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PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS

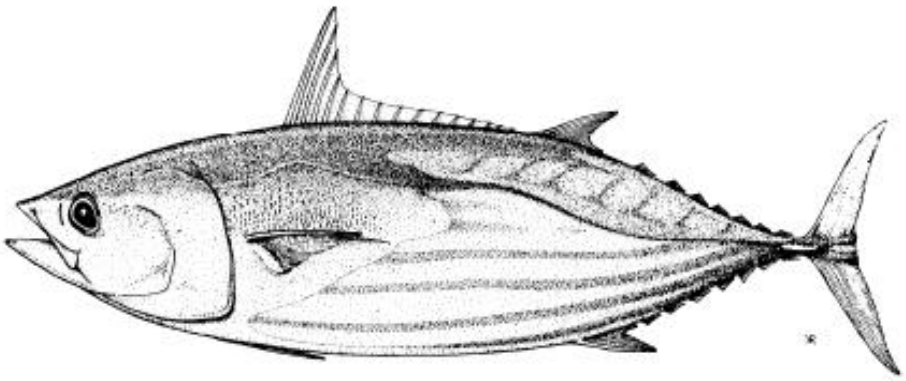
WCPFC-SC6-AR/CCM-17

PALAU

TUNA FISHERIES IN THE WATERS

OF THE

REPUBLIC OF PALAU_2010



TUNA FISHERIES

1. Fleet Structure

Tuna fishing in the Palau Exclusive Economic Zone is dominated by the offshore based longline and purse seine fleet of Japan and the locally based longline fleet of Chinese Taipei. Table 1 shows the break-down of vessels licensed to fish in Palau's EEZ by gear. Still, Chinese Taipei fleet has been the dominant one. Up to 100 vessels have operated within the EEZ in any one year, with the number of vessels fluctuating between 42 and 87 vessels since 2005 (Table 1).

Table1. Shows the breakdown of domestic based foreign based and off-shore based vessels licensed to fish in Palau water over the last five years. Chinese-Taipei fleet is still the dominant fleet over the years.

	Longliner									TOTAL	Pole & Line	Purse Seine
Year	BZ	CN	FM	ID	JP	KI	TO	TW	VN		Japan	
2006		3	2	6	25			168		234	1	29
2007				6	37			143		214		28
2008	1				28			104		166		22
2008					38		2	71		129	6	18
2010					38		2	71		129	0	18

1.1 Longline Effort

Most longline effort and catch are focused on the central-eastern area of Palau's EEZ. Chinese Taipei fleet operates mainly in the central eastern area year round rather to the recent operation of the Japanese Fleet.

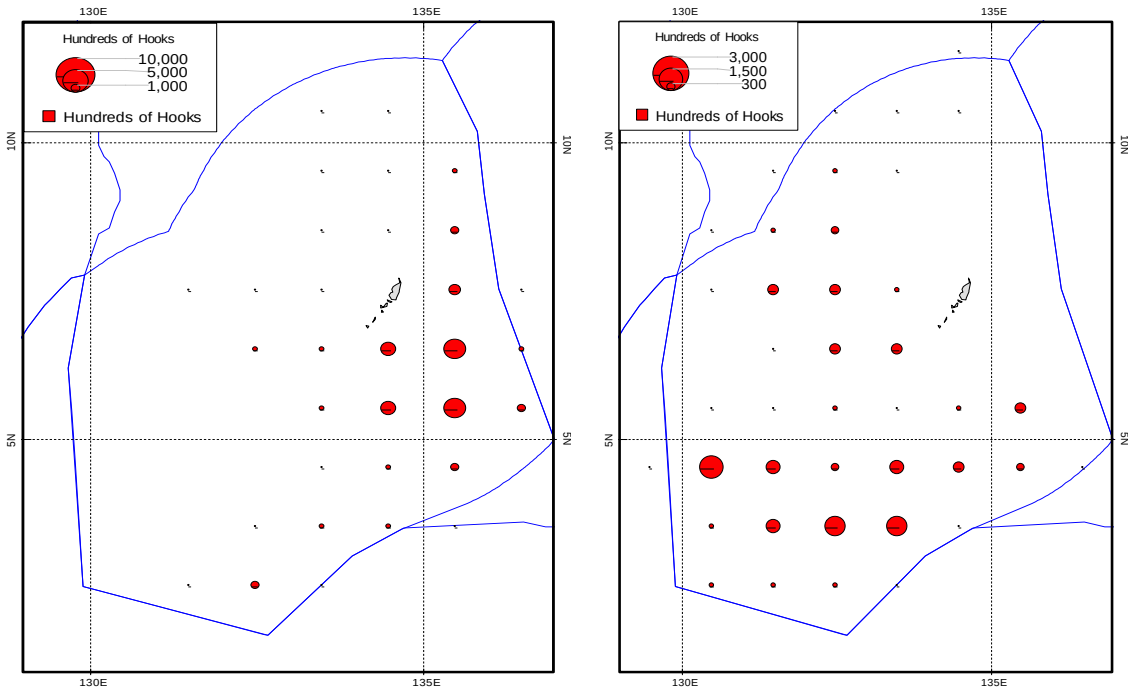


Figure1. Distribution of longline fleet effort for Chinese Taipei (left) and Japanese (right) in Palau water, year 2009

1.2 Purse Seine Effort

Most purse-seine fishing in the Palau EEZ, has been and is still reported from the areas south 4°N, the extreme south of the EEZ (Figure 2). The area of highest purse-seine effort does not overlap the areas of highest longline effort (east of Koror, Figure 1); suggesting the spatial interaction between the longline and purse-seine fleets is relatively low. Japan has been the dominant purse-seine fleet operating in the Palau EEZ, with the fleet of the United States and vessels operating under the FSM Arrangement.

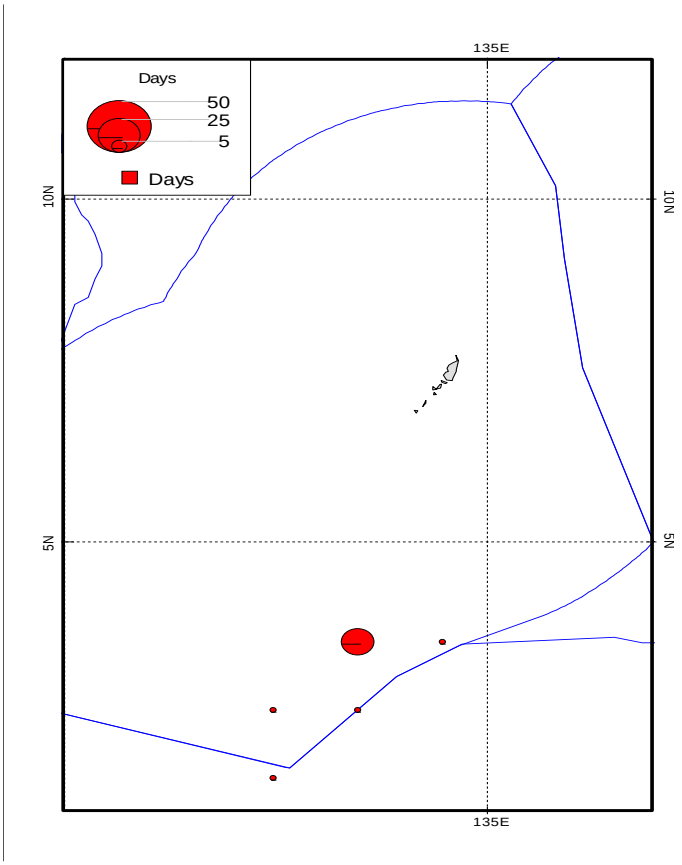


Figure2. Distribution of purse seine effort by days in the Palau EEZ (2009)

1.3 Catches

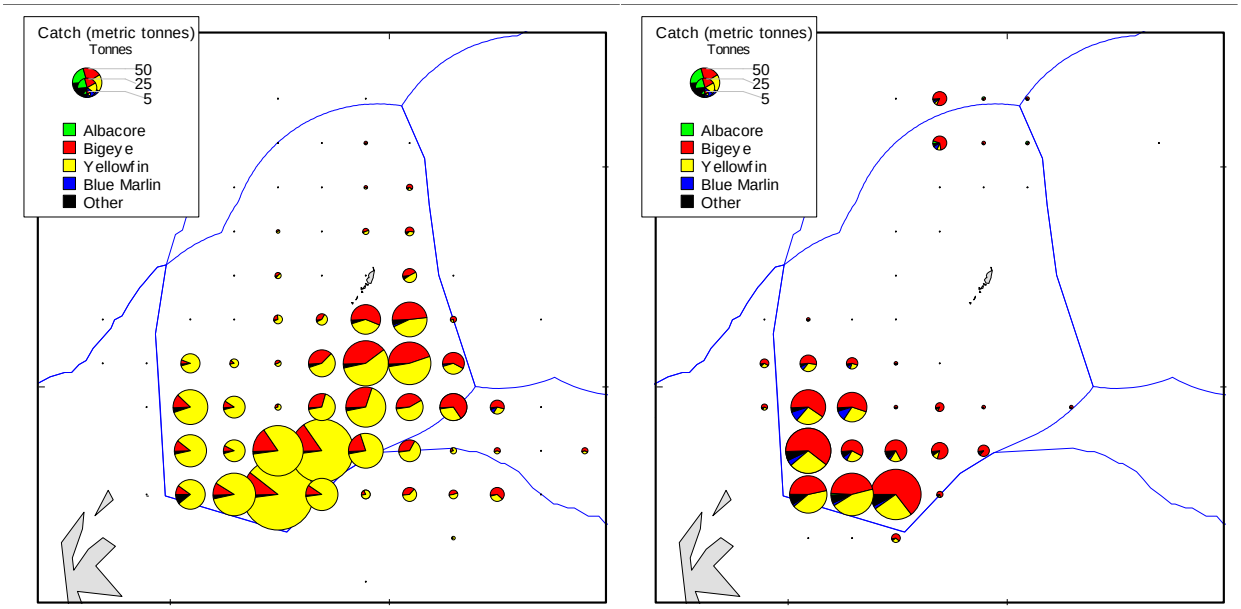


Figure2. Distribution of Chinese Taipei (left) and Japan (right)) longline catch by species for 2010

Table 1. Estimates of the catch by species for locally based foreign longline fleet in Palau waters, 2006-2010.

		Catch (metric tonnes)				
Flag	**Year**	**ALB**	**BET**	**YFT**	**OTH**	**TOTAL**
JP	2006	9	626	200	0	835
JP	2007	16	518	451	0	985
JP	2008	48	1,406	268	0	1,722
JP	2009	0	482	107	0	590
JP	2010	4	407	209	0	620
TW	2006	78	2,139	1,322	0	3,539
TW	2007	53	1,107	1,203	0	2,363
TW	2008	60	1,290	593	0	1,943
TW	2009	5	352	224	0	581
TW	2010	3	394	1,206	0	1,603
TOTAL	2006	87	2,766	1,521	0	4,375
TOTAL	2007	69	1,624	1,655	0	3,348
TOTAL	2008	108	2,695	862	0	3,665
TOTAL	2009	5	834	331	0	1,171
TOTAL	2010	7	801	1,415	0	2,223

Total catch (Table 2) in 2006 almost reached 7,000mt, and stayed at 5,000mt for the next two consecutive years. Bigeye tuna has been the dominant species and exceeded 2,000mt in 2006 and

2008 with significant but lesser amounts of yellowfin. Yellowfin catch experienced a significant low in 2009 catch as compared to 2007 which exceeded 2006 but still much lower than the high catch estimated in the late 1970's (3000mt).

Table2. Estimates of catch by species for all longline fleet, 2005-2009, in Palau water (Source: Best estimates of logsheet and unloading data; 2009 data are provisional)

			Catch (metric tonnes)							
Year	Boats	Trips	Bigeye	Yellowfin	Black Marlin	Blue Marlin	Striped Marlin	Sword-fish	Other	Total
2005	137	1240	1429	1289	5	61	3	19	3	4185
2006	190	1764	3018	1583	13	91	1	95	2	6758
2007	161	1450	1642	1658	6	60	1	100	7	5085
2008	116	1145	2732	870	6	160	1	103	4	5136
2009	87	343	775	294	1	17	0	55	0	1571

Chinese Taipei and Japanese fleets for the most part target bigeye and the proportion of bigeye in catches by Chinese Taipei longline fleet has increased since 2005 with the most high in 2006 for the last five years (Table 3). As for the Japanese fleet operating off-shore, high catches, 1406mt, was seen in 2008 during the five years period (Table 4).

Table3. Estimates of catch by species for the Chinese Taipei longline fleet, 2005-2009 in Palau water (Source: Best estimate of logsheet and unloading data; 2009 data are provisional)

			Catch (metric tonnes)							
Year	Boat	Trips	Bigeye	Yellowfin	Black Marlin	Blue Marlin	Striped Marlin	Sword-fish	Other	Total
2005	117	997	1217	1208	2	43	0	5	1	2475
2006	138	1444	2139	1322	2	27	0	8	2	3500
2007	127	1294	1106	1203	0	7	0	9	6	2333
2008	79	930	1286	592	0	5	0	9	4	1896
2009	57	290	340	213	0	2	0	21	0	577

Table 4. Estimates of catch by species for the Japanese off-shore longline fleet, 2005-2009 in Palau water (Source: Best estimate of logsheet and unloading data; 2009 data are provisional)

			Catch (Metric tonnes)							
Year	Boats	Trips	Bigeye	Yellowfin	Black Marlin	Blue Marlin	Striped Marlin	Sword-fish	Other	Total
2005	2	11	46	24	0	3	1	3	0	77
2006	26	98	626	200	2	38	0	72	0	939
2007	29	133	518	451	5	51	1	90	1	1118
2008	33	190	1406	268	2	155	1	93	1	1925
2009	30	53	435	80	0	14	0	34	0	565

Skipjack tuna dominate the catches of the purse-seine fleet operating in the Palau EEZ in most years. Yellowfin tuna have also contributed a high proportion of total purse-seine catches in many years, typically contributing more than 30% of total catches by weight. Bigeye catches estimated

from logsheets have been insignificant. However, due to the difficulties in identification of small bigeye and yellowfin, it is likely that logsheet catches of bigeye significantly under-estimate the actual catches of bigeye from the Palau EEZ.

Table5. Estimates of catch by species for the Japanese off-shore purse seine fleet, 2005-2009 in Palau water (Source: Best estimate of logsheet and unloading data; 2009 data are provisional)

				Catch (metric tonnes)				
Year	Boats	Days	Sets	Bigeye	Skipjack	Yellowfin	Other	Total
2005	7	63	33	1	1128	857	29	2015
2006	6	111	88	0	2912	1164	26	4102
2007	4	33	15	0	264	179	2	445
2008	7	84	84	0	2377	936	7	3320
2009	5	22	17	0	473	212	0	685

1.4 Catch Rates

The CPUE for Japan fleet has been gradually increasing after dropping in 2004 while Chinese Taipei fleet has been stable ever since its high in the 1990 (Figure 3). *Bigeye CPUE's for both fleet has been increasing during the five year period while yellowfin has been decreasing in some years (Figure 4).*

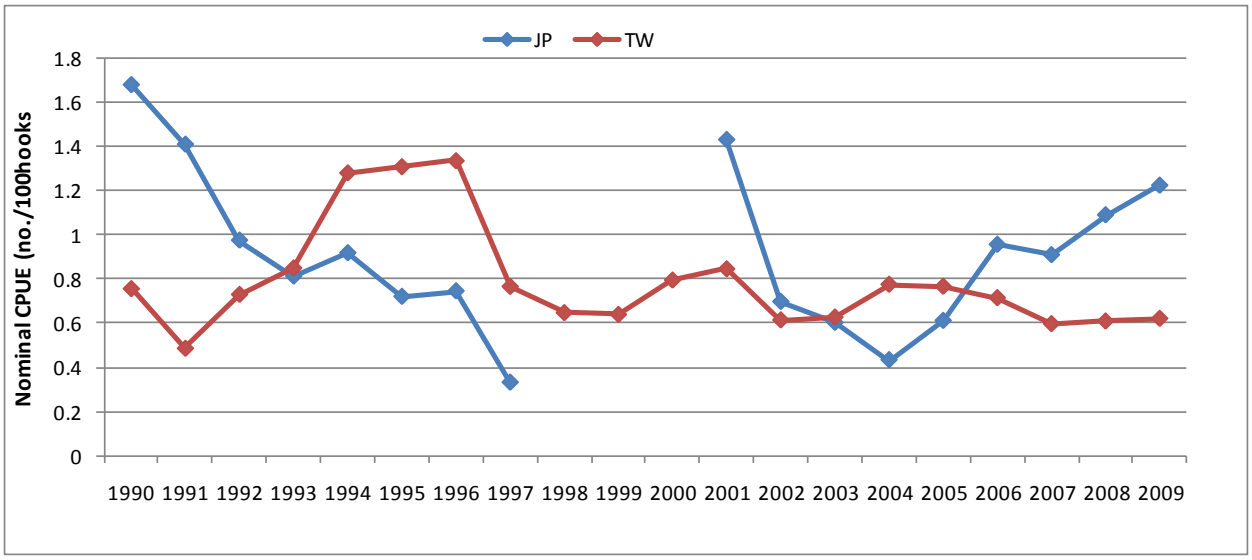


Figure3. Annual trends in nominal CPUE (number per hundred 100 hooks) for longline fleets operating in the Palau EEZ, 1990-2009

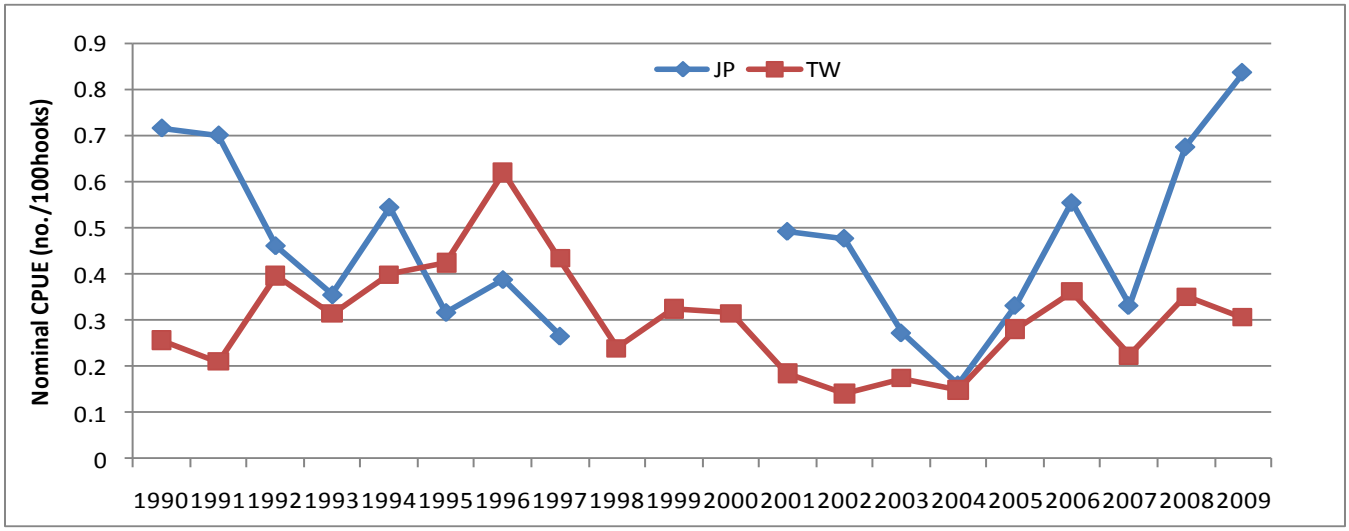


Figure4. Annual trends in bigeye nominal CPUE (number per hundred 100 hooks) for longline fleets operating in the Palau EEZ, 1990-2009

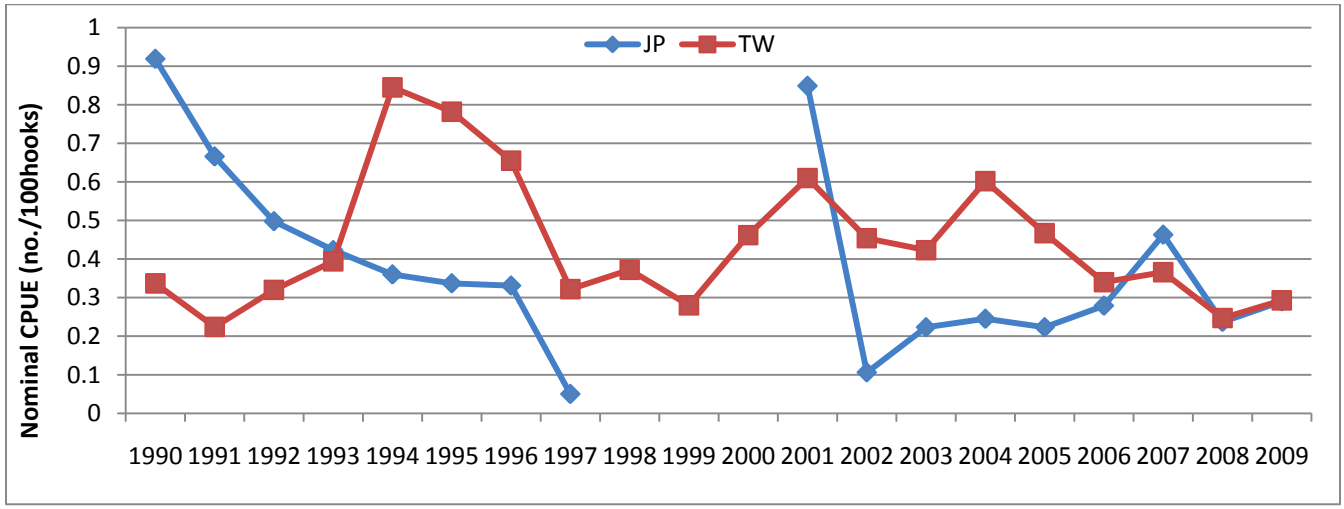


Figure5. Annual trends in yellowfin nominal CPUE (number per hundred 100 hooks) for longline fleets operating in the Palau EEZ, 1990-2009

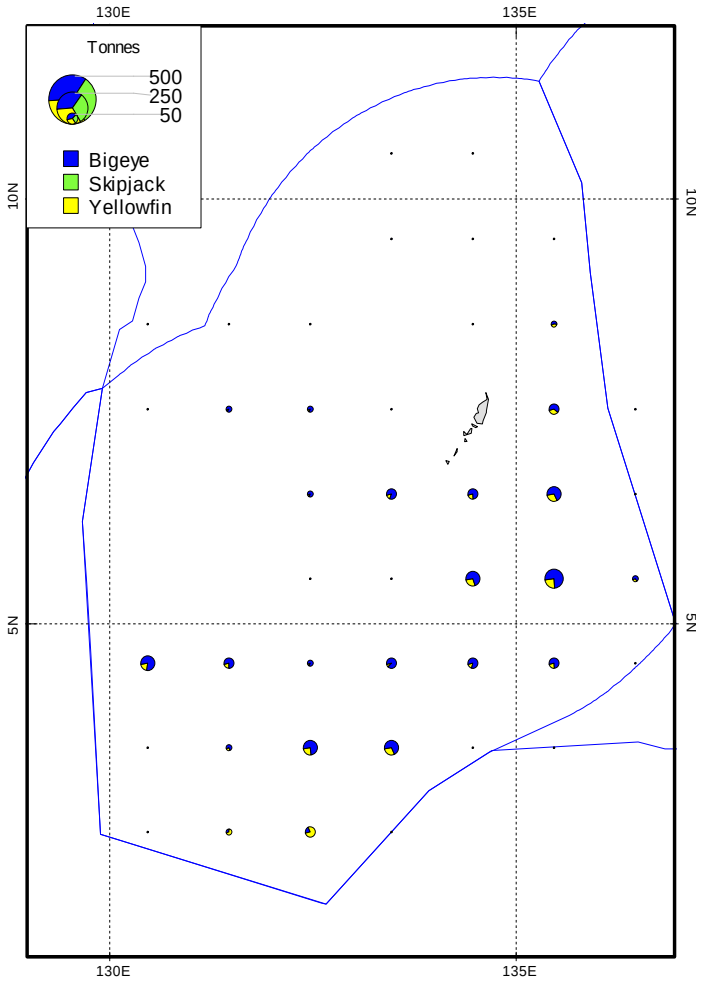


Figure6. Distribution of longline catch (metric tones) by species in the Palau EEZ (2009) (Blue-Bigeye; Green-Skipjack; Yellow-Yellowfin)

2. Size of fish

Even though, limited observer data are available for Palau, extensive port sampling program continues and have produced a large amount of data for the major species captured in Palau EEZ (Figure 7)

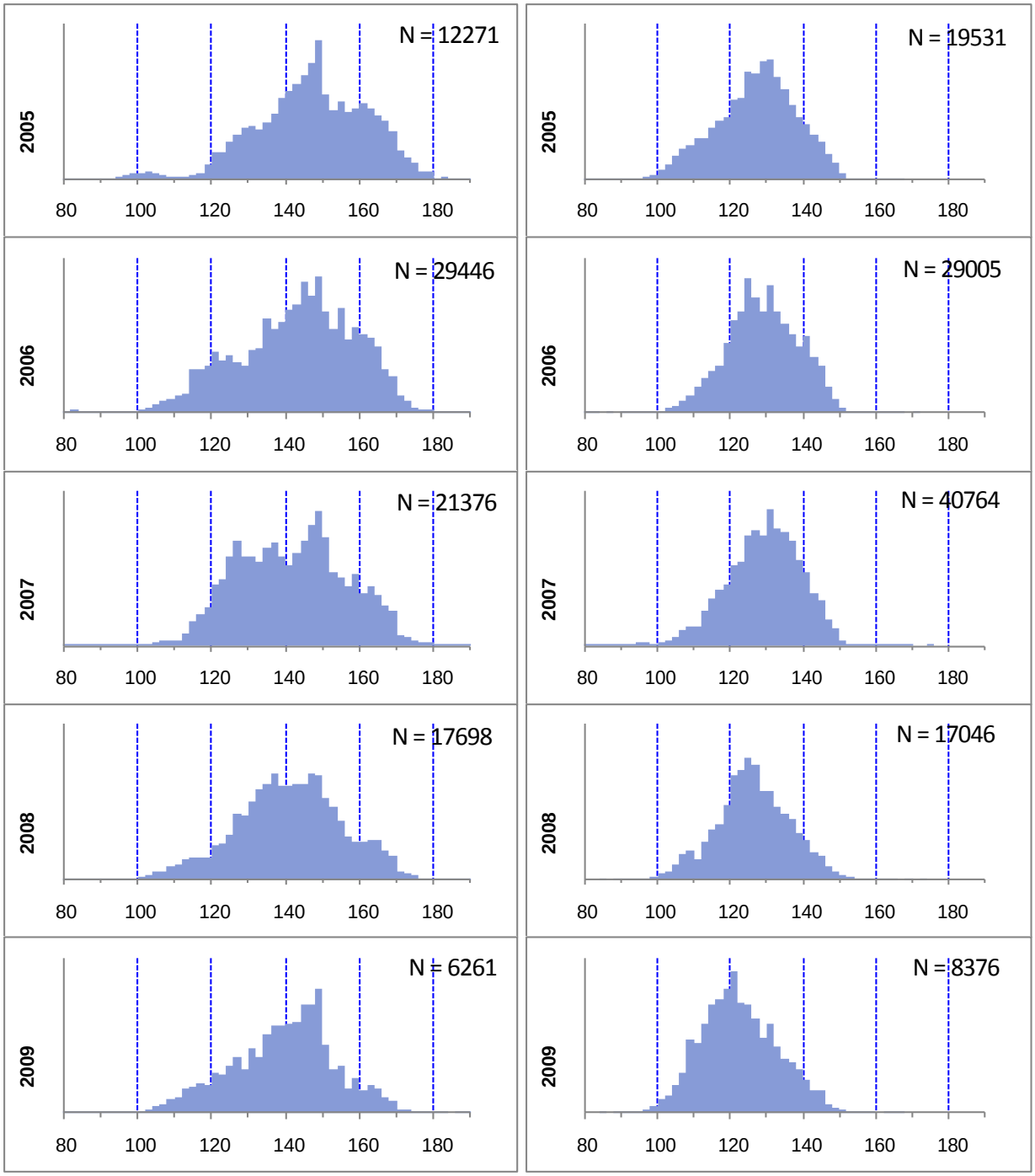


Figure7 Annual length-frequency distributions of yellowfin (left) and bigeye (right) captured by longline-method fisheries in the Palau EEZ, 2005-2009. (Source, size frequency data held by SPC. Lengths measured as fork lengths (FL). n,denotes the total number of fish measured for each year

3 Longline – Species Catch Composition summary

Table6 Longline – Species Catch Composition summary

Tuna Target

		Species Composition		
		2007	2008	2009
Category	**Species**	**%**	**%**	**%**
Target Tuna	Albacore	0.0000%	0.0000%	0.1823%
	Yellowfin	40.0385%	20.2406%	19.3486%
	Bigeye	21.1580%	35.3526%	28.4759%
Billfish	Blue marlin	4.0398%	11.2060%	8.4711%
	Black marlin	3.1369%	3.5473%	0.8872%
	Striped marlin	1.3621%	3.0811%	5.8945%
	Swordfish	7.6670%	5.9926%	4.9344%
	Other Billfish	2.0106%	1.2846%	1.1060%
Sharks and Rays	Blue shark	3.9002%	1.7867%	5.2139%
	Mako sharks	1.1170%	1.5943%	2.1877%
	Oceanic whitetip shark	0.1551%	0.3260%	0.0000%
	Silky shark	5.6068%	7.8022%	9.2003%
	Other sharks and rays	4.9707%	6.3154%	6.9762%
Other finfish	Bullet/Frigate tunas	0.0000%	0.0000%	0.0000%
	Kawakawa	0.0000%	0.0065%	0.0000%
	Rainbow Runner	0.0248%	0.0000%	0.0000%
	Wahoo	0.0869%	0.0652%	0.6806%
	Common dolphinfish	0.2327%	0.2152%	1.6286%
	Triggerfish	0.0000%	0.0000%	0.0000%
	Barracudas	0.8253%	0.2641%	0.9237%
	Escolars	0.8222%	0.4532%	3.2815%
	Lanctfishes	0.0807%	0.0098%	0.0122%
	Ocean sunfish	1.5266%	0.0000%	0.0000%
	Oilfish	0.1334%	0.0946%	0.0851%
	Opah	0.0000%	0.0000%	0.0000%
	Pomfrets	0.0062%	0.0391%	0.0000%
	Small baitfish	0.0000%	0.0000%	0.0000%
	Other fish	1.0984%	0.3228%	0.5105%

Tuna	61.1964%	55.5932%	48.0068%
Billfish	18.2165%	25.1117%	21.2931%
Sharks and rays	15.7498%	17.8247%	23.5780%
Other finfish	4.8373%	1.4704%	7.1220%
Total non-target	38.8036%	44.4068%	51.9932%
Billfish (non-Swordfish)	10.5495%	19.1190%	16.3588%

4 Longline – Species Catch Estimate Summary

Table7 Longline – Species Catch Estimate summary

Total Tuna Catch Estimate		
2007	2008	2009
3,363	4,490	1,358

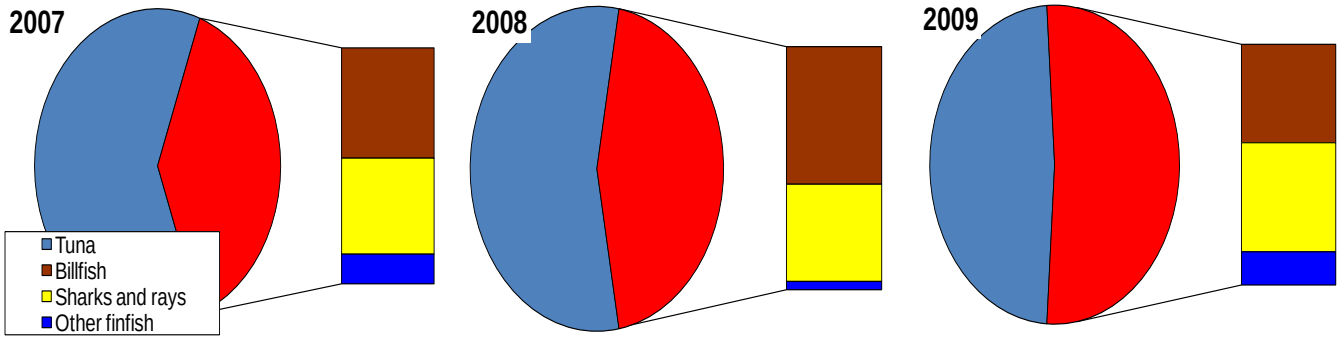
2007: 12 trips 2008: 13 trips 2009: 7 trips

Catch estimates (MT)

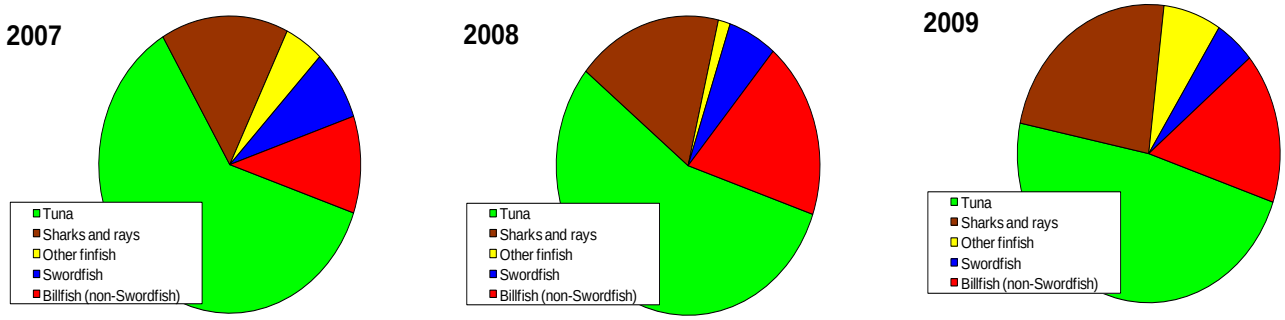
		2007	2008	2009
Category	**Species**	**MT**	**MT**	**MT**
Target Tuna	Albacore	0	0	5
	Yellowfin	2,200	1,635	547
	Bigeye	1,163	2,855	806
Billfish	Blue marlin	222.0	905.1	239.6
	Black marlin	172.4	286.5	25.1
	Striped marlin	74.9	248.8	166.7
	Swordfish	421.3	484.0	139.6
	Other Billfish	110.5	103.8	31.3
Sharks and Rays	Blue shark	214.3	144.3	147.5
	Mako sharks	61.4	128.8	61.9
	Oceanic whitetip shark	8.5	26.3	0.0
	Silky shark	308.1	630.1	260.3
	Other sharks and rays	273.2	510.1	197.3
Other finfish	Bullet/Frigate tunas	0.0	0.0	0.0
	Kawakawa	0.0	0.5	0.0
	Rainbow Runner	1.4	0.0	0.0
	Wahoo	4.8	5.3	19.3
	Common dolphinfish	12.8	17.4	46.1
	Triggerfish	0.0	0.0	0.0
	Barracudas	45.4	21.3	26.1
	Escolars	45.2	36.6	92.8
	Lanctfishes	4.4	0.8	0.3
	Ocean sunfish	83.9	0.0	0.0
	Oilfish	7.3	7.6	2.4
	Opah	0.0	0.0	0.0
	Pomfrets	0.3	3.2	0.0
	Small baitfish	0.0	0.0	0.0
	Other fish	60.4	26.1	14.4

Total Target tuna	3,363	4,490	1,358
Total billfish	1,001	2,028	602
Total sharks and rays	866	1,440	667
Total finfish	266	119	201
Total non-target	2,132	3,587	1,471
	38.8036%	44.4068%	51.9932%

TUNA



Swordfish



5. Research and Statistics

Oceanic Fisheries, Bureau of Marine Resources, continues to monitor tuna fisheries activities in Palau Exclusive Economic Zone. Oceanic Fisheries active port samplers, on a mandatory basis, continue to monitor and sample all catch landed respectively by the two major longline fleet, Japan and Chinese Taipei. At the moment, only three (1-contract; 2-permanent) observers are utilized and frequently observes and collect fisheries data at the same time assist port samplers.

Because of the status of the stocks especially bigeye tuna, port samples and observers had a workshop conducted by the Oceanic Fisheries Program_Secretariat of the Pacific Community (OFP_SPC) on the 16th to the 20th of November in extracting otoliths to study the reproductive biology of both bigeye and yellowfin tuna. A letter, from the Ministry of Natural Resources, Environment and Tourism, was sent to all fishing companies on the significant of the work and at the moment is going on.