in stabilising intertidal lagoons and banks by reducing the transport of finer sediment material. Often the make up of the channels and sediment profiles is influenced by the position of these significant cockle beds and the resultant shell cast. The species may also assist in maintaining water quality through their filter-feeding activity.

**Freshwater**

51. There are no significant concerns about the direct impacts of eel fishing on the environment. The method of fishing for eels is passive and not destructive of the environment. No other freshwater species are known to be targeted in the CIF.

**Habitats of Particular Significance to Fisheries Management**

*Draft standard is to identify and protect habitats of particular significance for fisheries management.*

52. Protecting habitat of particular significance to fisheries management is one of the environmental principles outlined in section 9 of the Fisheries Act 1996. Habitat of particular significance for fisheries management might include:

- spawning areas
- nursery areas
- estuaries
- migratory routes
- areas of particularly high biodiversity.

53. The nursery areas for juveniles of CIF species occur in shallow inshore areas but there is little information on their exact location. Many shallow bays and inlets are a feature of the Chatham Islands.
The fish stocks that occur in the CIF may have connections with New Zealand stocks as the oceanic currents that influence the Chathams could result in juvenile stocks being transported to the Chatham Island area.

Various lakes and creeks as well as the Te Whanga lagoon are habitats of significance that support freshwater eels.

**Associated or dependent species**

Maintaining associated or dependent species above a level that ensures their long-term viability is one of the environmental principles outlined in the Fisheries Act 1996. Associated or dependent species means any non-harvested species taken or otherwise affected by the taking of any harvested species. This can include protected species such as marine mammals, seabirds, corals, bryozoans, and reptiles.

**Protected Species**

Draft standards will define an acceptable level of fishing-related mortality for each protected species

Section 63B of the Wildlife Act 1953 requires fishers to report the accidental or incidental capture of certain marine species (defined as “marine wildlife”) to the Department of Conversation not later than 48 hours after the arrival of the vessel in port. Marine wildlife includes: all seabirds, black coral (Order Antipatharia), red coral, white pointer sharks, and spotted black grouper (*Epinephelus daemelii*).

The Marine Mammals Protection Act 1978 requires fishers to report the accidental or incidental capture of a marine mammal to an officer or a fishery officer (as defined in section 2(1) of the Fisheries Act 1996) not later than 48 hours after the arrival of the vessel in port. Marine mammals include: all species of seal (Pinnipedia), whale, dolphin, and porpoise (Cetacea).

Fishers voluntarily provide MFish with a ‘Non-Fish Incidental Catch Reporting Return’ to report the accidental or incidental capture of marine mammals or marine wildlife (e.g. seabirds). Since there is no legal requirement for fishers to complete this return, insufficient information is available to determine the effect the CIF is having on protected marine species.

It is proposed that a ‘Non-fish / Protected species catch return’ will be introduced in 2007. There will be a legal requirement for all fishers who accidentally or incidentally capture marine mammals, seabirds, marine reptiles, corals, bryozoans or protected fish species to complete this reporting form.

**White pointer sharks**

White pointer sharks are widely distributed throughout the world, being found in the Pacific, Atlantic, and Indian Oceans, as well as the Mediterranean Sea. They have low reproduction rates, with 7 to 14 pups per litter, and are listed on the IUCN Red List with a vulnerable status. The white pointer is vulnerable to fishing and becoming rarer throughout
the world. They are top predators and are reported to feed on a wide variety of prey including bony fishes, sharks, rays, marine mammals, sea birds, squid, octopuses and crabs.

62. Since 1 April 2007, the Wildlife Act makes it illegal to hunt, kill or harm white pointer sharks (also known as “great white sharks”) within New Zealand’s Exclusive Economic Zone (EEZ - 200 nautical mile limit around New Zealand). It is also illegal to possess or trade in any part of a white pointer shark. New Zealand is a signatory to the Convention on the Conservation of Migratory Species of Wild Animals and has an obligation to prohibit the taking of white pointer sharks.

63. Under the Wildlife Act, anyone targeting white pointers can be fined up to $250,000 and imprisoned up to six months. Where a great white is caught inadvertently it must be returned to the sea alive, if possible. If a great white is killed accidentally by a fisher, its death must be registered (see paragraph 53), in which case the fisher will not be prosecuted.

Seabirds

64. Many seabirds are killed accidentally by fishers as seabirds attempt to take fish or bait off of hooks. In the last ten years, 30 species of albatross and petrel have been recorded as caught in fishing operations. The level and species of seabirds killed incidentally in the CIF is unknown.

65. To address the threats to seabirds posed by fishing, in 2004 New Zealand launched a National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries (NPOA Seabirds). The NPOA Seabirds sets out a strategic framework to reduce seabird bycatch to sustainable levels, and to continue to reduce seabird bycatch as far as practicable.

66. The NPOA Seabirds contains a mix of voluntary and regulatory measures to reduce seabird bycatch. Voluntary measures have so far proved effective in some important longline fisheries, but have been slow to take effect in some trawl fisheries, leading to the introduction of regulations to deploy seabird scaring devices on trawlers.

67. The NPOA Seabirds is currently being reviewed to more clearly specify how it will achieve its goals of reducing bycatch in a manner that is consistent with the Minister of Fisheries’ obligations, with stakeholders’ expectations and with objectives-based management plans that are being developed for New Zealand’s fisheries.

Marine Mammals

68. There are currently no specific fishing-related concerns for marine mammals in the CIF area.

Monitoring

69. Monitoring of the fishing-related mortality of marine mammals and seabirds is difficult because of the low level of incidents and the nature of fishing (small vessels with little room for observers). Consequently, monitoring of marine mammal and seabird mortalities associated with fishing of the CIF stocks mostly relies on voluntary reporting (see para 55 above). DOC’s incident reporting programme is reasonably effective for mortalities.

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6 This is for the whole of FMA 4, and includes species caught in trawl fisheries and longline fishing.