

PACIFIC TUNA TAGGING PROGRAMME WP 2

CRUISE REPORT No. 4

25th April – 18th May 2009

INTRODUCTION

This report summarizes activities of the fourth cruise of the Pacific Tuna Tagging Programme (PTTP) WP2 during a 25 day period following inbound clearance to Kiribati on arrival in Tarawa on April 24th until arrival in Tuvalu on 19th May 2009.

Scientific personnel onboard the Soltai 105 during Cruise 4 are listed in Table 1.

Table 1. SPC and In-Country personal onboard during Cruise 4

Name	Title	Affiliation	Period
David Itano	Cruise leader	SPC contractor	25/4/09 – 7/5/09
Shelton Harley	Scientist	SPC	25/4/09 – 7/5/09
Thomas Usu	Tagging tech	SPC contractor	25/4/09 – 10/5/09
Waibenua Atema	Observer	Kiribati Fisheries	28/4 - 5/5 & 10/5 -15/5
Bruno Leroy	Cruise leader	SPC	05/5/09 – 19/5/09
Masaru Okamoto	Observer	Temaiku Eco Farm	05/5/09 – 07/5/09
Valerie Allain	Scientist	SPC	07/5/09 - 19/5/09

GENERAL DESCRIPTION OF SEARCHING AND FISHING ACTIVITY

The vessel cleared customs and immigration formalities in Tarawa on 24 April where cultured milkfish situation was assessed. April 25th was spent searching around Butaritari in a counterclockwise direction. Only two small bird schools sighted and no tuna seen or caught. Ran south to Abaiang on the 26th, finding a mixed skipjack/yellowfin school just north of Abaiang for 378 releases. After successful baiting in Abaiang, several mixed schools were fished in the area of north Abaiang for 2763 releases. This area seemed to hold a good area of tuna schools (primarily 43 cm skipjack) that was fished throughout the cruise.

On April 28th no schools were found in the area fished the day before but skipjack schools were located and successfully fished to the east where a current line had set up off east side of Marakei Atoll. The vessel continued to search south to Maiana Bank, arriving at 1700, locating a very fast biting school of bigeye that came up after 1720 and bit till bait supplies were exhausted.

The vessel returned to Betio port in Tarawa on 29th April to re-provision, bank and load cultured milkfish from the Temaiku Eco Farm. Due to the productive baitground located at Abaiang only a half load of milkfish were loaded into three wells. Approximately 16,000 milkfish were loaded in several truckloads estimated to equal about 140 buckets of bait. Unfortunately, the size of most of the milkfish loaded was well over 10 cm and far too large for skipjack chum.

After topping up with bait at Abaiang the vessel steamed out early to arrive at Maiana Bank before dawn finding a fleet of 5-6 m wooden motorized trolling skiffs. Found fast biting skipjack school on the Bank with some bigeye trying to come up to the chum but trolling skiffs quickly put them down. Smaller number of skiffs switched to jigging for bigeye later in the morning and a few large yellowfin and one bigeye was jigged for archival tagging. The vessel continued south to Abemama for baiting, fishing five skipjack schools off the east side of Maiana Atoll. May 1st the vessel searched in the slot between Abemama and Kuria/Aranuka Atolls but did not find any schools until the NW corner of Abemama where island associated skipjack schools were fished for 681 releases that included a small number of yellowfin.

Most of the bait loaded in Abemama was very large sardine with a short life expectancy in the baitwells, so returned to Maiana Bank where large tuna capable of eating them could be found. The large chum with large milkfish were used on large yellowfin with bigeye coming up again at 1715 hrs until bait supplies were used up by 1820 hrs. The only reliable baitground at Abaiang was revisited and a full load of blue sprats taken to north Abaiang where skipjack schools had been found on 27-28 April. Several fast biting schools of skipjack were fished from the NW to the North side of Abaiang for a total of 4134 releases most of which were 42 – 48 cm skipjack.

May 4th saw a return to Maiana Bank in the afternoon, encountering conditions that were quite different from previous visits with bright sunny weather, no current line and fewer boats. Handling was slow with the larger yellowfin a bit line shy in the bright calm conditions. Standard poling began at 1600 on a school of smaller yellowfin. Eventually larger yellowfin came in and a total of 12 yellowfin were tagged with archival tags. The school was fished until sunset but the bigeye never came up.

The vessel returned to Betio on May 5th to pick up incoming Cruise Leader Bruno. The Kiribati fisheries observer disembarked allowing space for Masa Okamoto of Temaiku Eco Farm to board. Proceeded to Maiana Bank arriving at 1515 hours. One school of large yellowfin was fished with handline and two-pole gear for archival tags. Later in the day a second school was chummed resulting in a fast biting school of large yellowfin on the same gears. Large bigeye came up at 1845 and bit until bait supplies were exhausted at 1930 hrs.

On May 6 the vessel circumnavigated Abaiang Atoll, fishing 3 schools, mostly skipjack (one school of large fish around 70 cm) for a total of 835 released included one archival tag deployed in a large skipjack. The vessel returned inside Abaiang lagoon for baiting.

After the night baiting in Abaiang, the vessel returned on the 7th May to Tarawa for personnel change (departure of CL Itano and scientist Shelton H., arrival of scientist Valerie A.). After loading water, vessel went fishing Maiana Bank in the afternoon; after a slow start, large yellowfin started to bite and bigeye also show-up at 18:20. Returned to Abaiang bait ground after 741 released including 509 bigeye.

Started fishing NW of Abaiang on the 8th May and moved SW during the day until bait exhausted. Ended-up 35 miles west of Tarawa entrance with 1942 fish tagged including 1780 skipjack and 162 yellowfin. Come back into Tarawa harbor at 2115 and spent the night at anchor.

The 9th and 10th May were spent at the dock in Tarawa for full moon break, getting water and provisions. Vessel left the harbor at about 15:00 on Sunday to go to Abaiang baitground. After loading bait in 2 sets, S105 started steaming in the night in direction of Abemama atoll.

Arrived at the North point of Abemama at about 7:30 in the morning of the 11th and decided to pass on the west side of the island to be protected from some easterly swell in 15 knts ENE. The vessel

steamed to Nonouti and to Tabiteuea were it drifted for the night. Few schools sighted for only 83 fish tagged.

On the 12th, S105 fished the north point of Tabiteuea for 168 (included 3 archival in SJ) releases and then steamed to Nonouti where a few fish (58) were tagged in the south and found a school that provided 431 bigeye, 66 skipjack and 192 yellowfin about 10 nm in the WNW of the island. The vessel steamed to Abemama that was reached at about midnight and drifted till morning.

Only kawakawa schools were found on the 13th around Abemama. Baiting at night in the lagoon provided baits mostly unsuitable for chumming (*Selar sp.*).

Fished Maiana bank late afternoon on the 14th. Tagged 95 fish with the small bait we had but after these were exhausted we couldn't keep the fish at the boat with the akules. Found another school with big yellowfin but tagged only 4 fish as these were too big to pole even with 3 poles together. Total for the day: 99 tagged (32 S, 63 Y and 4 B).

The vessel returned to Betio port in Tarawa on 15th May to reprovision, bank, refuel, water and Custom clearance out of Kiribati. This was delayed to the morning of 16th after one night baiting in Abaiang.

The vessel started steaming toward Tuvalu after clearance. 17th and 18th were spent steaming and looking for fish along the track but only on the morning of the 18th were some good schools of big skipjack spotted. Unfortunately we ran quickly out of bait as most of them died during steaming time. Only 30 fish were tagged included one archival.

The track of the cruise in Kiribati EEZ, based on school and 1800 positions, is found below as **Figure 1** and a summary of general movements and tag releases follows as **Table 2**. A compilation of the daily log extracts, detailing daily activities, is provided as **Appendix 1**.

TAG RELEASES

Of the 25 days of charter, 24 were spent in the Kiribati Gilbert Islands and one in the Tuvalu EEZ. 18 days were spent searching and fishing, one day steaming and 6 days were spent in port, for provisioning, refuel/water, crew changes, clearances and also a full moon break on the 9-10 May.

A total of 16,736 tuna were tagged and released, including 132 archival tags. 18% were released on free schools, 26% associated with seamounts (Maiana Bank, between Tarawa and Maiana atolls) and 56 % associated with island or reef. Although no floating objects or FADs were fished during cruise 4, Kiribati-Gilbert Islands EEZ revealed a good percentage of bigeye (16% of the releases, the biggest % of all previous PTPP cruises), mainly fished on Maiana bank but also near Nonouti atoll.

The Cruise 4 releases are summarized by tag type and date in **Table 3**, while **Figure 2** below shows the relative distribution of the releases in Kiribati waters by 1 degree square, by species.

Figure 1. Cruise track during WP 2 Cruise 4, 25 April – 15 May 2009, showing 1800 hrs position and the positions of schools fished

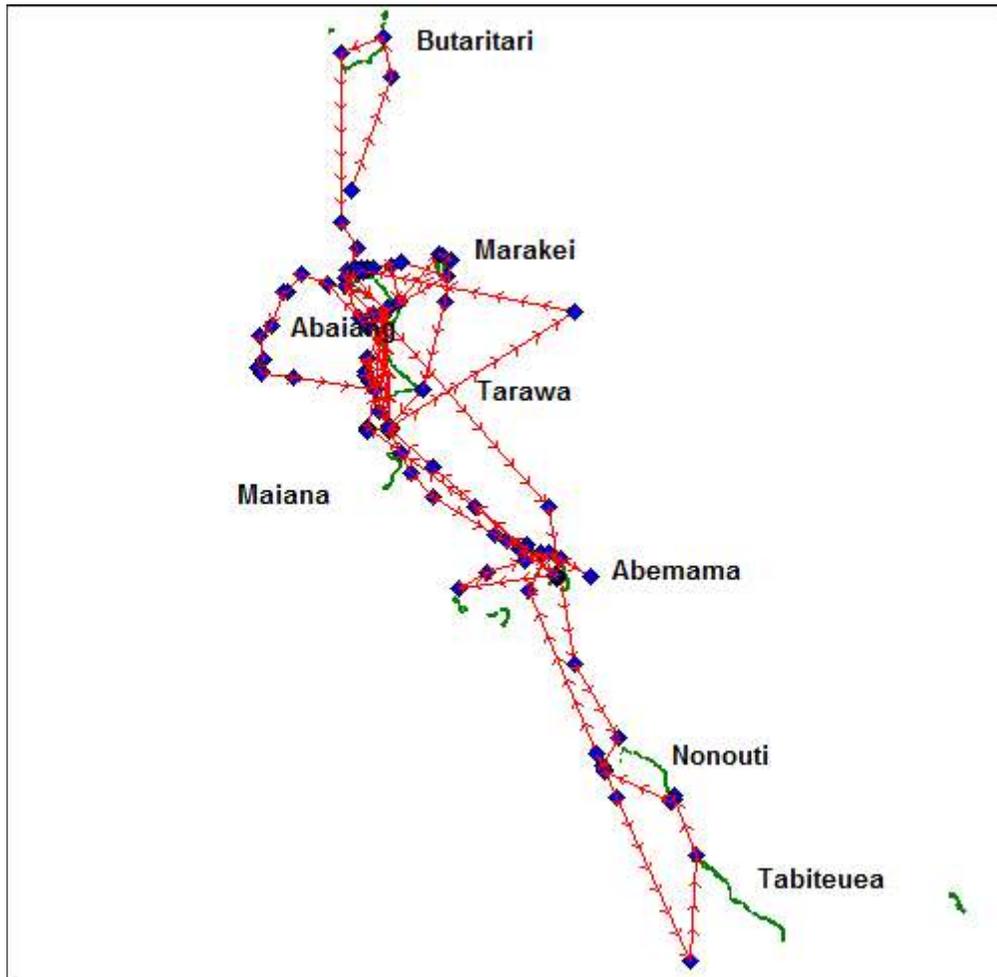


Table 2. Summary of Cruise 4 activity, with number of conventional and archival tag releases per day

Date	Activity	Conventional releases			Archival releases			Total releases
		SJ	YF	BE	SJ	YF	BE	
Apr-24	In port, Customs clearance in Tarawa	-	-	-	-	-	-	-
Apr-25	Searching and fishing from Tarawa to Butaritari	0	0	0	0	0	0	0
Apr-26	S&F from Butaritari to Abaiang	201	172	0	4	1	0	378
Apr-27	S&F around Abaiang	1890	866	1	6	0	0	2763
Apr-28	S&F Abaiang, Marakei and Maiana Bank	191	147	1418	2	0	22	1780
Apr-29	In port, load milkfish, water, provisions	-	-	-	-	-	-	-
Apr-30	S&F from Maiana Bank south to Abemama	1054	13	11	6	2	1	1087
May-01	S&F on W and NW side of Abemama Atoll	658	21	0	2	0	0	681
May-02	Fishing Maiana Bank with handlines and PL gear for larger tuna	0	161	52	0	20	19	252
May-03	S&F W to N side of Abaiang	4051	82	1	0	0	0	4134
May-04	Afternoon fishing Maiana Bank	281	409	3	0	12	0	705
May-05	In port Tarawa, fishing Maiana Bank in evening	1	153	122	0	19	11	306
May-06	S&F around Abaiang Atoll	752	80	2	1	0	0	835
May-07	In port Tarawa, evening fish Maiana Bank	48	184	509	0	0	0	741
May-08	S&F W of Abaiang	1780	162	0	0	0	0	1942
May-09	In port Tarawa for Full Moon Break	-	-	-	-	-	-	-
May-10	In port Tarawa for Full Moon Break	-	-	-	-	-	-	-
May-11	S&F Abemama to Nonouti	72	11	0	0	0	0	83
May-12	S&F Tabiteuea to Nonouti	221	260	431	3			915
May-13	S&F Abemama	1	0	0	0	0	0	1
May-14 th	Afternoon fishing Maiana Bank	32	63	4	0	0	0	99
May-15 th	In port, fuel, water, provisions	-	-	-	-	-	-	-
May-16 th	In port, clear out Tarawa, steam Funafuti	-	-	-	-	-	-	-
May-17 th	Steaming and Fishing	0	0	0	0	0	0	0
May-18 th	Steaming and Fishing	33	0	0	1	0	0	34
	Tag release totals	11266	2784	2554	25	54	53	16736

Figure 2. Distribution of releases by one degree square, by species, showing the Kiribati releases during WP2 Cruise 4, along with all previous project releases

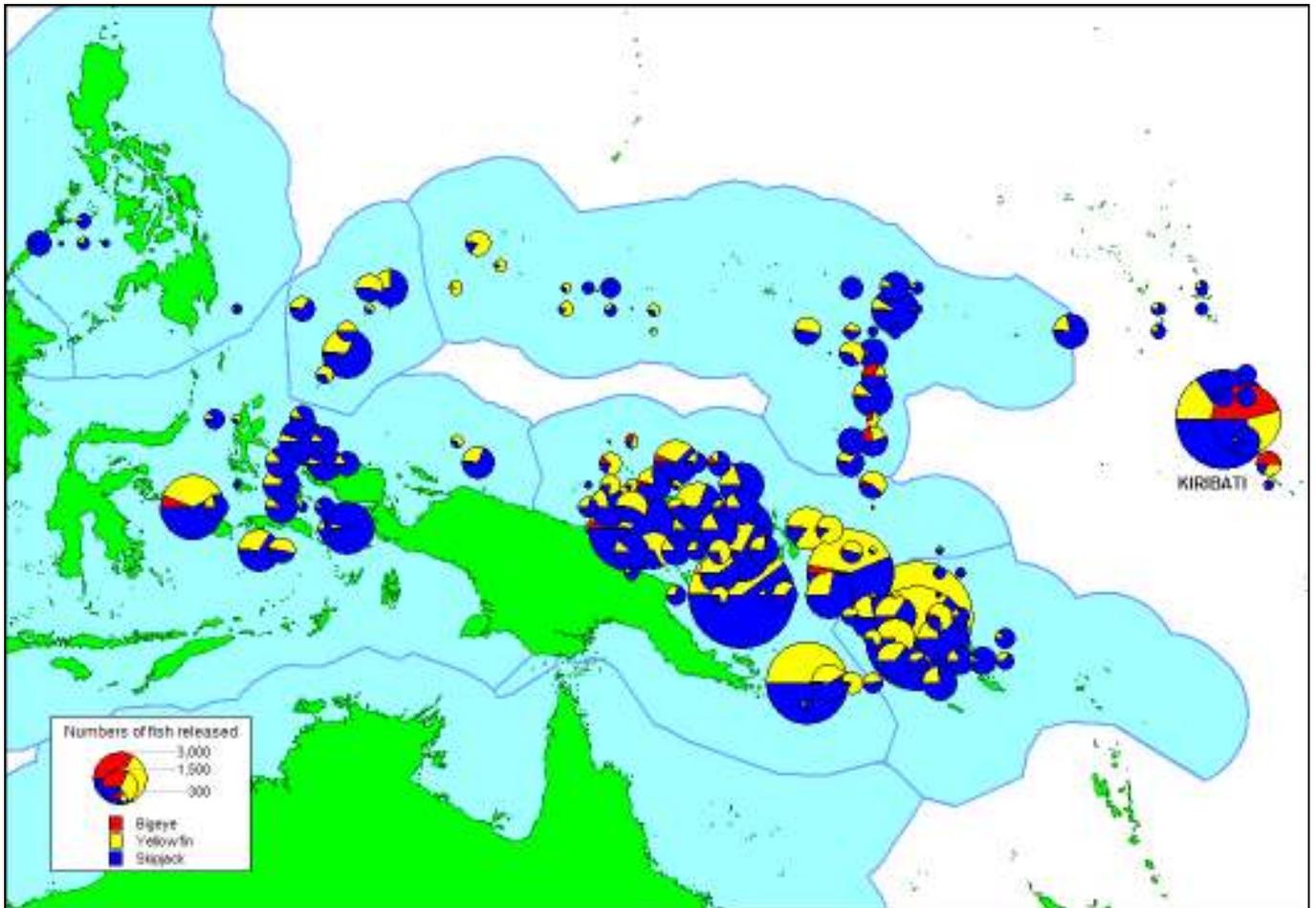


Table 3. Cruise species composition by tag type and date

Nbers of fish - Yellow tags									
Date	B	S	Y	OTH	TOT	B	S	Y	
26-Apr-2009	-	201	172	-	373	-	53.9	46.1	
27-Apr-2009	1	1890	866	-	2757	-	68.6	31.4	
28-Apr-2009	1418	191	147	-	1756	80.8	10.9	8.4	
30-Apr-2009	11	1054	13	-	1078	1.0	97.8	1.2	
01-May-2009	-	658	21	-	679	-	96.9	3.1	
02-May-2009	52	-	161	-	213	24.4	-	75.6	
03-May-2009	1	4051	82	-	4134	-	98.0	2.0	
04-May-2009	3	281	409	-	693	0.4	40.5	59.0	
05-May-2009	122	1	153	-	276	44.2	0.4	55.4	
06-May-2009	2	752	80	-	834	0.2	90.2	9.6	
07-May-2009	509	48	184	-	741	68.7	6.5	24.8	
08-May-2009	-	1780	162	-	1942	-	91.7	8.3	
11-May-2009	-	72	11	-	83	-	86.7	13.3	
12-May-2009	431	221	260	-	912	47.3	24.2	28.5	
13-May-2009	-	1	-	-	1	-	100.0	-	
14-May-2009	4	32	63	-	99	4.0	32.3	63.6	
18-May-2009	-	33	-	-	29	-	100.0	-	
TOTALS	2554	11265	2784	0	16600	15.4	67.8	16.8	
Nbers of fish - Archival Only									
Date	B	S	Y	OTH	TOT	B	S	Y	%
26-Apr-2009	-	4	1	-	5	-	80.0	20.0	
27-Apr-2009	-	6	-	-	6	-	100.0	-	
28-Apr-2009	22	2	-	-	24	91.7	8.3	-	
30-Apr-2009	1	6	2	-	9	11.1	66.7	22.2	
01-May-2009	-	2	-	-	2	-	100.0	-	
02-May-2009	19	-	20	-	39	48.7	-	51.3	
04-May-2009	-	-	12	-	12	-	-	100.0	
05-May-2009	11	-	19	-	30	36.7	-	63.3	
06-May-2009	-	1	-	-	1	-	100.0	-	
12-May-2009	-	3	-	-	3	-	100.0	-	
18-May-2009	-	1	-	-	1	-	100.0	-	
TOTALS	53	25	54	0	132	40.2	18.9	40.9	
OVERALL TOTALS	2607	11291	2838	0	16736	15.6	67.5	17.0	

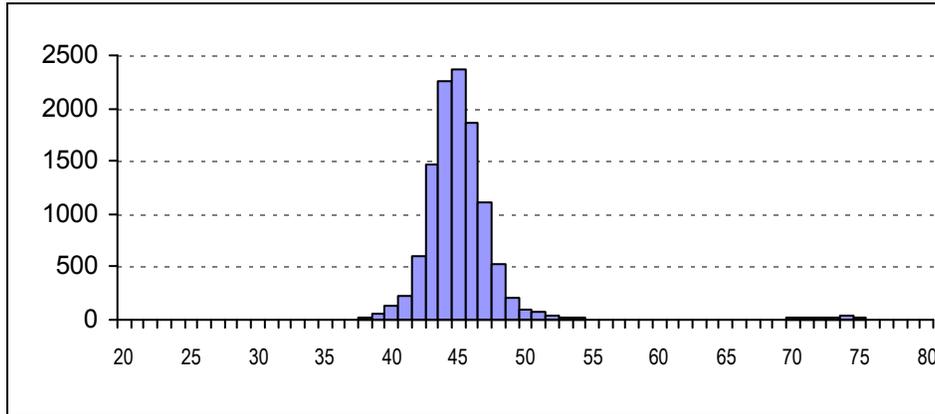
SIZE DISTRIBUTION OF TAGGED FISH

Figure 3 shows the size distribution of fish tagged during cruise 4.

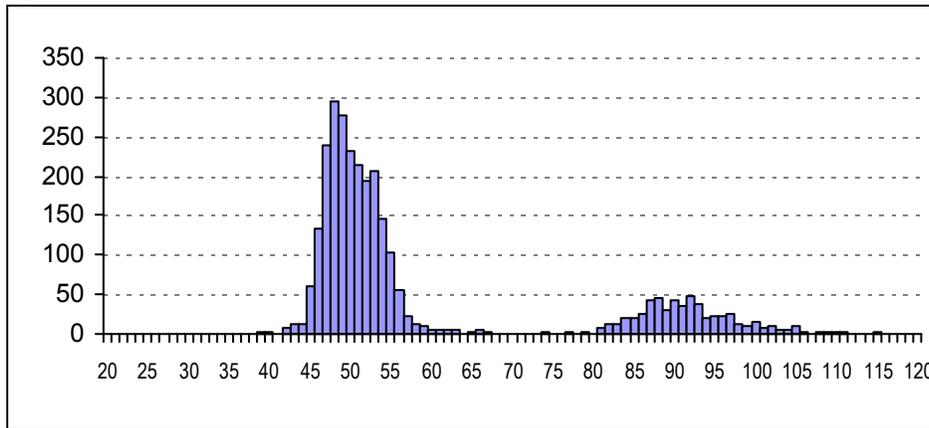
The skipjack show a strong mode at 44-45 cm with few fish above 50 cm. Only 2 schools of larger fish (60-75 cm) were tagged on the 6th and 18th May. LF plots of yellowfin and bigeye tagged exhibit a strong cohort of 2 to 3 year old fish rarely seen on previous PTPP cruises. These fish are all coming from Maiana bank that provided some exceptional evening bites (See Picture1).

Figure 3. Size distribution of fish tagged (all tags) during Cruise 4

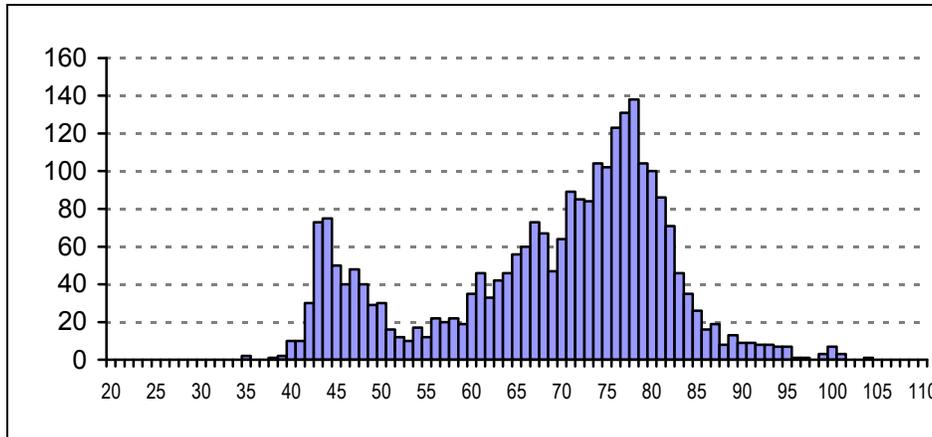
SKIPJACK n = 11291



YELLOWFIN n = 2838



BIGEYE n = 2607



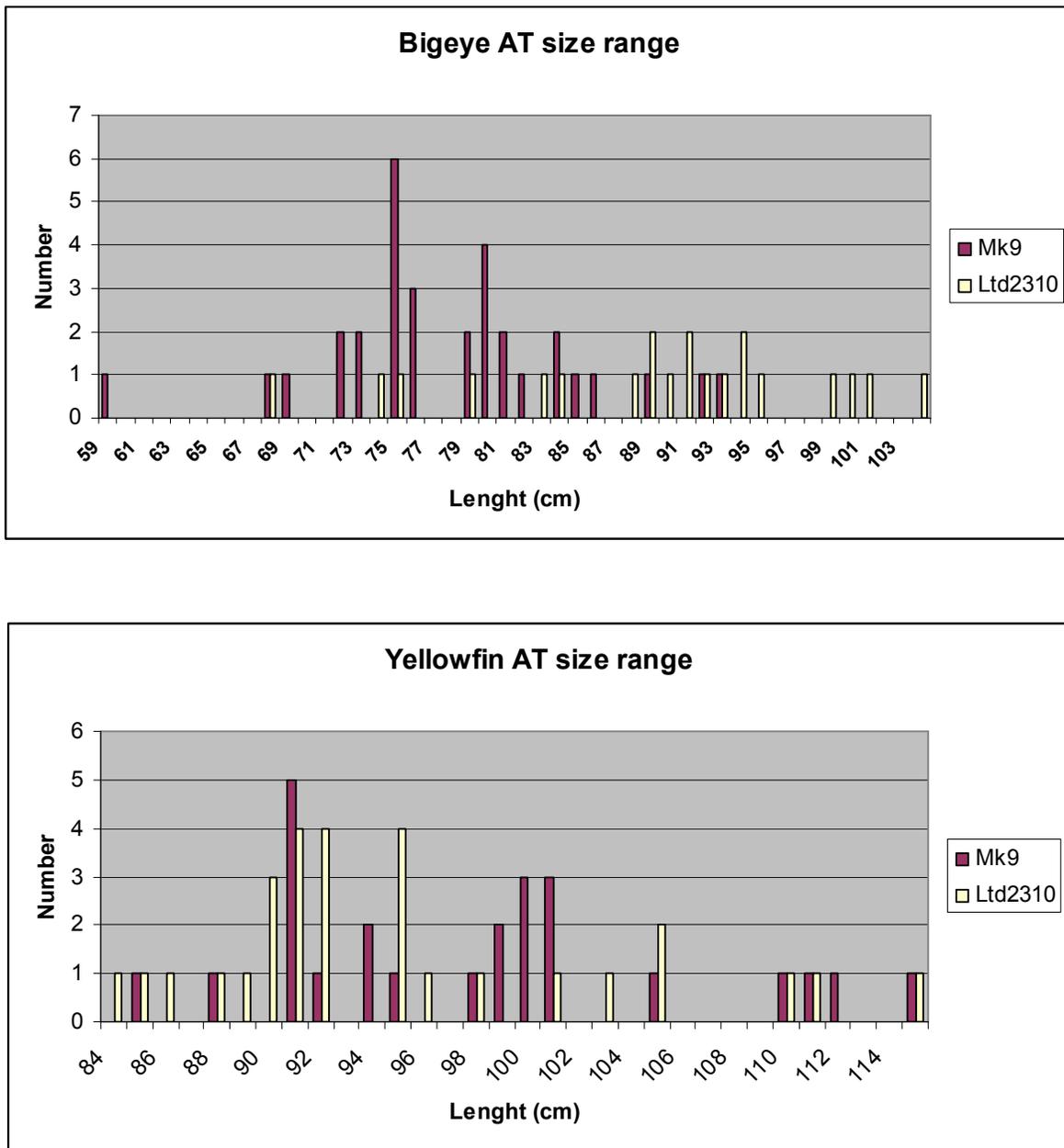
ARCHIVAL TAG SUMMARY

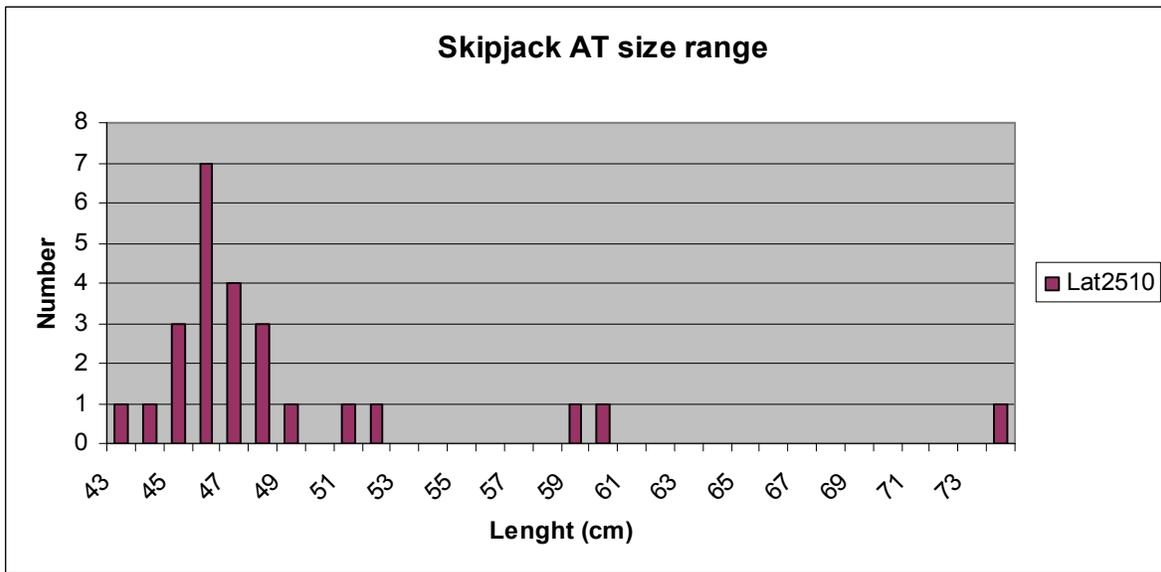
During cruise 4, a large proportion of the bigeye and yellowfin caught on Maiana bank were of suitable size for deploying archival tags such MK9 from Wildlife Computers and LTD2310 from Lotek. (See Picture 2)

This situation allowed deploying 53 bigeye and 54 yellowfin with these archival tags. 25 skipjack were tagged with the small Lat 2510 in schools found closed to the atolls and mostly in the 45-48 cm size range.

The size distribution per species and tag type could be seen on Figure 4.

Figure 4. Size of archival tagged fish per species and tag type





BIOLOGICAL SAMPLING

Biological sampling has been conducted to collect stomachs, muscle and liver samples for trophic studies. A total of 182 fish were sampled during cruise 4 with a good mix of bigeye (50), skipjack (55) and yellowfin (77). They have been collected from free schools (95), island related schools (20) and Maiana bank which can be assimilated to a seamount (67). Bigeye sampled measured between 44 and 99 cm long, skipjack between 43 and 76 cm and yellowfin between 46 and 119 cm. A total of 191 fish were tested for fat content using the fatmeter: 51 bigeye, 63 skipjack and 77 yellowfin. (See Picture 3)

BAITING and MILKFISH PURCHASE

The success of the past tagging experiment (RTTP) in Kiribati-Gilbert Islands mainly depended on availability of cultured milkfish. Previous baitfish surveys in this area have demonstrated that it was difficult to rely on the seasonal nature of the natural bait resources from neighboring atolls to support a viable pole and line fishery. Also most of the baitfish catch made by Te Tautai in Tarawa or Abemama lagoon gave very poor results. During the RTTP, the Te Tautai purchased milkfish from what was then the Temaiku Fishfarm which allowed the vessel to operate as widely as the Phoenix Islands and explore westward to Banaba. For these reasons, contact was established with the Temaiku Eco Farm prior to the arrival of S105 during this cruise. Arrangements were set to purchase at least one full boat load of fingerling milkfish.

Prior to milkfish purchase, the northern atolls were surveyed for suitable wild baitfish stocks. ACIAR baitfish documents were reviewed that indicated that Tarawa, Butaritari and Abaiang had supported the Te Mautari pole and line fleet when it was in operation during the 1980s.

The Te Tautai had made a large haul of oceanic anchovy in the entrance to Tarawa lagoon, but one attempt during the current cruise only produced a few buckets of goldspot herring and unusable bycatch species. Butaritari Atoll was investigated having a large lagoon with adequate depth and easy channel entrance. Four hauls resulted in only 41 buckets of small blue sprat, sardines and scads.

Abaiang Atoll was never surveyed during the RTTP as the chart indicates less than 2 m depth in the channel and it was considered too risky to attempt an entry with the Te Tautai. However, on consultation with the Betio port captain and the Coast Pilot it was judged deep enough for the Soltai 105 to enter. The vessel found 2 – 4 m depth under the keel through the west channel and a good baiting area in 37m. Excellent baiting was found in this location that produced very large hauls of large blue sprat on every visit. It should be noted the highly seasonal nature of this baitfish species and how fortunate the PTTP was in finding large sprats in high abundance during the cruise.

As arrangements had already been made for milkfish purchase, the vessel returned to Tarawa but only took a half load (3 wells) of cultured milkfish. Unfortunately, it was found that the available milkfish were too large to be effective as skipjack chum (mean size of 126 mm, range 97 – 175 mm, and mode 130 mm from 71 fish sampled). However, they proved to be somewhat useful for chumming the larger yellowfin and bigeye found on Maiana Bank and for use as live bait. One well of milkfish was maintained for about one week due to their robust nature and was used for live handline bait on Maiana Atoll.

Abemama Atoll was also investigated as it had produced large quantities of sardine (*Amblygaster sirm*) for the Te Tautai. Baiting attempts during the current WP-2 cruise produced highly variable results ranging from unusable jellyfish mixed with weak herring to one excellent haul of medium sized gold spot herring. Most bait hauls in Abemama were of very large sardine. These baits were far too large for skipjack chum but proved to be useful for chumming the large yellowfin and bigeye located

The success of this cruise mainly relied on the fortunate baiting found in Abaiang Atoll that was visited on 11 occasions and never failed to produce full loads of large blue sprats suitable for medium skipjack to the large yellowfin and bigeye on Maiana Bank. The blue sprats were usually used in one day but were successfully used on a multiple-day excursion south Tabiteua and Nonouti Atolls.

Baiting operations are summarized in Table 4.

A total of 2844 buckets of bait were loaded in 28 hauls for an average of 101 buckets per haul and 178 buckets per night.

Table 4 Summary of bait fishing activity during WP2 Cruise 3

Date	Location	Catch (bkts loaded, hauls)	Species
April 24 th	Tarawa, Betio channel	10 (2)	Hq, mixed reef
April 25 th	Butaritari	41 (4)	Sardines, blue sprat
April 26 th	Abarang	355 (3) 80 released	Blue sprat (large)
April 27 th	Abaiang	186(1)	Blue sprat (large)
April 29 th	Tarawa Abaiang	160 (purchased) 175 (1)150+ released	Milkfish Blue sprat (large)
May 1 st	Abemama	106 (3)	Hq, sardine, blue sprat, atherinids
May 2 nd	Abemama	168 (2) 20 discarded	Sardine (large Amblygaster sp.)
May 3 rd	Abaiang	240 (1)100+ released	Blue sprat (large)
May 4 th	Abaiang	260 (1)80 released	Blue sprat (large)
May 5 th	Abaiang	260 (1) 125 released	Blue sprat (large)
May 6 th	Abaiang	238 (1)	Blue sprat (large)
May 7 th	Abaiang	150 (1)	Blue sprat (large)
May 8 th	Abaiang	181 (1)	Blue sprat (large)
May 10 th	Abaiang	270 (2) 150 released	Blue sprat (large)
May 13 th	Abemama	164 (3) 100+ relea.	Selar c.
May 15 th	Abaiang	240 (1) 80 released	Blue sprat (large)
Total		2844(28)	

TAG RECOVERY

With high number of fish released on a seamount (Maiana Bank) on multiple occasions it is not surprising those Soltai 105 fishermen caught quite a few tagged fish. 49 bigeye, 1 yellowfin and 5 skipjack were recaptured on Maiana B. during 3 different fishing days. Also the large numbers of skipjack released on the free schools north of Abaiang provided 21 recoveries.

During Cruise4, the professional fishermen from Tarawa were starting also to recapture some tagged fish from Maiana Bank. One reward has been provided at the wharf for an Y13 tagged bigeye and 3 fishermen came to MFMRD Bairiki office to claim their reward.

Tag recovery arrangements were set-up at MFMRD office prior to vessel departure on the 15th May with Aketa Taanga becoming local TRO. Kiribati language laminated posters (20) and tag recovery forms were provided to her along with \$500 aud cash acknowledged by MFMRD accountant.

CONCLUSIONS

This cruise in the Kiribati Gilbert Islands EEZ was a great success, in terms of the quantity of fish tagged but also with the relative high percentage of bigeye in the total. The number of bigeye tagged in 18 fishing days represent 81% of those obtained in the previous 15.5 month of Pole&Line boat charter. The number of good sized fish suitable for archival tag deployment was also a great achievement. A special thanks here for the Soltai 105 crew who managed to quickly adapt their fishing skills to pole all those big fish on Maiana bank!

Thanks to the excellent coordination and assistance provided through the Kiribati Permanent Secretary of Fisheries, Ribaanatake Awira, the director of Fisheries Kintoba Tearo and Principal Fisheries Officer Raikaon Tumoia and the rest of the MFRMD staff. Special thanks to Fisheries Officer Waibenua Atema who joined the vessel for most of the trip and Masaru Okamoto of Temaiku Eco Farm for supplying the milkfish, participating in the cruise and providing assistance during every port call.



Picture1: catching bigeye with 3 poles on Maiana Bank



Picture 2: bosom Peter Banga releasing a nice archival tagged bigeye



Picture 3: sampling session with Thomas Usu on Maiana bigeyes

APPENDIX 1

DAILY LOG EXTRACTS

April 24th (Cruise 3)

In port of Tarawa for customs/immigration clearance and check milkfish situation. Public holiday prevented taking care of banking matters. Finally cleared at 10 am. Met at the dock by Kintoba Tearo from MFMRD and introduced to our agent with Central Pacific Producers, Ltd. Masa Okamoto of Temaiku Eco Farms drove CL to the farm in north Tarawa to inspect milkfish situation which appears suitable for one full load of all baitwells. Made arrangements to return next week when wharf was clear to load bait, water and take care of banking. Too late to get to Abaiang for baiting so set up in 35 m outside Tarawa entrance channel where we baited with the Te Tautai at 1 24.5N 17254.4E. First haul 2115; too many barracuda, 9 buckets mixed; second haul at light boat at 1010 for a single scoop of mixed rubbish species. Aborted further attempts and started running north for Butaritari.

April 25th

Very little bait last night in first two hauls so decided to run north from 11pm. Started searching 25 nm south of Butaritari. Searched all around the atoll in counterclockwise direction covering 70 miles. Only two bird schools investigated on east side of atoll but neither considered worth chumming. Entered the southwest passage at 1600 and found 32 - 36 m baiting area north of the pass. First haul at 2330 for 9 buckets of large sardines, blue sprat and scads;

April 26th

In Butaritari lagoon, second baithaul at 0020 in 36 m for 6 buckets of blue sprat; third haul 20 buckets of mixed sprats and weak pilchards, six buckets dumped; fourth haul at 0515 for 6 buckets of blue sprats. Steamed out passage at 0600, searching south all day toward Abaiang. Located nice breezer/splasher of mixed fish just north of Abaiang for 378 releases (173 = 46% YF). Ran in west passage to Abaiang at 1705, shallow but 4 m clearance under hull. First baithaul at location 1 47.540N, 172 59.922E in 37m for 147 buckets of large blue sprat (80mm); second haul at light boat for 53 buckets of large blue sprat.

April 27th

Baiting in Abaiang Atoll; third haul at 0425, 155 buckets of large blue sprat loaded and about 80 buckets released surplus to capacity. Searched clockwise around atoll, finding big area of birds and schools from northeast tip of Abaiang, fishing them eastward for 12 mile stretch. The large blue sprats were just the ticket and fast biting mixed schools resulted in 2763 releases with 31% yellowfin and one bigeye. Six archival tags were put in skipjack as well. Called a halt to fishing around 1700 and ran around the east side of Abaiang to enter the SW pass to bait. Only one baithaul needed in 24 m at 2315 for 186 full buckets of the same large blue sprat loaded at 45 buckets per well for four wells with two wells still holding milkfish.

April 28th

Filled up with sprats last night in one haul in Abaiang and left the baitground at 0400 around the south and east side. Steamed out the channel at 0400 and headed up east side to fishing area of 27/4/09. One blue marlin 207 cm LJFL trolled on red and black Iland Lure at 0645. Second blue marlin 188 cm LJFL trolled at 0841. Searched unsuccessfully in area fished yesterday for big score; turned east and searched around small island of Marakei locating a current line and scattered bird schools on NE side. Not

biting well but 157 SJ and 3 YF tagged there from four schools. Searched south all day arriving at Maiana Bank at 1700 locating small bird school and a few jumpers on large current line set up along the bank ridge. Fast biting bigeye school came up and bit till 1900 when all bait supplies were exhausted with 1440 bigeye tagged, most fish 65-80 cm. Daily total 1780 (193 SJ, 147 YF, 1440 BE) that included 2 SJ and 22 BE archival tags. Ran in to anchor outside Tarawa lagoon for the evening.

April 29th

Ran in from Maiana Bank last night and anchored in outer harbor till daylight. Tied up to Betio wharf by 0640. Picked up SPC checkbook at ANZ Bank of Kiribati in Bairiki and confirmed standing balance at A 99,960 and used checkbook to purchase provisions. Loaded five truckloads of milkfish chum from Temaiku Eco Farm and 16 tonnes of freshwater (four truck deliveries) and topped up crew and SPC provisions at Moel Trading in Betio. Only loaded half load of milkfish as it was generally too large and availability of wild bait at Abaiang has been good. Made contact with Kintoba and Raikaon from Kir Fisheries, supplied them with jpg of English and Kiribati version of tagging poster that Kintoba will see incorporated into a publicity article on the tagging project in the local newspaper. Contacted agent at CPPL and agreed that water and incidentals would be paid by them and we would be billed later. Away from the dock by 1645 headed for Abaiang with Kir Fisheries staff Waibenua onboard. First haul in Abaiang we filled up three empty wells and topped up 3 milkfish wells with 175 buckets of the big blue sprat and let go about the same amount.

April 30th

Pulled anchor at Abaiang and steamed out at 0100 towards Maiana Bank arriving at 0500. About 25 motorized trolling skiffs on the bank waiting for sunrise. Fished skipjack school amongst skiffs for 652 releases including six skipjack archivals. A few larger yellowfin and small bigeye started to come up but several skiffs rushed in and put down the school. One 105 cm YF on live milkfish/spreader bar archival tagged. After 0830 six skiffs started handline jigging with spreader bars (Philippino style) for subsurface bigeye. One 94 cm bigeye taken on diamond jig and archival tagged and another lost at surface. Searched south along east side of Maiana Atoll to Abemama tagging on five more skipjack schools, finishing with 1087 releases, mostly skipjack but with a couple nice archival releases on two yellowfin and one bigeye. In Abemama west pass at 1700 and dropped anchor at 1800. Visited the village and made contact with the fisheries rep Aram Keati who can help inform local fishermen of the tagging project.

May 1st

In Abemama lagoon, first baithaul in 22 m at 0020. Only jellyfish and a few cardinalfish and small *Dussumeria* that were suffocated by the jellyfish. Nothing loaded. Second baithaul at 1315 for 61 buckets of huge sardines, possibly *S. clupeioides*. Third haul at 0445 a surprise 45 buckets of very nice blue sprat and medium Hq and some atherinids. Ran out west pass at daylight searching slot between Abemama and Kuria/Aranuka; south, west, north and back. Found schools north of pass near northwest corner of Abemama that bit well on the one well of Hq and sprats we had for 681 releases, mostly SJ, only 21 yellowfin. In to Abemama for baiting.

May 2nd

First haul in Abemama at 0030 in 21 m; 108 buckets of large sardine loaded, 10 bkts dumped; second haul at light boat at 0130, 160 buckets of large sardine loaded, 10 dumped. Waited till dawn to run out pass and steam for Maiana Bank arriving at 1400.

Set up to handline and jig for bow and stern archivals. Nice school of 85 - 110 cm YF associated with the boat and the bow was able to pole and handline while stern used handline and standup gear for 17 archival releases and a dozen conventional tags. At 1400 started poling on same size yellowfin on two-pole gear. At 1715 the bigeye came up and two pole teams worked till bait ran out at 1820. Total only 252 for the day (71 BE, 181 YF) but all big fish and 19BE and 20YF archivals on useful size tuna. Ran to Abaiang for baiting, anchoring in 24.5m at 2300 hrs.

May 3rd

Back in Abaiang, first and only baithaul at 0430 for 240 buckets to fill five wells and top up milkfish well with at least 100 buckets dumped. Steamed out the pass at daylight and searched north, finding skipjack schools from the northwest to the north corner of Abaiang in basically the same area as fished on April 27. Fast biting schools of 44 cm skipjack (40 - 52 cm) were fished for a new record of 4134 releases (4051 SJ, 82 YF, 1 BE). Seven SJ recaptures were taken that had been released on 27 April. All the sprats finished by 1530, reserving one tank of milkfish for future runs on Maiana Bank. Steamed back to the Abaiang baitground, anchoring in 24.5 m at 1830.

May 4th

First and only bait haul in Abaiang at 0420 for 260 buckets of the large blue sprat to fill up with about 80 released. Waited in lagoon till 0800 and prepped handline gear and modified bow archival cradle for larger fish. Arrived at Maiana Bank at 1300 and started handlining on school of large yellowfin. Fished that for an hour but only 3 ATs with many fish lost or caught not suitable for AT. Different conditions today and large tuna seemed line shy, especially at 1400. Switched to poling at 1600 and fast biting school of medium yellowfin and some skipjack. After 1715 the larger yellowfin started coming up on 2 pole gear and fished it till sunset when the yellowfin stopped. Large bigeye never showed up. Ran back to Abaiang for baiting, arriving at 2330.

May 5th

First and only bait haul in Abaiang in 24.5 m; loaded 260 buckets, released about 125 buckets surplus to capacity. Tied up to Betio wharf at 0900. Bruno and Masa Okamoto (OFCF) boarded vessel and observer Waibenua disembarked. Loaded one truck of water, got rid of rubbish and light provisioning. Cast off at 1300 and arrived at Maiana Bank area at 1515. Found school of large yellowfin and fished for archivals with two-pole and handline/sport pole till 1815 for 54 releases. FM found another school at 1830 of fast biting school of large YF. Bigeye starting coming up around 1845 and were freely mixed with large yellowfin until bait supplies exhausted at 1930. Unfortunate loss of two wells of bait due to overcrowding. Tag total 306 for the day (1 SJ, 172 YF, 133 BE) that included 30 archivals (11 BE, 19 YF). Returned to Abaiang for baiting arriving at 0015 am.

May 6th

One baitshot in Abaiang around 0420; unfortunate that seven big GTs in net thrashing bait that had to be gaffed out (12 - 28kgs or so). Loaded 238 buckets purposefully keeping to only 40 buckets per well. Searched north and eventually circumnavigated Abaiang in a clockwise direction. One mixed school fished in the same area that has held fish in the past at the north corner of the atoll where current lines set up. One skipjack school of very large fish over 70 cm fished between Abaiang and Marakei and one school of small SJ fished on the SE corner of Marakei for a daily total of 835 releases (735 SJ, 80 YF, 2 BE) that included one SJ archival. Returned to Abaiang for baiting, arriving by 1830.

May 7th

One baithaul in Abaiang last night at 01:00 hrs for 150 buckets of sprats to fill the three empty wells and top up the other three. All tanks loaded with 45 bkts. Departed baitground by 0400 to arrive at Betio wharf by 0700. After a farewell talk, dgi and Shelton left the boat at 08:00 in Okamoto-san car for the airport. Appointments arranged with CPP agent for the week end and the 15th (for fuel, provision and clearance). Fisheries arrange for fish donation to hospital, fisheries and some officials...about 2 tons gone in a couple of truck. Loaded 8 tons of water. Valerie arrived at about 12:30 from the airport (transportation by fisheries). Leave the dock at 13:00 sharp for Maiana Banks. Started to chum at 15:30 but fish too shy so decided to wait till 16:30. Found first a small skipjack school. Started catching big yellowfin at 1710; first bigeye show-up at 18:20. Stopped at 1910 with 509 be tagged, still some bait left (not much) but were starting to get too much recaptures (42). Steamed to Abaiang baitground. At anchor at 23:30.

May 8th

First bait net at 04:00 for 181 bkts; enough for the day. Went out Abaiang lagoon at 06:00 and start searching in the SW for 10 nm before turning to the NW. First school found about 12 miles west of North Abaiang for a quick 1005 fish (84 % sj) tagged in 45 min. Then we made a loop going NW, then SW to end-up about 35 NM west of Tarawa pass. Fished 7 schools of pure skipjack, mainly schools of 40 to 45 cm fish with a couple of much bigger fish up to 75 cm. Some recaptures (13) from the 3 May (the big 4000+ day) releases and the 27th April are suggesting that the fish are moving West. Bait was finished at 16:45, only thing that could stop fishing master...Total of the day; 1942 fish, with 1780 S and 162 Y. Arrived at Tarawa harbor at 21:15 but can't go to the wharf as a tanker was downloading some gas/fuel. Dropped the anchor nearby for the night.

May 9th

Got a full load of provision for the crew in the morning at Moel Trading so we will save time on the incoming busy 15th departure day. We've been waiting all day for the ordered 2 trucks of water: they finally arrived at 19:00... Some crew went visiting the island with the local observer who carried them on a large truck. CL and scientist Valerie went outside to visit Tarawa with one of the CPP agent car and end-up hiding in Mary's Motel for the night, far from the howling noise.

May 10th

A bit of a drama in the morning with one of the crew being chased by a local who seemed willing to kill him for some still unclear reason; hopefully the captain managed to hide the crew at the police station before really bad thing happened. Policemen escorted the guy later at the boat. Then the usual stressing time before departure, waiting for some crew who showed-up miraculously at the last minute. Threw the ropes at 15:05 and sailed in Abaiang direction for setting the net before the moon rise. At anchor at 18:25. First set at 0740 for 180 bkts (load 30 in each well and let the rest-100bkts- go). Second set at 20:40 for 90 more bkts (half let go...). Left Abaiang at 21:30 for Abemama.

May 11th

Modified vessel course at 06h to check the Abemama North point. Passed on the west side of the island to be protected from the NE wind and swell. No school sighted apart a couple of large yellowfin. Arrived north Nonouti around 3pm. A few schools started to be chummed on the NW side of Nonouti but first tagged only after 16h for 83 fish. This was

all for the day. Continued to steam in the night to Tabiteuea North point for fishing there in the morning. Arrived near Tabiteuea at 21:30. Stop engine and drift for the night.

May 12th

Start engine at 06:12 after a very quiet night with almost no drift. Start fishing in direction of the north Tabiteuea. Arrived at 0710 at the shallow area (45m) ; 5 local boat there; give posters to one of them. Many fish at echo sounder , birds everywhere but also plenty bait in the water made the fish not hungry and can't keep them at the chum. Left the area after 168 fish tagged (included 3 SJ AT) and steam SW for 1 hour before turning North back to Nonouti. Found a few island ass schools on the SE corner of Nonouti but many Kaw and RR mixed. Try to go inside the lagoon at 15h but can't see any of the beacons signaled on the chart...impossible to go in. Decided to carry on fishing going north. About one hour later, under the rain, start chumming a small school with very few birds. Bigeye started to be pulled 5 min later and this last for about 30 min and about 2 tanks of bait. A very usefull school with 431 B (63%), 192 Y and 66 S! We then started to steam to Abemama, about 70 nm away.Total for the day at 915 fish tagged for 224 S (included 3AT) , 260 Y and 431 B.

May 13th

Arrived closed to Abemama at 00:15 am, stopped the engine and drift . Started fishing at 0645 and turn clockwise around Abemama in 15knts wind. A couple of schools chummed on the north point but only Kaw. Then we searched along the west coast. Found a large foaming school 8nm from the WNW south point but again almost pure kaw feeding on some bait balls. Bait exausted, we steamed to Abemama entrance; at anchor at baitground at 14:30. Went ashore to see fisheries local assistant Aram but he was out fishing; gave a basket of fish for his family and made a small visit with Aram's wife as guide. Back to the boat at 17:30. First bait set at 21:00. for 160 bkts of Selar c. loaded in 4 tanks. Kept 2 tanks for second set on light boat if we could get something smaller...But just got 4 bkts of mixed species (Hq, blue sprat, sardine, reef fish...). 3rd set scheduled at 4h.

May 14th

Third set at 4:10 in very bright moon for nothing but jelly fish...stay at anchor till 8h. Left Abemma to Maiana bank. ETA 16h. No fishing on the way as most bait unsuitable for sj. Arrived at the bank summit at about 1545 but no bird activity. Found a school about 8 nm ENE of the summit. Tagged 95 fish with the small bait we had but after these one exausted we couldn't keep the fish (mixed of S, Y, B around 45 cm) at the boat with the akules. Found another school with big yellowfin but tagged only 4 fish as these were too big to pole even with 3 poles together. Total for the day: 99 tagged (32 S, 63 Y and 4 B). Start steaming toward Tarawa at 18h. At the dock at 21h.

May 15th

Everything went smoothly in the morning. Setting the fuel and water delivery, paying the fuel bill at Koil with the ANZ bank of Kir cheque book, getting cash at the same bank. Went also to the fisheries office and set-up tag recovery procedures with Aketa. Gave her 500 aud in cash for tag reward payment. Came back to the boat at mid day. Fuel and water delivery (30 tons each) finish at 2:30. Ready for immigration ordered at 15h with the agent. But then crews were missing, captain, FM and chief included. Immigration came but most people still missing...Seems a big party was going on at the nearby Seaman bar with the observer Waibenua leadering. Started raining dogs and

cats but after many attempts we managed to get everybody back (people were coming back and leaving again) . Then immigration people (very patient...) said they missed the Custom officer and when this one show-up he finally said the custom clearance paper was with the agent...Then it was more than 18h, immigrations said it was too late (they had enough I think) , sorry, see you tomorrow.....

One of the lady working at CPP said something I didn't understand about the clearance paper but promised we could get clearance at 7am tomorrow....Sailing to Abaiang to get bait at 18:35. At anchor at 2150.

May 16th

First set in Abaiang at 02:30 for 240 bkts in quite moon bright conditions. Steam back to Tarawa at 0330. At the dock at 0645. Saw the CPP lady who said immigration and customs were on their way. Wait until 7:30. After the usual ceremonial of papers, we through the ropes at 0815 with great relief for some... Funafuti 700 nm away now...

May 17th

Steaming & Fishing all day but only met big YF schools; big mortality occurred in the bait tanks, probably due to a lack of surveillance.

May 18th

Passed by the Seamount 0441S/17636E at 0600, a bit early to see something...meet a nice school of big skipjack (58-65) at 0845 but we run out of bait very quickly after 34 fish tagged, including one archival. We could only steam by now... Passed nearby Niutao at about 1730. Many birds and fish school around. We might come back there later...