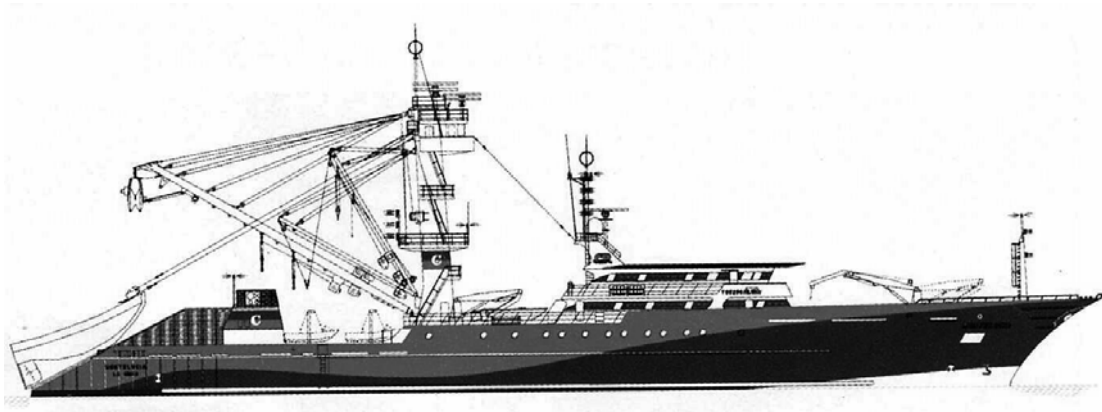




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NOTES ON THE USE OF FADS IN THE PNG PURSE SEINE FISHERY



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July 2003

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**NOTES ON THE USE OF FADs
IN THE PAPUA NEW GUINEA PURSE SEINE FISHERY**

(A paper prepared for the Fishing Technology Working Group,
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The PNG purse seine fishery

The purse seine fishery in the EEZ of PNG is one of the largest and most diverse in the region, regularly contributing over 20% of the annual regional purse seine catch. Annual catches for the last five years are listed below (Table 1) and have averaged around 180,00t. Much of the catch is taken in FAD and other associated sets.

Table 1. Purse seine catch in the PNG EEZ, 1998-2002 (Source: NFA data)

Year	1998	1999	2000	2001	2002	Hist. high
Catch	175,593	124,855	280,444	160,710	166,356	368,763 (1991)

The breakdown of sets made in the fishery in recent years is listed in Figure 1 and Table 2 and shows the high proportion of associated sets (anchored FAD, drifting FAD and log sets - 64% overall) relative to other EEZs. This is due to the combination of the high incidence of floating logs in the PNG area and since 1997, increased deployment of anchored FADs by domestic fleets. The use of drifting FADs has been limited, and seems to have declined since since 2000. The percentage of unassociated (free) and bait schools generally increases during La Nina years such as 2000, when the abundance of tuna forage and tuna schools both increase markedly.

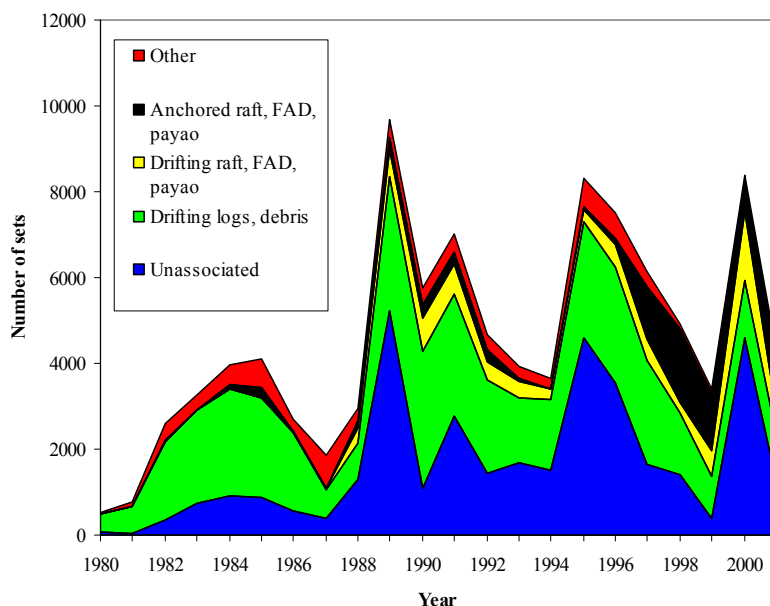


Figure 1. Number of purse seine sets by set type in the PNG EEZ by year, 1980-2001 (Source: National Tuna Fishery Status Report – PNG. SPC, October 2002)

Table 2. Breakdown of set types in the PNG EEZ, 1998-2002 (Source: SPC/NFA data)

	1998	1999	2000	2001	2002	Overall
Anchored FAD	37.6	40.4	15.9	30.5	37.4	30
Drifting FAD	3.7	15.9	11.2	8.7	6.4	9
Log	28.9	30.8	16.9	27.8	29.1	25
Unassociated	18.3	7.7	33.9	19.4	17.9	22
Bait schools	11.5	5.2	22.2	13.5	9.2	14
No. of sets	5,920	3,834	9,393	5,946	5,297	

The PNG purse seine catch is taken by a mix of vessel types, as follows:

- domestic vessels (mostly smaller vessels, operationally based in PNG and unloading all or most of their catch in PNG; fish extensively in archipelagic waters, and operate in association with motherships)
- locally-based foreign vessels (which are associated with PNG, have some commitment to eventual unloading of the catch there, but take most of their catch outside waters; fish beyond archipelagic waters)
- Non-PNG FSM Agreement vessels, based in other Pacific Islands; fish beyond archipelagic waters
- bilateral foreign access vessels (which take varying amounts of their catch in PNG waters and tranship all the catch; required to fish outside archipelagic waters)
- US multilateral access vessels (as above)

The number of vessels of each type, by flag, and their primary set type or mode of operation is summarized below, in Table 3.

Table 3. **Purse seine fishery composition, by vessel type, 2002**

Vessel type	Nationality/flag	No. of vessels	Operational type
Domestic	PNG	6	Anchored FAD, some drifting FAD
	Philippines	11	Anchored FAD, log
Locally-based foreign	Vanuatu	7	Free schools
	Neth. Antilles	1	Free schools
FSM vessels	Various	15	Free schools
Bilateral	Korea	26	Free schools
	Taiwan	36	Free school /drifting FAD, log
	Philippines	10	Anchored FAD, log
	China	2	
USMLT	USA	26	Free school / drifting FAD

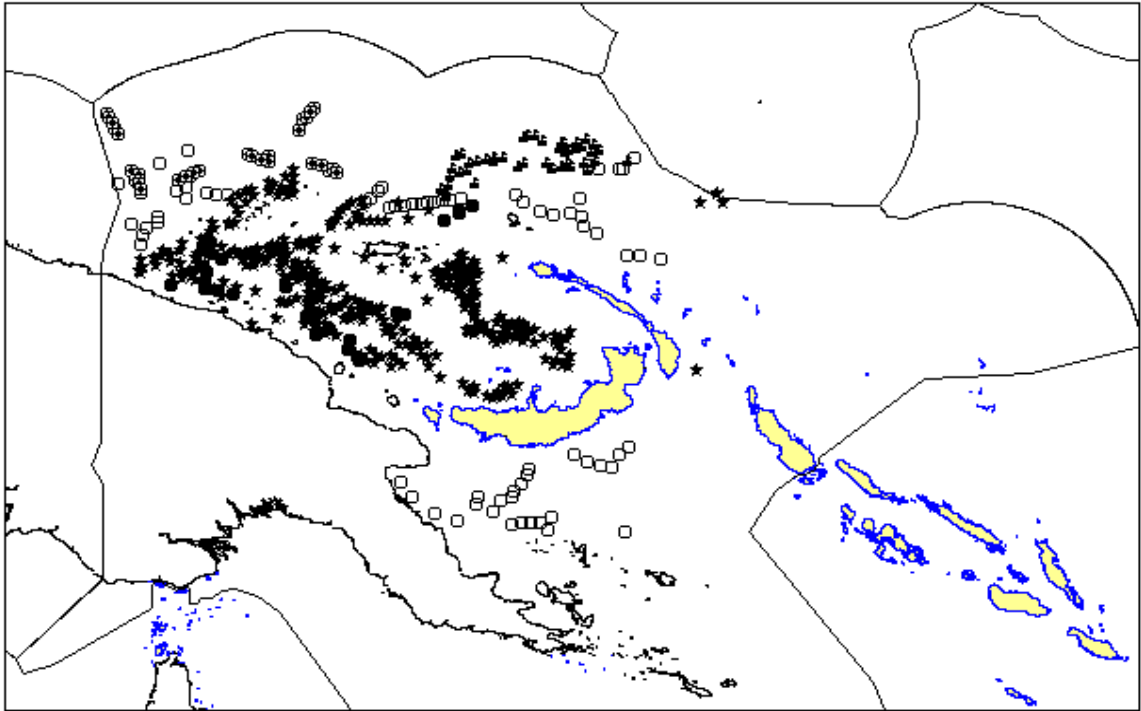
Location of FADs

Nearly all the **anchored FADs** are deployed by the Philippines fleets, both *domestic* (17 vessels) which set most of their FADs within the archipelagic waters of the Bismark Sea, and *bilateral access* vessels (10) which tend to set FADs north of the Equator, outside archipelagic waters as required, and to a lesser extent, in the entrances to the Solomon Sea.

Figure 2 shows the current known distribution of anchored FADs in PNG waters. Around 900 FADs are believed to be currently deployed. Note that FAD deployment in the designated Morgado Square remains prohibited for commercial operations.

Drifting FADs have been used by both DWFN vessels, mostly on northern and north-eastern parts of the EEZ, and domestic vessels in recent years, mostly in archipelagic waters. Little direct information is available on their use

Figure 2. Locations of anchored FADs deployed in the PNG EEZ by domestic and foreign access vessels (Source: NFA data provided by companies)



FAD deployment and design

Anchored FADs are deployed by support vessels of each company, which also maintain attraction lights around FADs and monitor fish aggregations below them. Table 4 below lists the number of support vessels by company, plus the number of FADs currently in place. Under the recently adopted FAD policy, limits have been placed on both the number of FADs allowed per purse seine vessel and the number of support vessels to be licensed per company.

Catches by both domestic and bilateral access purse seine may be transferred at sea to licensed motherships; in the case of domestic vessels associated with onshore processing facilities, these motherships unload directly to the facilities. In the case of those fleets, either domestic or access, which tranship catch for subsequent export, motherships can also be licensed as reefer carriers, but must clear in designated ports before the export occurs.

The main anchored FAD type in operation in PNG continues to be the torpedo shape welded drum, with palm leaves or disused net as appendages and typically 6 concrete filled 200-litre drums as the anchor.

Drifting FADs have been used to some extent by one company, which has expressed some intent to gradually move away from anchored FAD use, for reasons of cost and in recognition of possible resource concerns.

Table 4. Number of vessels licensed by company and FADs currently deployed, 2003

Company	P/s vessels	Light boats	Ranger/ other	Mothership/ reefer carrier	FAD number
RD Fishing	11	10	22	8	440
Frabelle PNG	5	3	-	2 (2)	23
Pacific Blue Sea	1	6	-	1 (1)	Unknown ¹
Frabelle FC (Phils)	7	9	-	6 (6)	725
SAFI	2	8	-	2	43
TPJ	1	2		1(1)	30
TOTAL	27	38	22	20 (10)	610 +

¹ Refused to supply data

Monitoring of FAD catches

Observer programme

The large PNG observer programme incorporates coverage of purse seine vessels involved in mothership operations, all of which primarily involve FAD-associated fishing (100 % coverage target), foreign purse seine vessels (5% target, but to increase to 20% over time, in line with regional objectives), FAD deployment (100% target) and, in the past, mothership and reefer carrier transshipments. Table 5 summarizes the number of observer sea days by year and gear type achieved by the programme. The overall coverage of fishing days and catch in the purse seine fishery in the PNG DFZ has been around 5% in most years since 1997. This has generated a wealth of information on size composition, species composition and fishery operational details that have yet to be fully analysed and are not presented here.

Table 5. Summary of observer sea days by year and selected gear type

(Source: NFA observer data)

	Purse seine (Phils/PNG)	Purse seine (Foreign)	Mothership/ reefer	Tuna longline	FAD deployment	TOTAL
1998	452	91	491	14	?	1,048
1999	200	317	1,283	195	65	2,060
2000	962	157	1,548	46	104	2,817
2001	1,512	642	1,593	574	41	2,962
2002	2,639	330	335	357	29	3,690

The species composition of the tuna catch for three set types, for four fleets, based on the observer data for 2002 and prior to 2002, is shown in Table 6. It indicates the relatively high proportion of yellowfin in the catch (often >40%) by the PNG and Philippines vessels for all three set types, but especially for associated (FAD and log) sets. The percentage of bigeye in the catch is highest, as expected, in the log and FAD sets, and is particularly high in the FAD sets by the PNG and Philippines fleets. The combined yellowfin plus bigeye % exceeds 60% in FAD sets by these two fleets. There is some indication that the percentage of yellowfin and bigeye may have been higher in 2002 relative to earlier years.

Table 6. **Observer tuna species composition (%) by fleet and set type, for two time periods (pre-2002, and 2002)** (Source: SPC observer database)

	Observer trips prior to Jan 2002			Observer trips during 2002			
		UNA	LOG	FAD	UNA	LOG	FAD
PNG	# sets	26	9	62	39	47	259
	SKJ	53	67	34	69	37	40
	YFT	45	19	42	31	52	44
	BET	1	13	24	-	11	15
Phils	# sets	87	116	283	30	92	104
	SKJ	46	52	63	64	39	36
	YFT	49	39	28	33	47	40
	BET	3	8	8	1	11	20
Taiwan	# sets	708	280	115	32	33	6
	SKJ	70	66	57	82	73	64
	YFT	26	24	26	14	22	26
	BET	4	9	17	4	4	9
Korea	# sets	180	80	18	8	7	0
	SKJ	84	81	83	57	59	
	YFT	15	11	13	43	31	
	BET	-	1	3	-	8	

Port sampling

Port sampling of the tuna fishery catch was recently recommenced after some years of intermittent inactivity. During 2002, 20 purse seine transshipments or unloadings were sampled, mainly in Kavieng, Lae and Rabaul.

Size composition of catches

Extensive data on size composition of catches from FAD and log sets are collected during observer trips and port sampling activity, but are not currently available in disaggregated form.

FAD-related Legislation and Management

Fishery Management Act 1999

The Fisheries Management Act 1999 is the primary legislation providing for the management, development and sustainable use of fisheries in PNG. It provides, *inter alia*, for the establishment of NFA and the application of Fishery Management Plans. FADs are defined under the Act but details of their deployment are deferred to the subsidiary Regulations.

Fishery Regulations

Part X of the current Fisheries Management Regulations 2002 (now under revision), *Fish Aggregating Devices*, provides for the deployment, marking, reporting requirements, disposal of, liability for, and fisheries research associated with fish aggregating devices. The Regulations establish that deployment of FADs is subject to the approval of NFA, through the Managing Director, that such permission “*shall not confer any exclusive right to fish in the vicinity of the device*”, and that various other conditions shall apply. They also establish that permission to deploy FADs should not be given to foreign fishing vessels to deploy FADs in archipelagic waters, for any vessels to deploy FADs in territorial seas for purse seine fishing, or in navigational routes.

National Tuna Fishery Management Plan

The National Tuna Fishery Management Plan of 1999 provides a management framework for the development of the tuna fishery and an application framework for the management requirements provided for by the *Fisheries Management Act 1999*. The Plan makes minimal reference to the use of FADs in the fishery, but does provide for the regulation of *“the deployment and utilization of artificial fish attractants, including anchored fish aggregation devices (FADs or payaos), that may cause gear conflict and fishery interaction, or have adverse biological impact on the tuna stocks”*. Application of the Plan to the longline, purse seine and pole-and-line fisheries provides that their management shall take into account all related activities, including the use of fish aggregating devices. The Plan, currently under active revision, does however not specifically provide for the management of FADs.

FAD Management Policy

Following lengthy consultation and discussion with industry, a National Fish Aggregating Device Management Policy was approved by the NFA Board late in 2002. The Policy, consistent with the Act, Regulations and Management Plan, provides for the following:

- Limits on the number of anchored FADs to be deployed in the PNG DFZ, this number not to exceed 1,000, with a per-vessel limit of 30, except where 75% of the catch is processed onshore, where it shall be 40 per vessel.
- FADs deployed for artisanal and gamefishing purposes are outside the restrictions imposed by the Plan
- Approval to deploy anchored FADs is required, with the provision that such deployments be subject to observer coverage
- Minimum design standards, marking and locational requirements (with respect to navigational routes) apply
- Quarterly reporting requirements of the location of FADs apply
- Closed areas are established, including the Morgado Square, the whole Solomon Sea and within 12 miles of any land or island
- Procedures to minimize gear conflict between purse seine and longline fishing
- Monitoring and reporting requirements for the FAD-based fishery
- Reaffirmation of the non-exclusive nature of fishing around FADs, and the prohibition of any company-exclusive fishing areas
- Restriction on the number of tender/support vessels per catcher/net vessel to three (3).
- Restriction of FAD deployment zones to “generally” north of five degrees south.

The Policy is presently under implementation, and its effectiveness remains to be established.