Recent Catch, Fishing Activity and Data Collection Practices in Regions of the Australian Fishing Zone Included in FAO Statistical Area 57.

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This working paper includes information on Australian tuna fisheries in the Indian Ocean (Robins and Caton 1999) and data collection practices (Caton and Robins 1999) previously presented at the Seventh Expert Consultation on Indian Ocean Tuna, with the addition of more detailed data on catches of tuna and tuna-like species in regions of the Australian Fishing Zone included in FAO Statistical Area 57.

The development of commercial tuna fisheries in Australia in the early 1950s was preceded by many years of recreational game angling and small-scale commercial trolling. Initially domestic commercial operations centred on a pole-and-live-bait fishery off the Pacific Ocean coast of Australia targeting southern bluefin tuna (*Thunnus maccoyii*). This fishery included a bycatch of skipjack tuna (*Katsuwonus pelamis*) and to a lesser extent yellowfin tuna (*Thunnus albacares*) and albacore (*Thunnus alalunga*). These operations spread south to South Australia and west to Western Australia and expanded to other methods of capture including longlining, purse seining and trolling.

Foreign longline fleets, primarily Japanese, were also expanding fishing operations off Australia. They were longlining in the northeast Indian Ocean and in the Pacific Ocean off eastern Australia in the 1950s and progressively expanded further south. The species targeted were the larger pelagics: yellowfin, southern bluefin, albacore, bigeye (*Thunnus obesus*), broadbill swordfish (*Xiphias gladius*), striped marlin (*Tetrapturus audax*), black marlin (*Makaira indica*) and blue marlin (*Makaira mazara*).

When the 200-mile Australian Fishing Zone (AFZ) became operative in 1979 these fleets fished under bilateral arrangements with Australia. From 1988 to 1995 a number of Japanese longliners entered into joint-venture arrangements with Australian companies. Under bilateral arrangements Japanese pelagic longliners continued fishing until the closure of Australian waters to them in November 1997. In 1996, Japanese catches in the Indian Ocean region of the AFZ were around 150 t of bigeye, 50 t of broadbill swordfish, 50 t of albacore, 30 t of yellowfin and small numbers marlin species and southern bluefin tuna.

The structure of the domestic fishery for southern bluefin tuna in Western Australia and South Australia changed markedly in the early 1990s from the initial pole and purse seine operations. Canning operations based on purse seine catches were no longer economically viable following major reduction of the catch by the introduction of quotas. Several vessels turned to pole fishing for the fresh-chilled Japanese export market.
Trolling and pole-and-line operations for southern bluefin tuna in Western Australia

gradually decreased until it ceased in 1991. Experimental cage fattening of southern bluefin tuna was conducted in South Australia in 1991 and proved a successful means to add value to young tuna before export to Japan. In 1997, more than 50% of the Australian quota for southern bluefin was utilised by tuna farms (around 2500 t) and about 2000 t were caught by pole for the fresh-chilled Japanese market. The current trend is for a larger percentage of Australia's southern bluefin quota to be placed into farms for fattening.

Domestic longline operations based on air freighting of fresh tuna to markets in Japan were developed off Western Australia in 1994 in response to the favourable export market to Japan. There are 125 permits that allow operation within tuna fisheries off Western Australia and these permits are currently divided between the Southern Tuna Fishery (includes water south of 34°S in Area 57) and the Western Tuna and Billfish Fishery (WTBF) (includes waters north of 34°S in Area 57). These fisheries have been slow to develop for species other than southern bluefin, however, there was a significant increase in activity in the WTBF in 1998 and this is responsible for the increase in domestic longline fishing activity in Area 57 (Figure 1). Over 20 different domestic longline vessels operated in the WTBF in 1998 and eight of these vessels had catches of tunas and billfish that exceeded 35 t each. Prior to the second half of 1998, less than five longliners were active in most months and confidentiality agreements require aggregation of data before public dissemination. There is a clear seasonal pattern to activities of the tuna pole and purse seine vessels, which fish predominantly for southern bluefin tuna (Figs. 2 and 3).

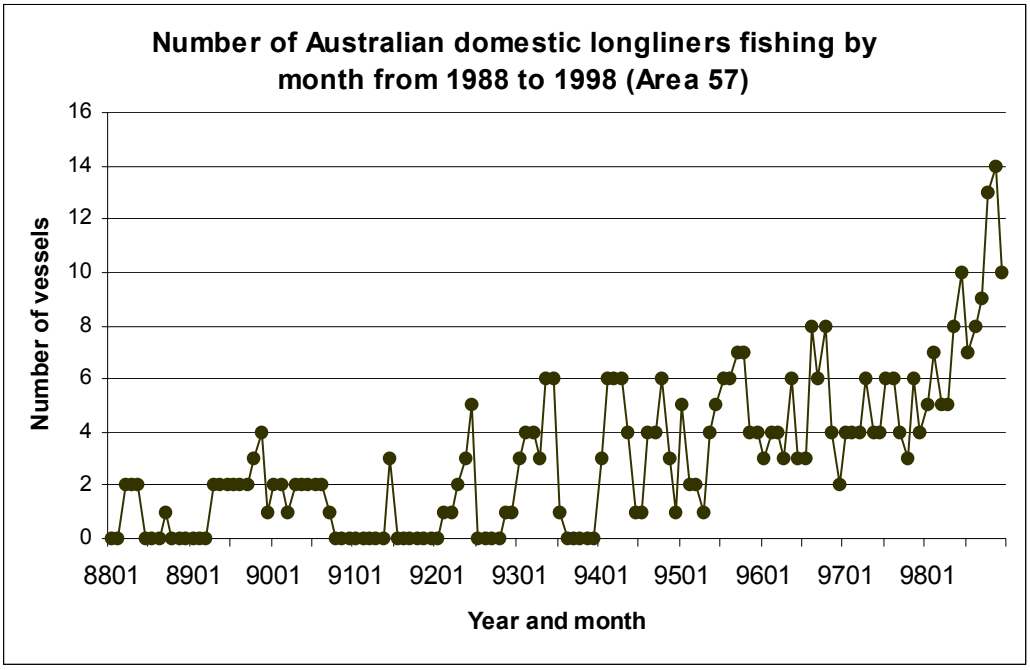


Figure 1. Number of Australian domestic longliners fishing by month from 1988 to 1998 in the region of the Australian Fishing Zone included in FAO Statistical Area 57.

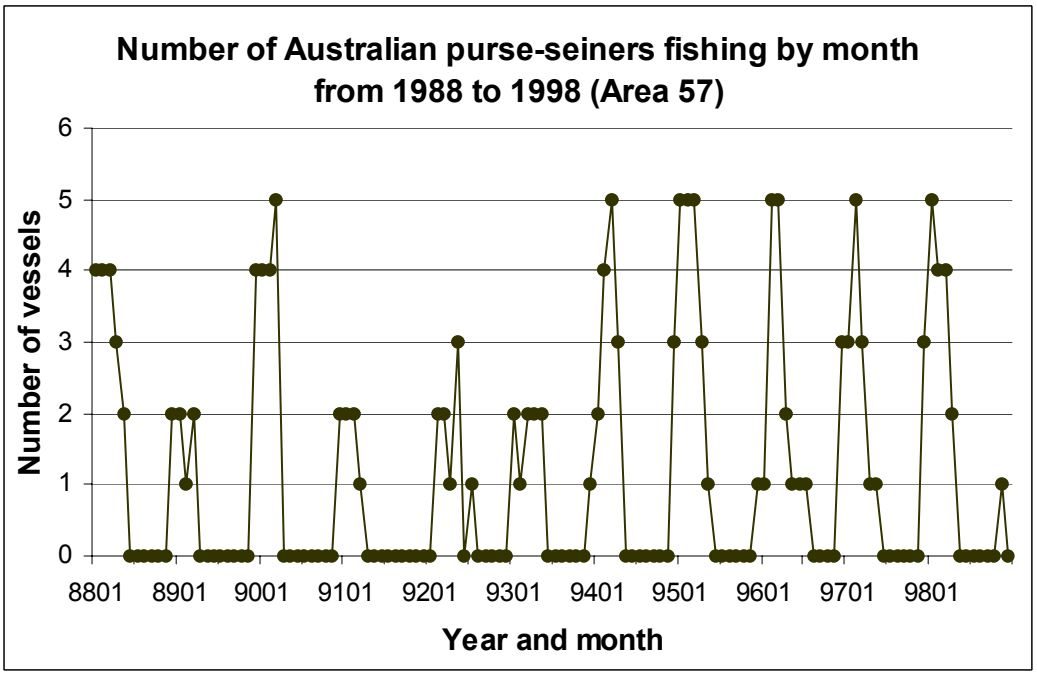


Figure 2. Number of Australian domestic purse seiners fishing by month from 1988 to 1998 in the region of the Australian Fishing Zone included in FAO Statistical Area 57.

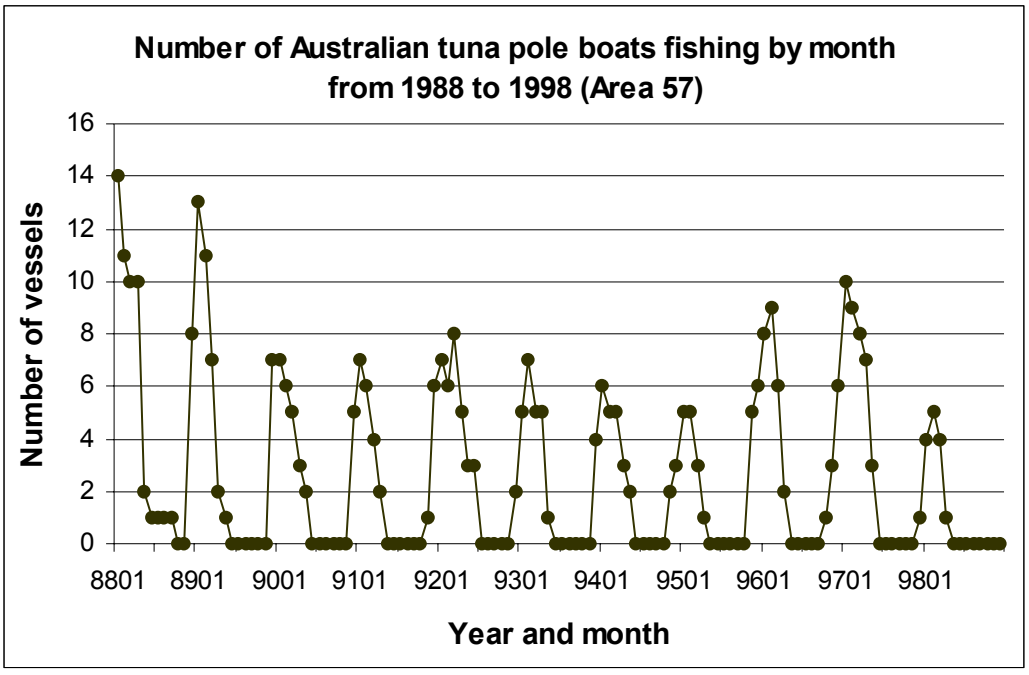


Figure 3. Number of Australian domestic tuna pole boats fishing by month from 1988 to 1998 in the region of the Australian Fishing Zone included in FAO Statistical Area 57.

Catches of tuna and tuna-like species other than southern bluefin tuna have increased in the past year, but for most species have yet to reach the catch levels attained by joint

venture operations up to the mid-1990s. In 1998, combined catches from all gear types in regions of the AFZ within FAO Statistical Area 57 included 4194 t of southern bluefin tuna, 319 t of broadbill swordfish, 269 t of yellowfin, 184 t of bigeye and 25 t of albacore. Annual catches from 1988 to 1998 for tuna and tuna-like species in the region are presented in Table 1 and data from selected species are plotted by year and gear type in Figure 4.

Data Collection

The principal form of data collection for tuna and tuna-like species is through logbooks. Various logbook designs have been used in Australian fisheries for tuna and tuna-like species since 1960. Copies of forms used by the Australian Commonwealth Government have been provided in Majkowski and Morris (1986) and Caton (1991). The logbooks currently in use (Appendix A) are:

- Australian Pelagic Longlining Daily Fishing Log [code 'AL04'] (used predominantly by the small vessel monofilament longline fleet);

- Australian Purse Seine and Pole Daily Fishing Log [code 'TPB02'] (used by the domestic pole and purse seine vessels); and

- Australian Tuna Minor Line Daily Fishing Log [code 'OT03'] (used by small domestic troll, rod and reel and handline vessels).

The last three logbooks were introduced in 1997. Their precursors (versions AL03, TPB01 and OT02) were introduced in 1996 and were presented in Caton and Robins (1999).

The AFZ Catch Record logbook [code 'TL04'] that was used by Japanese, joint venture and charter longliners, was in use from 1983. Beginning in 1995, these longliners were required to record daily by satellite transceiver to the Vessel Monitoring System (VMS), and ultimately it was intended that the VMS would replace the logbook system. Both systems, however, were still in use when Japanese longliners were excluded from the AFZ in 1997. The logbook records had not been punched after 1995, but were used to correct VMS records when necessary (Caton and Robins 1999).

Time spans for which data were gathered with the various logbook versions are shown in Caton and Robins (1999) and Majkowski and Morris (1986) provide details of the time periods over which earlier versions were used.

Percentage coverage of the domestic fishery has varied and has been related to the extent of field support. Under representation is the most common feature, but in some circumstances the logbooks may have over reported catches and effort. Over reporting may have occurred when fishers have sought to establish an activity history in an attempt to secure access where restricted entry or catch limits are to be established for a fishery. Attempts have been made to incorporate adjustments for this in annual statistics where

reasonable estimates of the nature of these problems can be made, but the logbook data provided by fishers are not adjusted.

Validation of domestic logbooks has only been practical to date for the southern bluefin tuna component, where strict monitoring of a system of individual transferable quotas has occurred since their introduction in the domestic southern bluefin tuna fishery in the early 1980s. For this reason, these quota data are used as the indicative southern bluefin tuna base statistics. The catch against quota is monitored by quota reporting forms. These track landings, product type and movement between the catcher and the processor of southern bluefin tuna product.

In 1995, as system of receiver permits, supported by a monitoring program, was established for the southern Australia region, initially for southern bluefin tuna. The system was extended to the eastern coast of Australia in 1997 and expanded to include all fisheries. It is likely that it will be introduced into western fisheries in the near future. This should facilitate validation of logbook reported catches of all species.

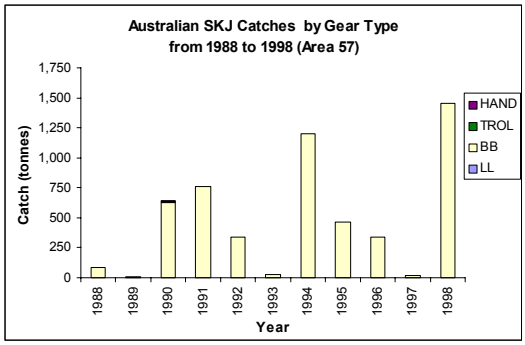
The Australian Fishing Zone Information System

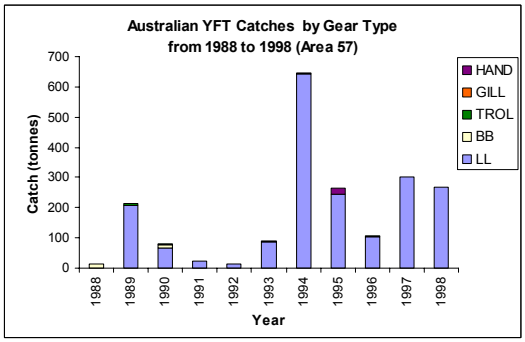
The Australian Fishing Zone Information System (AFZIS), developed as a cooperative system among the Commonwealth Department of Primary Industry, CSIRO, and State fishing authorities was the main repository of fleet, catch and effort information for foreign and predominantly Commonwealth managed domestic fisheries. The database incorporates logbook/radio/VMS catch and effort data, licensing/quota monitoring data and some ancillary observer and size composition data. These monitoring data are maintained by the Australian Fisheries Management Authority (AFMA), but no longer formally as 'AFZIS'.

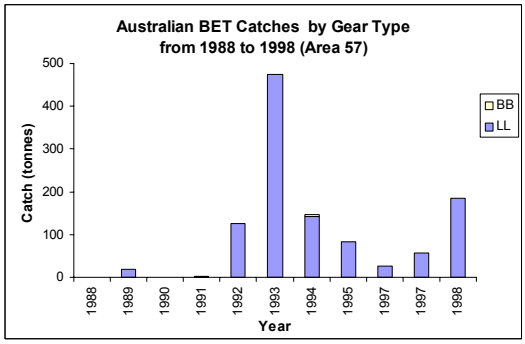
The logbook/radio/VMS/observer database is no longer easily accessible by outside-AFMA users. It is regarded by AFMA as essentially its corporate database rather than a cooperative database. Confidentiality provisions are specified in logbook regulations and, in association with this, security barriers are imposed to control access to data. Domestic users (e.g. the Australian Bureau of Rural Sciences and CSIRO) and international bodies (e.g. the Secretariat for the Pacific Community and Indian Ocean Tuna Commission) are required to sign deeds of confidentiality that contain provisions about the nature and purpose of use of the data. The outputs are provided as data 'dumps' on disk from time to time, impeding real-time access to update data holdings. Also, in some circumstances individual fishers' data must aggregated before release in order to maintain commercial confidentiality. While users contribute to identification and correction of errors in the holdings, there is no routine arrangement yet for notification of errors or feedback about required data revisions. When AFZIS was established a user group was formed to coordinate resolution of issues such as data access and maintenance. Broader collaboration between the Commonwealth and States was facilitated by a Fisheries Statistics Working Group, but this group lapsed in the late 1980s and a similar role is now performed by the recently formed Commonwealth Fisheries Data Users Group.

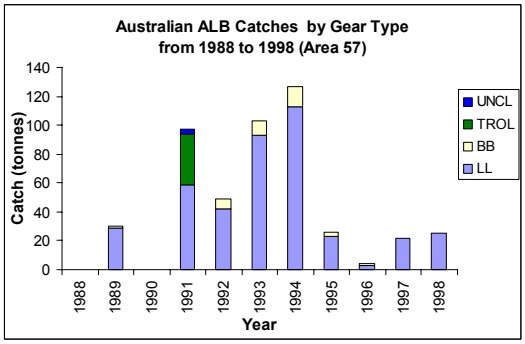
Table 1. Annual catches (tonnes) of tuna and tuna-like species by all gear types in the region of the Australian Fishing Zone included in FAO Statistical Area 57.

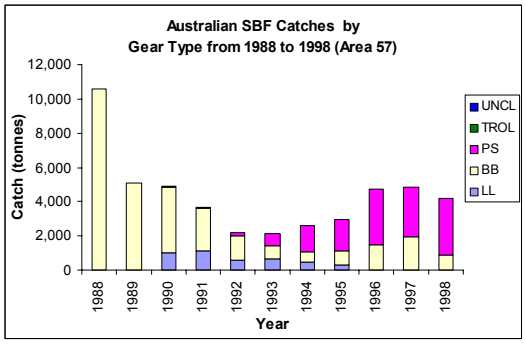
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Katsuwonus pelamis (SKJ)	8	12	639	761	334	29	1,203	407	337	13	1,451
Thunnus albacares (YFT)	12	216	80	23	14	91	647	263	107	303	269
Thunnus obesus (BET)		19		3	125	475	146	84	25	56	184
Thunnus alalunga (ALB)		30		97	49	103	127	26	4	22	25
Thunnus maccoyii (SBF)	10,578	5,072	4,896	3,657	2,184	2,152	2,587	2,934	4,753	4,833	4,194
Thunnus tonggol (LOT)		19	52	14	13		2	1			
Scomberomorus commerson (COM)		216	211	387	325	445	512	444	471	621	
Scomberomorus spp. (KGX)	310	110	131	152	119	112	128	89	131	171	
Xiphias gladius (SWO)		37		3	32	189	115	62	22	42	319
Makaira mazara (BLZ)		12				1	33	4		2	
Tetrapturus audax (MLS)		42		1		3	10	7	3	17	12
Sharks (SHK)					10	19	6	20	1	22	24
Acanthocybium solandri (WAH)									1	4	4

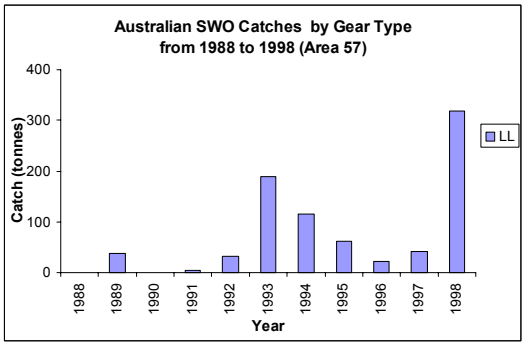


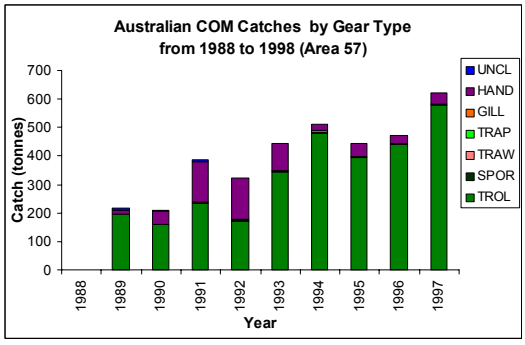












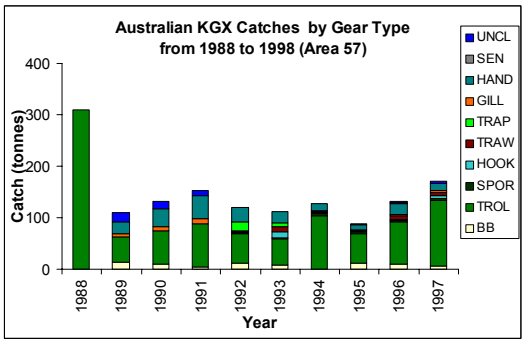


Figure 4. Catches of selected tuna and tuna-like fishes in the region of the Australian Fishing Zone included in FAO Statistical Area 57.

References

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