



Ministry of
Fisheries
Te Tautiaki i nga tini a Tangaroa

Appendix C - Skipjack tuna information



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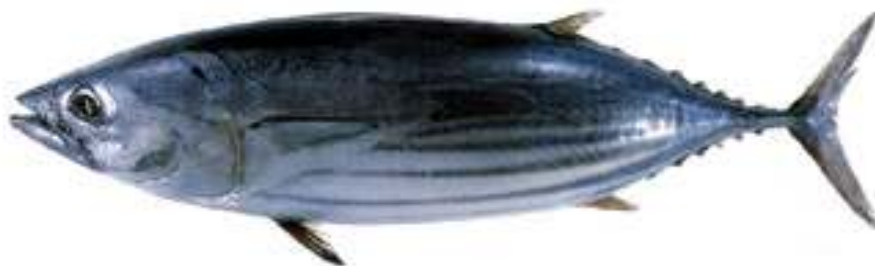
SKIPJACK TUNA INFORMATION

SCOPE OF THIS INFORMATION BRIEF

- 1 This document summarises the current situation for the skipjack fishery under the following headings:
 - **Ecosystem information:** information on the biology of skipjack, and the ecosystems in which it is found;
 - **Use and value information:** how skipjack fisheries are used and the values achieved from them; and
 - **Management information:** how skipjack fisheries are managed, including research and other services currently provided.

Further information:

General information on the management of highly migratory species is contained in a summary document available at <http://fpcs.fish.govt.nz/FishPlanComplex.aspx?ID=27>



AQUATIC ENVIRONMENT

Harvest strategies (international and national)

- 2 The purse-seine fisheries for skipjack tuna (hereafter skipjack) in the Western and central Pacific Ocean (WCPO) can be divided into two main components: a tropical component, that operates throughout the year in calm equatorial waters and provides the bulk of the tuna catch, and a subtropical component that yields much smaller catches, and is highly seasonal. New Zealand has interests in both components of the skipjack fishery.
- 3 The tropical component, or WTP fishery, is located in the area bounded by 10°N and 10°S between eastern Indonesia (about 120°E) and the Phoenix and Line Islands of Kiribati (170°W–150°W). The subtropical component includes the waters of eastern Australia, and northern New Zealand.
- 4 Management of skipjack throughout the WCPO is the responsibility of the Western and Central Pacific Fisheries Commission (WCPFC). Under this regional convention, New Zealand is responsible for ensuring the management measures applied within New Zealand fisheries waters are compatible with those of the Commission. Equally, WCPFC has an obligation to ensure measures it promotes are consistent with those of coastal states.
- 5 Skipjack is not managed as a quota management species. Therefore, no total allowable catch (TAC) applies in New Zealand fisheries waters or on the high seas. However, conservation and management measures (CMMs) set by the WCPFC do place controls on the skipjack fishery (see below, and appendix 1). The purpose of the controls is to limit the mortality of juvenile bigeye and yellowfin in the skipjack purse seine fishery.
- 6 CMM 2008-01 places a variety of controls on the purse seine fishery in order to minimise bycatch of juvenile bigeye including:
 - seasonal closures to fishing using Fish Aggregation Devices (FADs);
 - effort limits;
 - FAD management plans;
 - catch retention; and
 - juvenile tuna catch mitigation research,
- 7 In combination the measures are aimed at reducing bigeye catches by purse seine by 30% over the 3 year period starting in 2009.

Stock status

- 8 Skipjack in the WCPO are considered a single stock for assessment purposes. Skipjack movement is highly variable but is thought to be influenced by large-scale oceanographic variability. Individual tagged skipjack tuna are capable of movements of over several thousand nautical miles, but also exhibit periods of residence around

islands in the central and western Pacific, resulting in some degree of regional fidelity.

- 9 Skipjack are typically a schooling species, with juveniles and adults forming large schools at or near the surface in tropical and warm-temperate waters to at least 40°S in New Zealand waters. Skipjack concentrate in the vicinity of convergence zones between warm low-salinity water and cool high-salinity waters of upwelling. Individuals found in New Zealand waters are mostly juveniles that also occur more broadly across the Pacific Ocean, in both the northern and southern hemisphere. Skipjack tagged in New Zealand are caught throughout the Pacific Ocean, predominantly Fiji, and fish are known to migrate to New Zealand from Australia and Fiji.
- 10 The most recent stock assessment covered the whole WCPO stock. Skipjack tuna biomass within New Zealand's EEZ cannot be assessed, because the proportion of the greater stock found within the zone is unknown and likely varies from year to year.
- 11 The 2008 Scientific Committee report (WCPFC-SC4) concludes the following in relation to the status of the stock: The major conclusions of the skipjack assessment are essentially unchanged from the last three assessments (2002, 2003 and 2005). According to the key conclusions of the models presented, overfishing is not occurring and the stock is not in an overfished state. These conclusions are similar to those based on the 2005 assessment.
- 12 WCPFC-SC4 acknowledged that skipjack catches in 2007 increased to a historical high of ~1.7 million metric tonnes. The SC noted the increasing trend in estimated recruitment throughout the entire time series of the fishery. This trend may reflect skipjack tuna's high productivity relative to other tuna species, as well as its position in the ecosystem. These high recent catches are considered to be sustainable unless recruitment falls persistently below the long-term average. However, any increases in purse-seine catches of skipjack may result in a corresponding increase in fishing mortality for bigeye and yellowfin tunas.
- 13 Although there are no concerns at present relating to the status of the skipjack WCPO stock, there are concerns that current purse seine effort in the equatorial Pacific targeting skipjack is adversely affecting bigeye and yellowfin tuna. Any increases in fishing effort could exacerbate this situation. See the section on ecologically related species for further information on bigeye and yellowfin catches in purse seine fisheries.
- 14 The biomass trends are driven largely by recruitment. Overall recruitment was estimated to be low during the first decade of the model period (1972-82), considerably higher (approx. 60%) during 1982-2000, and at very high levels for the last 5 years. However, there is a high level of uncertainty associated with recent estimates of recruitment. The trend in biomass is consistent with the trend in overall recruitment, with relatively low biomass during the early period, a higher level throughout 1982-2000 and very high levels of biomass (40% higher than the average) in the most recent years.
- 15 The model predicts that the impact of fishing on total biomass is negligible for northern waters (regions 1-4). However within equatorial waters the biomass is reduced by 20% in the east (region 5) and 40% in the west (region 6).

Table 1: Stock status information

Stock	Stock status	Date of last assessment	NZ catches* (tonnes) (2007)	Regional catches WCPO (tonnes) (2007)
SKJ	The latest stock assessment indicates for the skipjack stock in the WCPO, over-fishing is not occurring ($F_{\text{current}} / F_{\text{MSY}} < 1$), and the stock is not in an over-fished state ($B_{\text{current}} / B_{\text{MSY}} > 1$). Exploitation is modest relative to the stock's biological potential. Landings increased in 2007 continuing a trend of annual increases since at least 2001. These high catches are sustainable for SKJ unless recruitment falls persistently below the long-term average.	2008	24,487	1,700, 000

* Includes catches within NZ's EEZ, and by NZ vessels outside the zone.

Productivity

- 16 Table 2 summarises the available information on factors that contribute to the productivity (and level of vulnerability to fishing) for skipjack.

Table 2: Key biological characteristics of skipjack. Note: FL refers to fork length.

Species	Natural mortality rate (M)*	Fecundity	Length/ age at maturity	Max. age/size	Recruitment to commercial fishery	Growth	Spawning / juvenile areas
SKJ	Varies with age; For skipjack <1 year, $M=0.8$; and declines steadily to $M=0.2$ up to age 10 years.	Serial spawners. Highly fecund.	At about 40cm FL and age 1 year	12 years; 34.5 kg; 108 cm Probably few fish live beyond an age of 5 years.	Fishing mortality is low for juvenile SKJ.	The maximum time at liberty for a tagged skipjack of 4.5 years indicates that skipjack grow rapidly (reach 80 cm FL by age 4 years)	Spawning takes place in equatorial waters across the entire Pacific Ocean throughout the year, in tropical waters spawning is almost daily.

Information status and research

- 17 Stock assessments for skipjack are done by the Oceanic Fisheries Program of the Secretariat of the Pacific Community (SPC). WCPFC's Scientific Committee reviews the assessments.
- 18 Recent research activities in New Zealand on skipjack are largely restricted to compiling purse seine catch and effort statistics for the species. However, during 1976 to 1981 the fishery was closely observed and large numbers of fish sampled. Tagging of skipjack was undertaken between 1979 and 1981. Tagged fish released in New Zealand waters were recaptured in Fiji, New Caledonia, Tuvalu, Tonga, Tokelau, Samoa and French Polynesia. Aerial sightings of skipjack schools are recorded from around the NZ coast but analyses have yet to be accepted as an index of abundance.
- 19 The information, analyses, and reports provided by New Zealand form an important technical input for maintaining New Zealand access to the international tuna fisheries. New Zealand is at the extreme southern range for most tuna species including skipjack, so changes in fisheries in New Zealand fisheries waters may be important

indicators for overall stock status.

- 20 The table below summarises information on how skipjack is assessed. There are no fishery-independent indices of abundance for the skipjack tuna. Purse seine catch per unit effort data is difficult to interpret.

Table 3: Current use of information and stock assessment approaches (items in italics are specifically related to the regional stock assessment).

Species	Assessing stock status	Information available	Stock assessment current	Stock assessment future	Research needs
Skipjack	Monitoring catches, catch sampling, and a regional stock assessment	Catch effort, length frequency data, and tag recapture information	MULTIFAN- CL assessment undertaken by the SPC in 2008	MULTIFAN- CL assessment undertaken by the SPC	Abundance index for the purse seine fishery in the tropical region and continued catch monitoring

Further information:

Summary Report of the WCPFC Science Committee for the 2008 meeting
[http://www.wcpfc.int/sc4/pdf/0_SC4%20Summary%20Report%20\[Edited%20Version\].pdf](http://www.wcpfc.int/sc4/pdf/0_SC4%20Summary%20Report%20[Edited%20Version].pdf)

New Zealand Pelagic Fisheries. Medium Term Research Plan 2008/09 to 2009/10. August 2008.
 Prepared by the Ministry of Fisheries Science Group, the HMS Fisheries Managers & the HMS Fisheries Research Planning Group

<http://fpcs.fish.govt.nz/FetchDocument.ashx?DocID=596&Size=798540&MIMEType=application/pdf>

Stock Assessment of skipjack tuna in the western and central Pacific Ocean SPC Noumea SA-WP-4

[http://www.wcpfc.int/sc4/pdf/SC4-SA-WP4%20\[SKJ%20Assessment\]%20rev1.pdf](http://www.wcpfc.int/sc4/pdf/SC4-SA-WP4%20[SKJ%20Assessment]%20rev1.pdf)

Biodiversity

Effects of fishing on biodiversity

- 21 Skipjack consume various species of crustaceans, fish and cephalopods. Examination of stomach contents of the smaller skipjack found in New Zealand fisheries waters suggest feeding on the euphausid (*Nyctiphanes australis*) predominantly with small amounts of pilchard and saury. As skipjack increase in size there is a change of diet to larger prey such as fish.
- 22 Like most of the pelagic species in this plan, skipjack are ‘apex’ or ‘top’ predators. Adult skipjack have few natural predators apart from larger tunas and to a much lesser extent sharks. Animals that hold such a position are thought to play a crucial role in maintaining the health of an ecosystem. Apex predators may exert substantial control over the sizes of the populations of many species on lower levels of the food web. Consequently, they may contribute to the stability of marine ecosystems, and maintain biodiversity.
- 23 Preliminary Ecosim modelling suggests that any decline in predation mortality of skipjack owing to depletion of large predators were overwhelmed by much larger influences due to fishing mortality. However the limited evidence of trophic impacts likely results from the difficulties of applying detailed trophic models to open system in which ecological and fishery data uncertainties are large.

Ecologically related species

- 24 Purse seiners set on a variety of school types or ‘associations’, ranging from schools associated with floating objects, such as logs and other naturally occurring debris, man-made Fish Aggregating Devices (FADs), and dead whales, to schools swimming with live animals such as dolphins, whales and whale sharks.
- 25 Sets are also made on tuna schools not associated with floating objects or other animals; these may be free-swimming schools that are usually feeding on baitfish or schools associated with current interfaces and areas of upwelling. Such sets are collectively termed school sets.
- 26 These associations largely determine the quantity and kinds of by-catch in the fishery. In general the prevalence of fishing on associated schools is mostly in western tropical waters and that on free-swimming schools in eastern tropical and sub-tropical waters.
- 27 Historical data summaries and observer records suggest a low overall incidence of bycatch. There is considerable uncertainty about the accuracy of reported landings however observer data for 1992 determined the bycatch level to be between 0.35-0.77 per cent of the total catch for school sets and between 3.0 and 7.3 per cent for associated sets.

Tropical purse seine fishery

Fish species bycatch

- 28 For the tropical purse seine fishery for skipjack, there are concerns about the bycatch in associated sets of juvenile bigeye and yellowfin tuna, as well as other non-target species including billfish, pelagic sharks, and sea turtles.
- 29 In particular, concerns have been raised about the use of FADs. FADs are defined as any man-made device, or natural floating object, whether anchored or not, that is capable of aggregating fish. Sets associated with FADs tend to have higher bycatch levels than do sets on free-swimming schools, particularly in the western part of the WCPO.
- 30 As noted above, WCPFC resolutions include requirements for FAD management and catch retention plans, as ways of mitigating juvenile bigeye and yellowfin bycatch.

Non-fish species bycatch

- 31 Marine reptiles are known to occur in association with drifting and anchored FADs and current lines of floating debris. Of 493 set observed during 1993/94 the catch rate was 1.34 turtles per 100 school sets and 1.92 turtles per 100 log sets (none of these data from NZ vessels). Most of these turtles were released alive.
- 32 In contrast to the US West Coast yellowfin tuna fishery there is no information to suggest that live marine mammals such as dolphins or whales are deliberately set or caught by the purse seine fishery in the WCPO.

Further information:

Fish Aggregation Devices (FADs). History and current FAD use, FAD management options and FAD management plans. Draft 2007 report prepared by David Itano for the Pacific Islands Forum Fisheries Agency (FFA).

New Zealand Fisheries Waters (sub-tropical) purse seine fishery

Fish species bycatch

- 33 The seasonal New Zealand purse seine fishery for skipjack is based almost entirely on school setting. Between 1976-83, American purse seine vessels operated under license in New Zealand fisheries waters with high observer coverage. Of the 46 species of fish recorded in catches, sharks and rays listed, the most common species were: the sunfish (15.5% occurrence in observed sets); manta ray (8.2%); albacore (7.3%); porcupine fish (5.8%); Of other large pelagic species: blue shark (2.0%); mako shark 1.9%; striped marlin 1.8%; yellowfin tuna 1.3%; blue marlin 1.2%; black marlin 1.2%; thresher shark 0.8%; and broadbill swordfish 0.3%. Some demersal species such as stingrays and flatfish were also taken. Although it is not possible to convert these occurrences to weights, observer records indicate the by-catch of this fishery rarely exceeded 0.5–1 tonne per set.
- 34 More recently, observers have again been deployed on purse seine vessels fishing New Zealand waters (in 2005 and 2006). Table 4 shows the fish catch composition for the four trips covered (see Table 5 for levels of coverage). The fishery is based on school sets of skipjack with minimal bycatch (e.g. 2.5 t out of 410 t). Bycatch of one marlin (a species for which sale is prohibited if caught in New Zealand fisheries waters) was observed.

Table 4: Catch composition from four purse seine trips operating within New Zealand fisheries waters in 2005 and 2006.

Species	Scientific Name	Catch weight (kg)	% Catch
Skipjack tuna	<i>Katsuwonus pelamis</i>	999 858	99.75
Manta ray	<i>Mobula japonica</i>	1 450	0.14
Yellowfin tuna	<i>Thunnus albacares</i>	342	0.03
Sunfish	<i>Mola mola</i>	165	0.02
Slender tuna	<i>Allothunnus fallai</i>	150	0.01
Frigate tuna	<i>Auxis thazard</i>	150	0.01
Striped marlin	<i>Tetrapturus audax</i>	75	0.01
Porcupine fish	<i>Tragulichthys jaculiferus</i>	72	0.01
Flying fish	Exocoetidae (family)	55	0.01
Unid. stingray		15	0
Squid		14	0
Jellyfish		4	0
Albacore	<i>Thunnus alalunga</i>	2	0

Table 5: Purse seine sets observed as a percentage of sets made

Calendar year	No. sets observed	% sets observed	% SKJ catch
2005	37	4.7	4.5
2006	23	3.4	6.7

- 35 Reported catches for 2004-2009 are given in table 6. The reported catches are broadly consistent with observed catches in New Zealand fisheries for 2005 and 2006 waters and for school sets observed elsewhere in the WCPO (see paragraph 25). The proportion of bycatch ranges from 0.80% and 0.13% of the total catch for these years.

Table 6: Reported catch by species when purse seine fishing for skipjack in New Zealand Fisheries waters (CELR data)

Species	2004/05		2005/06		2006/07	
	Kg	%	Kg	%	Kg	%
Skipjack	10,231,504	99.71%	7,188,531	99.87%	10,099,855	99.67%
Jack mackerels	11,700	0.11%	553	0.01%	1,730	0.02%
Blue mackerel	12,050	0.12%	6,700	0.09%	27,195	0.27%
Manta ray	1,000	0.01%	553	0.01%	3,585	0.04%
Sunfish	1,115	0.01%	1,255	0.02%	630	0.01%
Marlins	860	0.01%	450	0.01%	545	0.01%
Flying fish	1,150	0.01%			60	0.00%
Mako shark	20	0.00%			40	0.00%
Porcupine fish	1,150	0.01%			17	0.00%
Dolphin fish						
Yellowfin tuna	243	0.00%			50	0.00%
Blue shark					38	0.00%
Species	2007/08		2008/09			
	Kg	%	Kg	%		
Skipjack	10,109,072	99.35%	4,376,693	99.20%		
Jack mackerels	25,290	0.25%	16,035	0.36%		
Blue mackerel	35,503	0.35%	12,021	0.27%		
Manta ray	3,310	0.03%	4,700	0.11%		
Sunfish	1,590	0.02%	2,120	0.05%		
Marlins	420	0.00%	236	0.01%		
Flying fish	50	0.00%	10	0.00%		
Mako shark	190	0.00%	8	0.00%		
Porcupine fish	212	0.00%	1	0.00%		
Dolphin fish	50	0.00%				
Yellowfin tuna	25	0.00%				
Blue shark						

Non-Fish bycatch

- 36 During the early period of observed fishing (1976-83), 26 common dolphins were caught (with 13 released alive) when purse seining for skipjack. These were likely to be isolated accidental incidents as these catches were reported from only two of the nearly 3000 sets observed (0.2% occurrence in observed sets). Dolphins do not form association with skipjack in New Zealand waters and in most cases seem capable of evading purse seine nets.
- 37 No interactions with non-fish bycatch (e.g. seabirds, turtles, and marine mammals) were observed. Buller's shearwaters, flesh-footed shearwaters, black petrels were often associated with fish schools but observers noted these were not interested in the fishing operation and kept at least 20 m away from the vessel.
- 38 Bottlenose and common dolphins were sometimes observed but the vessel did not set in the vicinity of these dolphins (purse seine operators may be adhering to a 1993

voluntary code of practise designed to reduce the interaction of fishing with dolphins).

Further information:

Incidental fish species taken in the purse-seine skipjack fishery, 1975-81. Habib, G. *et al.* Fisheries Research Division Occasional Publication: Data Series No. 5.

Reconstructing ecosystem dynamics in the central Pacific Ocean, 1952–1998. II. A preliminary assessment of the trophic impacts of fishing and effects on tuna dynamics Sean P. Cox, Timothy E. Essington, James F. Kitchell, Steven J.D. Martell, Carl J. Walters, Christofer Boggs, and Isaac Kaplan

By-catch and Discards in Western Pacific Tuna Fisheries: a review of SPC data holdings and literature <http://www.spc.int/oceanfish/Docs/Technical/TECH34.pdf>

Benthic impacts

- 39 The method of purse seining does not have adverse effects on benthic habitats so long as nets are set in water that is deeper than the depth of the net. However, benthic species have been known to have been taken in purse seine nets, and in these cases benthic impacts can be expected. Purse seine fishing for skipjack usually occurs some distance off the coast. However, shallow water extends offshore for considerable distances on the west coast of the North Island, and in this area there is some risk of benthic impacts, although operators report using shallower nets than those used in tropical fisheries.

USE AND VALUES INFORMATION

Allocations [Authority to fish]

40 All New Zealand fishers authorised to fish within NZ fisheries waters and on the High Seas are subject to a number of requirements. These requirements are imposed through regulation or by fishing permit conditions. These requirements include:

- Gear restrictions
- Area restrictions
- Species restrictions
- Method restrictions
- Vessel length restrictions
- Duration of the authorisation to fish
- Provision of notifications to Ministry of Fisheries
- Carriage of observers
- Vessel inspection
- New Zealand fishing permit holders are required to carry a copy of their fishing permit on board the vessel at all times.

High Seas

41 Paragraph 6 above outlines controls on the skipjack fishery in the international context. New Zealand nationals may only fish on the high seas under the authority of a High Seas Fishing Permit (HSFP), and in other jurisdictions under bilateral or multilateral fishing arrangements. Vessels operating on the high seas must be listed on the WCPFC register of fishing vessels.

NZ Fisheries Waters

Foreign license fishing

42 United States purse seine vessels can fish in some parts of NZ Fisheries waters under foreign license. This is possible due to the Multilateral Treaty between the Government of the United States of America and the Governments of certain Pacific Island Countries that includes New Zealand (commonly referred to as the US Tuna Treaty).

Domestic fishing

43 Skipjack is managed outside of the QMS. There is no catch limit for skipjack. The section on legislation and regulations in the front section of the plan outlines the context in which New Zealand skipjack fisheries are managed.

44 In 2005, the Ministry of Fisheries consulted on introducing skipjack into the QMS. MFish's preferred option was to introduce skipjack on 1 October 2005. MFish considered the current management framework did not adequately provide for utilisation of skipjack. Allocation of rights was seen to provide better incentives for stakeholder involvement in management and utilisation of the fishery. In particular,

existing fishers and new entrants would be able to use the resource without detrimental effects from competitive fishing.

- 45 QMS introduction also facilitates the entry of Māori into commercial fisheries and allows the means for the Crown to meet some of its obligations to Māori under the Settlement Act and the Deed of Settlement 1992.
- 46 MFish also noted potential for further development in the skipjack fishery. MFish considered the existing management framework was not ideal to promote orderly development of the fishery. For example, investment might be hindered because of uncertainty in relation to future allocation of rights. Stakeholders disagreed about whether or not skipjack should be introduced to the QMS, over what timeframe, and which catch history years should be used if it were to be introduced.
- 47 The Minister considered the open access environment adequately provided for the utilisation of skipjack at the time of his decision. The Minister acknowledged the QMS is the preferred management regime for skipjack, but did not see any urgency to introduce skipjack. The Minister wished to provide an opportunity for catch expansion to continue in the interim, so the catch level could be taken into account when setting management measures in the QMS environment.
- 48 In 2006, the decision in principle setting qualifying catch history years for albacore and skipjack from 1 October 2000 to 30 September 2002 was revoked. Alternative catch history years have not been determined.

Further information:

Introduction of New Stocks into the Quota Management System on 1 October 2005. Final Advice Paper. 10 December 2004.

Decision letter including Minister's decision not to introduce skipjack tuna into the quota management system on 1 October 2005.

<http://fpcs.fish.govt.nz/FetchDocument.aspx?DocID=239&Size=140699&MIMEType=application/pdf>

Use and value indicators

Commercial use

- 49 New Zealand has six small domestic purse seine vessels which currently fish exclusively within New Zealand fisheries waters. One of New Zealand's four large super seiners has also fished mainly within New Zealand fisheries waters over the past year. The large super seiner operates primarily off the west coast of the North Island, an area previously only lightly fished by the domestic fleet. The other three large super seine vessels spend most of their time in the tropical Pacific. United States purse seine vessels occasionally fish in New Zealand waters under the US Tuna Treaty¹.

¹ The US Tuna Treaty provides licenses for up to 40 U.S. purse seiners, with an option for 5 additional licenses reserved for joint venture arrangements, to fish for tuna in the EEZ's of Pacific Island Parties including New Zealand. It contains details regarding reporting; an observer program fee formula; provisions on the use of a vessel monitoring system (VMS); and general provisions on fishing capacity, revenue sharing, and linkages between the Treaty and the WCPFC. The agreement was last ratified in March 2002, when the Parties agreed to extend the related

- 50 The level of skipjack catch within New Zealand fishery waters depends partly on whether super seine vessels choose to fish in New Zealand over summer (Jan-May). Factors such as the relative catch rates between the tropical region and the New Zealand zone play a role in determining whether the vessels come south. In recent years the cost of fuel and the attraction of targeting free swimming schools of skipjack has also become important.

Landings and fleet characteristics

- 51 Almost all of the skipjack catch by New Zealand vessels is taken by purse seine. Catches in New Zealand fisheries waters, and by New Zealand vessels outside of New Zealand's zone, can be compared to total catches in the Pacific as follows.

Table 8: Estimated whole weight (t) of SKJ landed by New Zealand flagged vessels in the western and central Pacific Ocean convention area, 2001–2005; and total catches in the convention area. New Zealand in-zone refers to catches within New Zealand fishery waters (200nm of the coastline), and ex-zone refers to catches outside this area.

	2001 [#]	2002	2003	2004	2005	2006	2007*
SKIPJACK (WCPO)	1,131,112	1,302,595	1,299,778	1,400,848	1,468,302	1,537,524	1,700 000
<i>New Zealand In-zone</i>	3,818	3,321	4,035	9,383	10,656	7,247	11,392
<i>New Zealand Ex-zone</i>	5,241	15,812	15,761	10,003	10,746	9,543	15,095
<i>New Zealand Total</i>	9,059	19,133	19,796	19,386	21,402	16,790	24,487
%	0.8	1.5	1.5	1.4	1.5	1.1	1.4

[#] New Zealand in-zone estimates in 2001 may include small amounts of ex-zone catch (<5t)

*Provisional

- 52 Table 9 shows the number of New Zealand-flagged vessels that have operated in the SKJ fishery since 2001.

Table 9: Number of New Zealand flagged vessels fishing for SKJ in the WCPF Convention Area by vessel size class (GRT) and gear type.

Fishing Method	Calendar Year	Total no. vessels	Vessels size range (GRT)			
			0 – 500	501-1000	1001 - 1500	1501+
Purse Seining	2001	9	7		1	1
	2002	11	8		2	2
	2003	9	6		2	2
	2004-07	11	7		2	2

Landings from tropical waters

- 53 Since 2001, two New Zealand companies have operated up to four large ex US super seiners in Tropical waters, principally in the EEZs of various Pacific Island countries and on the High Seas. Skipjack caught by these vessels is landed mostly in American Samoa.

Economic Assistance Agreement between the United States, the FFA and Pacific Island states, for a term of 10 years.

- 54 Fishing practices have evolved to utilise this species in the face of varying international market demand, and varying availability within New Zealand fishery waters from year to year. The purse seine fishery for skipjack cannot be understood without taking into account the other species that the vessels target. For approximately five months of the year (December to May) the purse seine fleet, based in Tauranga, tends to target exclusively for skipjack tuna. When skipjack are not available, this fleet fishes for a mix of other species including jack mackerels (*Trachurus* spp.), blue mackerel (*Scomber australasicus*) and kahawai.
- 55 The catch of skipjack within New Zealand fisheries waters comes predominantly from FMAs 1 and 9, with lesser amounts from FMAs 2, 7 and 8 (Figure 1). The split of catches between the west and east coast is more variable (Figure 1 and Table 10). The amount of catch and effort in a given year depends on the presence of the larger purse seine vessels that sometimes move down from the Tropics to fish within New Zealand fisheries waters during the summer months. These larger vessels tend to fish further offshore and in deeper waters than the smaller domestic vessels.
- 56 For fishing within New Zealand fisheries waters there are independent records of total catches, the monthly reporting by fishers (CELRs and MHRs) and fish receivers (LFRRs). The main Licensed Fish Receivers (LFRs) that skipjack is landed to are Sanford Limited, Amaltal, Pelco NZ Limited, and Talleys Fisheries Limited.

Table 10: Estimated commercial catches (t) from Catch Effort Landing Returns (CELR) of skipjack by fishing year from mainly purse seine fisheries, and reported landings from Licensed Fish Receiver Records (LFRR) and Monthly Harvest Returns (MHR) for New Zealand Fisheries waters.

Year	CELR			LFRR	MHR
	NZ fisheries waters	FMA 8,9	FMA 1,2		
1988/89	0			5769	
1989/90	6627			3972	
1990/91	7408			5371	
1991/92	1000			988	
1992/93	1189			946	
1993/94	3216			3136	
1994/95	1113			861	
1995/96	4214			4520	
1996/97	6303			6571	
1997/98	7325			7308	
1998/99	5690			5347	
1999/00	11 035			10 561	
2000/01	4697			4020	
2001/02	3 726			3487	3 581
2002/03	4 581			2826	3 868
2003/04	10 305			9 225	9 606
2004/05	10 201	5 608	4 624	7 575	10 201
2005/06	7 713	5 263	1 926	7 702	7 702
2006/07	10 119	2 422	7 693	10 761	10 762
2007/08	10 665	2 760	7 349	10 665	10 665
2008/09	4 681	1 023	3 353	4 736	4 737

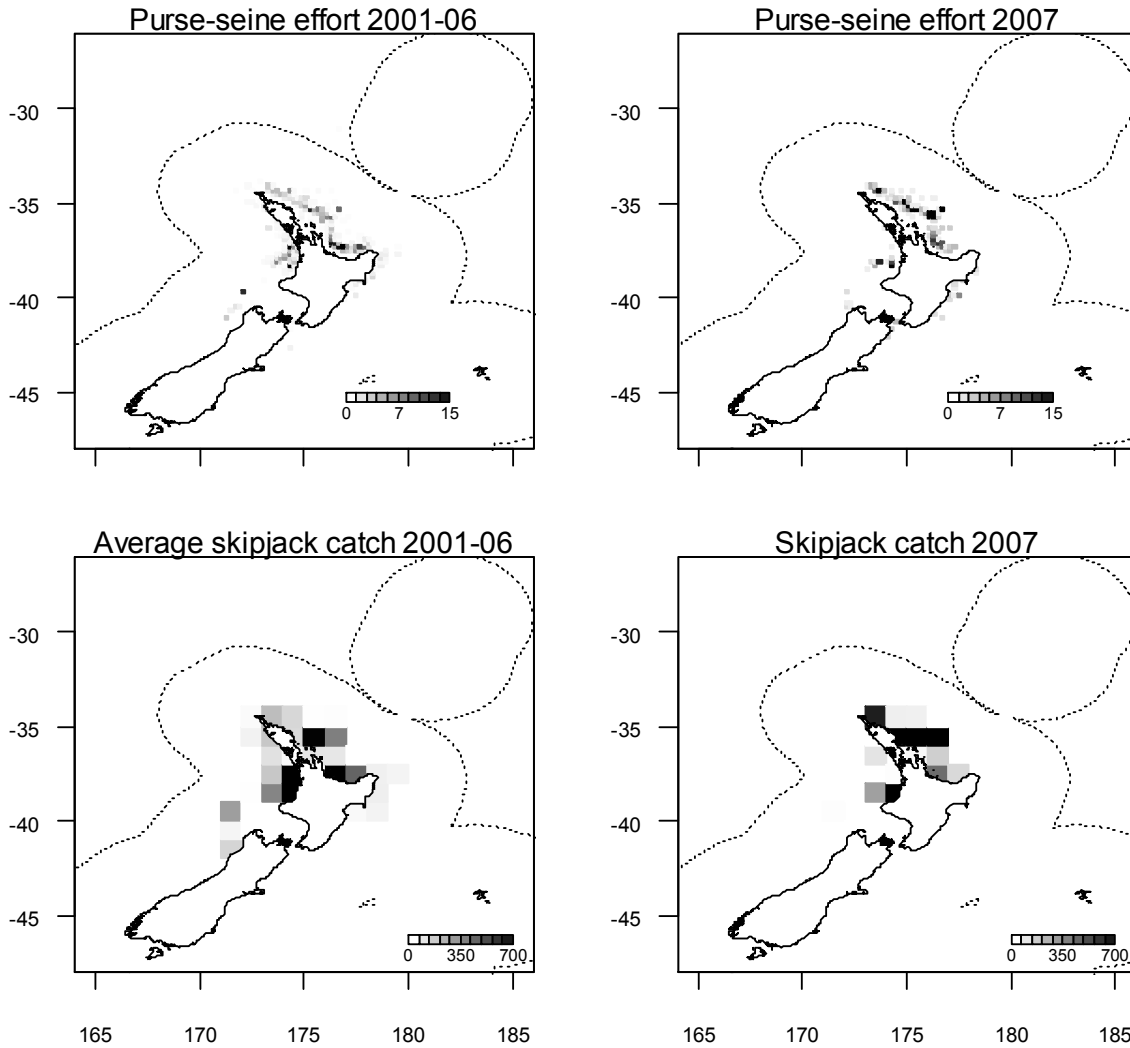


Figure 1: Annual purse-seine effort (number of sets per 1 degree square) for 2001-06 calendar years (average) and for 2007 (top); and annual purse-seine catch of skipjack (tonnes per 1 degree square) in 2001-06 (average) and in 2007 (bottom). Note: some positional data are presented at a NZ statistical area resolution and as some squares represent the centre of these areas they are somewhat over-represented.

Further information:

Characterisation of NZ tuna fisheries in 2002-03 and 2003-04 T.H. Kendrick NZFAR 2006/28
<http://fpcs.fish.govt.nz/FetchDocument.ashx?DocID=593&Size=8267646&MIMEType=application/pdf>

Characterisation of the New Zealand tuna fisheries in 2007 Terese Kendrick HMS2009-13
<http://fpcs.fish.govt.nz/FetchDocument.ashx?DocID=705&Size=468461&MIMEType=application/pdf>

Processing

57 Almost all skipjack is landed whole (greenweight) (table 9).

Table 11: Landed states of SKJ (2007-08 fishing year) (kgs). Note that landings figures returns include some fish that are returned to the sea or eaten on board.

Species	Greenweight	Headed & gutted or dressed	Fish meal	Total
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SKJ	10,838,879	97	15	10,838,991
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Commercial value indicators

- 58 The WCPO accounted for 63% of the global catch of skipjack between 1994 and 2004 (although only 1-2% of that is caught by New Zealand vessels). Most skipjack is sold as canned products, and profitability is generally achieved through volume of sales, rather than value-adding.
- 59 Most tuna caught in New Zealand fisheries waters is exported to overseas canneries. All skipjack is exported frozen whole (table 10). The main export markets for skipjack were Spain, Thailand, and Iran in 2006. There is no domestic price information other than port price (table 13).

Table 62: Export information for 2007 calendar year

Frozen whole	Chilled whole	Frozen fillets	Frozen H&G	Chilled H&G	Chilled other form	Other	Total
Nett weight volume (kgs) of exported catch for year to December 2006							
10,508,753	0	0	0	0	0	0	10,508,753
Value (NZ\$) of exported catch for year to December 2007 (FOB⁺)							
13,383,064	0	0	0	0	0	0	13,383,064
⁺ FOB - Free on board. The value of export goods, including raw material, processing, packaging, storage and transportation up to the point where the goods are about to leave the country as exports. FOB does not include storage, export transport or insurance cost to get the goods to the export market. H&G = headed and gutted							

Table 73: Port price information for HMS stocks

Fishstock	2006/07	2005/06	2004/05	2003/04
SKJ	0.68	0.68	0.68	0.68

- 60 The price received for different sizes and grades of skipjack can vary markedly. Table 14 sets out some indicative prices for skipjack that is the preferred market size (4-7.5 lbs – 1.8-3.4kgs), compared to smaller or larger fish. Of the markets listed below, New Zealand vessels are more likely to land into American Samoa or Bangkok.

Table 84: Price differentials for skipjack of different sizes for canning (Source: FFA).

Market	Under 3 lbs	3-4 lbs	4-7.5 lbs (Main market size)	>7.5 lbs
American Samoa	MP minus US\$434/Mt	MP minus US\$214/Mt	Market price (MP)	MP plus US\$50/Mt
Bangkok	MP minus US\$350/Mt	MP minus US\$150/Mt	Market price (MP)	MP plus US\$105/Mt
Japan	MP minus US\$200/Mt	MP minus US\$30/Mt	Market price (MP)	MP plus US\$100/Mt

- 61 Skipjack is sold as a light meat canning commodity. Prices for skipjack are set on the global commodity market, and can fluctuate markedly from year to year (figure 2). Recent price information indicates that Bangkok prices have risen to record levels.

Prices for skipjack at the market-preferred size (4-7.5lbs, whole round, chilled and frozen) rose slowly from troughs in 2001 until January 2008. Prices increased sharply during 2007 reaching almost US\$2,000 / tonne by January 2008.

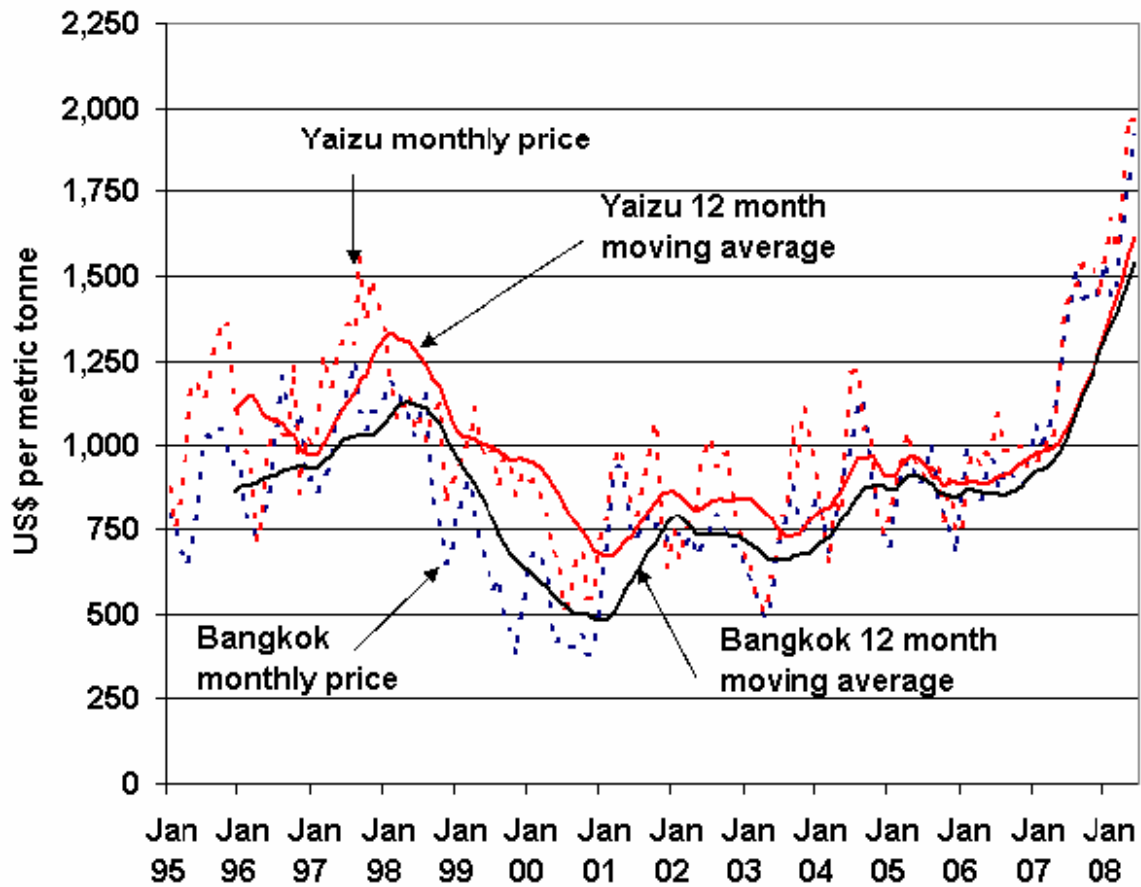


Figure 2: Skipjack prices and 12 month moving average, Bangkok (4-7.5lbs, c & f), Yaizu (ex-vessel). Source: WCPFC-SC4- 2008/ GN WP-1

Recreational use

- 62 Skipjack is sought after by recreational fishers as a light tackle sport fish and for bait. It is available throughout the summer and autumn, ranging south as far as the lower North Island on both coasts. NZBGFC club records list Castle Point, west coast of the North Island, Bay of Plenty and east Northland as areas where recreational catch is commonly reported. Abundance of skipjack is variable between years and although most fish are between 1 and 3kg, individuals are frequently caught up to 10kg or more in weight. Skipjack has a high oil content, but if bled and chilled on capture, the loins are good for sashimi. However, they are less important as fresh fish than the other tunas caught in New Zealand. Most are utilized as whole bait in billfish fishing, or as cut bait for bottom species. Many recreational fishers rely on catching their own skipjack to freeze as bait for the rest of the season, rather than buy commercially caught fish.
- 63 Target fishing for skipjack occurs wherever they are abundant, often using heavy gear for their size (handlines and paravanes) so most skipjack do not qualify to be weighed or recorded by gamefish clubs. Despite that, on average 354 skipjack per year were

recorded as landed on various line classes in club records over the last 13 years. Fast swimming and powerful for their size, skipjack can be challenging to catch on light line (2 to 6 kg).

- 64 Fishers have been actively discouraged from tagging skipjack with the large gamefish tags issued in New Zealand. As with albacore, skipjack are generally landed from December through to May but are known to be present in northern New Zealand for much of the year (Figure 1). Unlike the other tunas, skipjack are often encountered in surface schools which are highly visible. In these circumstances, they are often targeted only until immediate or anticipated requirements are met.

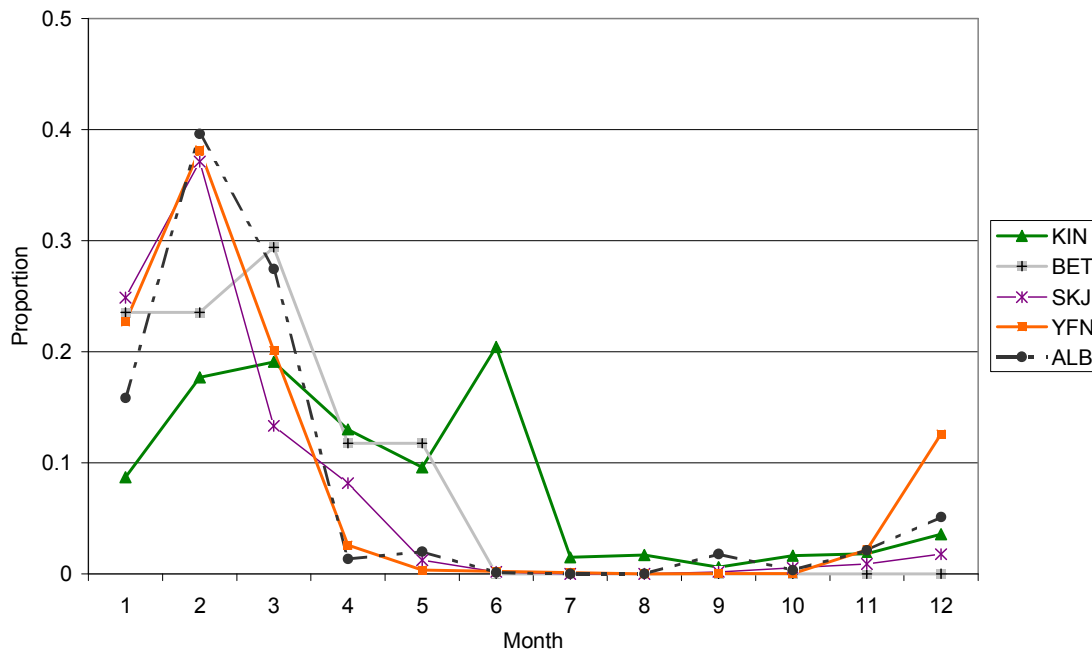


Figure 4. Proportion of catch by month for kingfish and tuna species from NZBGFC club records 1999-00 to 2003-04 (landed and tagged combined, month 1 is January). (Source: Characterisation of the New Zealand Recreational Gamefish Fishery. Final Research Report REC2004/02)

- 65 The main skipjack season coincides with the presence of other blue water predators such as yellowfin tuna, blue and striped marlin which are prime recreational target species. Schools of feeding skipjack help aggregate bait fish into tight schools (meatballs) which attract larger predators and fishers. Finding and fishing around meatballs is a successful strategy that can greatly increase recreational catch rate for marlin and large tuna. Some seasons have quite short periods when conditions are right for the formation of meatballs. This often coincides with the conditions suitable for targeting skipjack with purse seine vessels. Competition for access to skipjack schools has led to conflict between recreational and commercial fishers on and off the water.
- 66 Skipjack do not comprise part of the voluntary recreational tag and release programme, and there is limited information on the size of the recreational catch. Catches are likely to be highly variable between years, recreational diary surveys estimate the number of skipjack taken to range between 2,500 during 1996 and 159,000 during 2000-01. The most recent National Marine Fishing Survey (NMFS) suggests skipjack was the 13th most popular recreational species by numbers caught. Extrapolating numbers landed to weight (assuming 2 kg /fish) provides estimates of

landings in tonnes for each of the NMFS undertaken (see table 15).

Table 95: Number of fish caught and tonnes greenweight for recreational landings of skipjack estimated from diary harvest surveys.

Year	1996	1999-00	2000-01
Number of fish	2,500		159,000
Tonnes	184	313	252

Further information:

Characterisation of the New Zealand Recreational Gamefish Fishery. Final Research Report. REC2004/02. J. Holdsworth K. Walshe, T. Sippel. 2005.

<http://fpcs.fish.govt.nz/FetchDocument.aspx?DocID=514&Size=702473&MIMEType=application/pdf>

Customary use

- 67 Skipjack tuna are referred to as aku in Maori. There is no information on the customary take, but it is considered to be low. Nonetheless, it is known that Maori did travel considerable distances offshore, and did target tuna species (see front section of plan).

MANAGEMENT INFORMATION

Stakeholder engagement

- 68 The advisory group for this fisheries plan is likely to include members from the following groups:
- 69 Customary input into the plan will be facilitated by Pou Takawaenga, and will make use of existing contacts including regional forums.
- 70 Recreational representative groups with an interest in skipjack include the Big Game Fishing Council, the Recreational Fishing Council and Fishing Clubs.
- 71 National bodies include the New Zealand Seafood Industry Council (SeaFIC) the New Zealand Federation of Commercial Fishermen (NZFCF), and the New Zealand Fishing Industry Guild (NZFIG) which represents the interests of the fishing companies, owner-operators and purse seine fishers respectively. The Far Seas Association is the industry body representing skipjack fishers that operate outside NZ fisheries waters.
- 72 Environmental stakeholders including Forest and Bird, the umbrella group of Environment and Conservation Organisations in Aotearoa, New Zealand. (ECO) and Birdlife International have an interest in HMS fisheries.

International obligations

- 73 The WCPFC conservation and management measures that apply specifically to skipjack are in appendix 1. In addition, a summary of New Zealand's implementation of WCPFC conservation and management measures is provided in the front section of this report.
- 74 New Zealand fishing vessels fishing for skipjack on the High Seas operate pursuant to a HSFP (see paragraph 37). HSFPs contain fishing permit conditions to give effect to international management measures as required from time to time by the WCPFC. Other High Seas Fishing Permit conditions include requirements:
- regarding the carriage on board of specified documents including the HSFP;
 - regarding communication standards;
 - to notify details relating to particular voyages;
 - to notify entry/exit from New Zealand fisheries waters, and fishing under foreign fishing jurisdiction or in any restricted area;
 - to notify entry into port;
 - regarding the carriage of observers;
 - regarding inspections;
 - regarding vessel monitoring;
 - regarding the marking of vessels;
 - regarding approval to land to ports outside NZ fisheries waters;
 - regarding prior approval to make transshipments;
 - regarding reporting;

- regarding transit limitations;
- regarding gear restrictions;
- to exclude from the HSFP anadromous fish and those fish stocks covered by regional arrangements that New Zealand is not a party

Further information:

The full text of WCPFC conservation and management measures and resolutions is available at:
<http://www.wcpfc.int/decisions.htm>

Relevant regulations

75 The following are the main regulations that apply to the skipjack purse seine fishery:

- Fisheries (Commercial Fishing) Regulations 2001 and regional commercial fishing regulations;

76 Fisheries (Foreign Fishing Vessel) Regulations 2001;

- Fisheries (Western and Central Pacific Ocean Highly Migratory Fish Stocks) Regulations 2003

Table 106: Fisheries regulations relevant to the skipjack fishery. General regulations relevant to HMS are covered in the front section of the plan.

Regulation	Who does it apply to	Date introduced	Purpose of regulation when introduced
Fisheries (Commercial Fishing) Regulations 2001, r 27(1) The operator, notified user, or master of a foreign-owned NZ fishing vessel that is a skipjack purse seiner must provide notice to the Fisheries Communication Centre 24 hours in advance of an intention to enter or leave NZ fisheries waters.	Commercial	2001	To ensure foreign licensed vessels are managed effectively and risks are minimised while the vessels fish in the NZ EEZ.
Fisheries (Commercial Fishing) Regulations 2001, r 27(2) A foreign-owned NZ fishing vessel used as a skipjack purse seiner must not fish in the NZ territorial sea or in the area between a line due east of Cape Brett (at 35°10.46'S and 174°20.05'E) and a line due north of North Cape (at 34°24.80'S and 173°02.80'E), extending an additional 6 nautical miles beyond the outer limits of the New Zealand territorial sea.	Commercial	2001	As above
Fisheries (Commercial Fishing) Regulations 2001, r 28(1) Foreign-owned NZ fishing vessels used as a skipjack purse seiner must maintain a daily purse seine log, a copy of which must be returned to a representative of the Ministry of Fisheries before the vessel leaves New Zealand fisheries waters.	Commercial	2001	As above
Fisheries (Commercial Fishing) Regulations 2001, r 28(2) A helicopter or fixed wing aircraft pilot flying in conjunction with a foreign-owned New Zealand fishing vessel that is used as a skipjack purse seiner must complete a return of aerial sightings on the approved form for each flight undertaken in support of fishing operations and return the completed forms to the chief executive before the vessel leaves New Zealand fisheries waters.	Commercial	2001	As above
Fisheries (Southland and Sub-Antarctic Areas Commercial Fishing) Regulations 1986, r 3A	Commercial	1986	

Regulation	Who does it apply to	Date introduced	Purpose of regulation when introduced
Use of purse seine nets prohibited in parts of the South Island, including: - Bluff Harbour; the Fiords; Paterson Inlet, Stewart Island.			
Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986, r 5A, r 10A Use of purse seine nets (and other bulk fishing methods) prohibited in certain areas (mostly harbours) in the North Island	Commercial	1986	
Director General of conservation approval required to operate PS (Marine Mammals Protection Act) 17 Purse seining (1) No person shall use any purse seine net for the purposes of fishing unless— (a) That person has in the net an escape panel or aperture from which any dolphin or porpoise can readily escape; and (b) That person follows a fishing practice acceptable to the Director-General. (2) Subject to subsection (3) of this section, the Director-General may, from time to time by notice in the Gazette, grant, in respect of any person or class of persons, or any vessel, vehicle, aircraft, or hovercraft, or any fish, or any waters, exemption from the requirements of subsection (1) of this section, either wholly or partially and either with or without conditions; and may in like manner amend or revoke any such notice. (3) No exemption from the requirements of subsection (1) of this section shall be given in respect of a purse seine net used in fishing for yellowfin tuna. (4) Every person commits an offence against this Act who contravenes subsection (1) of this section or, where any exemption as been granted by notice under subsection (2) of this section, contravenes or fails to comply with any conditions imposed by such notice	Commercial	1978	

Compliance

- 77 Until recently skipjack was a low value species, and operators relied on high volume to maintain profitability. Levy charges are relatively low and there is little incentive to under report catches. Possibly because of the potential for future allocations to be based on catch (both domestically and in the WCPFC context), the opposite incentives prevail.
- 78 Expansion of observer coverage both domestically and elsewhere in the Convention area will improve our understanding of bycatch and how that may vary over time and between regions. In the WCPFC, implementation of centralised VMS (vessel monitoring system) and observer arrangements are seen as important elements of a monitoring, control and surveillance arrangement for HMS fishing in the Convention area.

Specific fishery services

- 79 Costs are levied against a fishery (either as generic costs or as fishery specific costs) as a whole and in the case of non-QMS fisheries average catch is used to determine

the generic component of the levy based on a value index. Specific research costs are allocated directly to the fishery.

- 80 The following tables outline planned research and observer services for these fisheries (tables 17-19), along with cost recovery information (table 18). Appendix 2 lists the details of the research projects that were cost recovered between 2006-08 and general cost recovery information for 2007-08.

Table 117: Scheduled research services (2007/08)

Project	Description
TUN 2005/01	Characterisation of NZ tuna fisheries
TUN2007/01	Characterisation of New Zealand fisheries for skipjack tuna in NZ fisheries waters, in other EEZs and on the High Seas (completion date 30 Sept 2010)
OBS2007/05	Research Observer Services – Pelagic Fisheries

Table 128: Planned research services (2008/09)

Project	Description
PEL2008/02	Analysis of observer data from pelagic fisheries
OBS2007/05	Research Observer Services – Pelagic Fisheries

Table 139: Planned observer coverage 2008/09

Species	Proportion of fishery to be covered	Reason for coverage	Information to be collected
Skipjack	Purse seine: 170 target tuna purse seine days (20% effort for NZ flagged vessels) 70 days small domestic, 30 days super seiners in NZ waters, and 70 days super seiners outside NZ waters	To estimate catches of target species and of fish and non-fish bycatch as required under international obligations	Catch estimates and biological samples and estimate non target catches

Table 20: Cost recovery information (2008-09 levy) for skipjack

MFish Research	MFish Departmental		MFish Observers	Pre unders/overs levy	Total cost recovery levy (\$)
	Compliance	Registry			
\$7,527.28	\$80,551.63	\$39,332.23	\$60,491.44	\$181,025.37	\$181,025.37

Stakeholder measures

- 81 There are voluntary purse seine closures for fishing on all species in place in Parengarenga Harbour, Rangaunu Bay, Doubtless Bay, Cavalli Island, the Bay of Islands, Rimariki Island to Bream Head, the Hauraki Gulf, the Bay of Plenty, Cape Runaway to East Cape, Waikahawai Point to Poverty Bay and Hawke Bay to spatially separate non-commercial and commercial sectors. This agreement is between the New Zealand Fishing Industry Union, Sanford Limited, Nelson Fisheries and the New Zealand Recreational Fishing Council and the New Zealand big Game Fishing Council. These closures are mapped below.

APPENDICES

Appendix 1: Conservation And Management Measures For Bigeye And Yellowfin Tuna In The Western And Central Pacific Ocean.

DRAFT CONSERVATION AND MANAGEMENT MEASURES FOR BIGEYE AND YELLOWFIN TUNA IN THE WESTERN AND CENTRAL PACIFIC OCEAN

WCPFC-2008/DP01 (Final)

A new conservation and management measure for 2009 will apply to bigeye and yellowfin catches as part of purse seine fishing for skipjack in equatorial waters. The draft text is at:

[http://www.wcpfc.int/wcpfc5/pdf/WCPFC5-2008-DP01%20\[Version%20Final_20081212\].pdf](http://www.wcpfc.int/wcpfc5/pdf/WCPFC5-2008-DP01%20[Version%20Final_20081212].pdf)

Appendix 2: research projects

Table 14: Research projects levied for cost recovery in 2006-07, 2007-08, and 2008-09 for skipjack

Project	Project Description	Cost Recovered
2008-09		
GEN2008/01	DNA database for commercial marine invertebrates	\$650.07
2007-08		
TUN2005-01	Characterisation of the New Zealand tuna fisheries	\$3,428.68
TUN2006-01	Commercial catch sampling programme for highly migratory species	\$4,098.60
2006-07		
SAM2005-02	Effects of climate on commercial fish abundance	\$340.31

Table 15: Cost recovery information (2007-08 levy) for skipjack

MFish Research	MFish Departmental			MFish Observers	Pre unders/overs levy	Total cost recovery levy (\$)
	Environmental	Compliance	Statutory	Registry		
\$7,527.28	\$71,268.64	\$2,416.49	\$36,442.35	\$69,139.33	\$186,794.10	\$183,604.76