

Visual Observation on Fishes Schooling and Fishing Activities in the South China Sea, Area III : Western Philippines

Aussanee Munprasit

SEAFDEC/TD P.O. Box 97, Phrasamutchedi, Samut Prakan 10290, Thailand.

E-mail : aussanee@seafdec.org

ABSTRACT

Many schools of small bonito were observed at latitude 18°-19° N, longitude 118°-119° E, school of pompano dolphinfish *Corphaena equiselis* (Linnaeus, 1758) was also found and sampling during lured by light at night. Surface schooling of yellowfin tuna *Thunnus albacares* (Bonnaterre, 1788) skipjack, *Katsuwonus pelamis* (Linnaeus, 1758) were found at latitude 14°-15° N and longitude 117° -118° E. Many fish schools were observed through acoustic equipment, Furuno FQ-70 at near shore of Zambales and off shore at latitude 13° - 14° N, longitude 117° - 118° E, in the deep layer of 100-250 meters depth. Oceanic squid has widely distribution over the area. Fishing activities are target on those resources. Tuna longline fishing operation was observed at latitude 16°-17° N and longitude 116°-117°E about 150 nautical miles away from shore. Payaws were set along the coastal line from northern Luzon until northern of Palawan and from near shore until 30-80 nautical miles away from coastline. Payaw in the central part were aimed for purse sein operation while the northern Payaw aimed to handline fishing. Handline fishing occupied all most near shore area from northern to the south. Squid fishing was observed many near Sanfernando.

Key word: Western Philippines, pelagic species, tuna-like fishes, oceanic squid, schooling, payaw, purse seine.

Introduction

Western Philippines is an Oceanic fishing ground of the Philippines. Main fisheries resources are pelagic species of the ocean such as tuna, tuna-like fishes, marlin, shark, squid and others. The SEAFDEC Interdepartmental Collaborative Research Program was emphasized on these resources, tuna is the most abundant resources in the ocean. The production of tuna and tuna-like fishes in the Philippines were 383,000 tons in 1995 (SEAFDEC, 1997), it was the biggest fishery industry of the country. Twenty-one species of tuna occur in Philippines waters but only four are caught in commercial quantity, namely, the skipjack *Katsuwonus pelamis* (Linnaeus, 1758), yellowfin tuna *Thunnus albacares* (Bonnaterre, 1788), eastern little tuna *Euthynnus affinis* (Cantor, 1849) and frigate tuna *Auxis thazard* (Lacepede, 1800). Important fishing gears used by commercial fishing boats were purse seine and ring nets operated in combination with fishes aggregating devices or called payaw and tuna longline. While the municipal tuna fishing which they had produced the most productive are small boat handliner. Northwestern Luzon is one of the most important tuna fishing ground of the Philippines. (Aprieto, 1980) Other group of fishery resources of this area is oceanic squid, few species of squid were observed in local market of Masinloc, Zambales on January 1998. One confirmed species was purpleback frying squid

Sthenoteuthis oualaniensis (Lesson, 1830). And other interesting species is diamondback squid *Thysanoteuthis rhombus* Troschel, 1857. Philippine fisherman caught this oceanic squid in the northeastern of Cebu, Camotes Sea by jigging and it has more abundance in Philippine waters (Jonathan 1996). These two oceanic squid have widely distribution in the tropical waters, they were found also in the Andaman Sea. (Nateewathana, 1995 and Nateewathana, Hylleberg 1989). Squid fishing in the Philippines mainly by jigging and scoop with luring light but diamondback squid is usually caught by jig in daytime.

Inorder to know situation of fisheries resources in the study area, the survey in various fields were designed such as resources survey by acoustic method, primary and secondary production were studied, oceanographic condition of fishing ground were investigated and fishing trials were designed to be carried out at the same time by research vessel, M.V. SEAFDEC. However, visual observation for fish school and fishing activity on the survey area was also very useful, it will provide others related information to those survey. And it could also provided some kind of information which they could not be covered by those survey and study, such as fish schooling on surface, fishing ground area, kind of fishing activities etc.

Method

Along the cruise of M.V. SEAFDEC no. 50-4/1998, the collaborative research survey in South China Sea, Area III : Western Philippines, fish school and fishing activities on the survey area were observed by sighting through binocular or through acoustic equipment, echo-sounder, scanning sonar. The observation by eye-sight and through binocular was conducted only in daytime, while the observation through echo-sounder (scientific echo-sounder, Furuno FQ-70) was conducted sometimes at day or night (Figure 1). Scanning sonar was seldom used due to very few fish schools were found near the vessel (more than 1,000 meters). Three kind of binocular were used. 7x50 power 7.3°, 10 x 50 power 5.1° and 20 x 120 power with 3° visual angle. Generally 10 x 50 power with 5.1° binocular was used, it could be covered with the radius of 3-5 nautical miles, and the observation was carried out from compass deck (above navigation bridge). The observed school and fishing activity was record in the sighting data sheet. (Annex 1) And they were also recorded by photo and VDO camera, others marine animals were also observed and recorded such as dolphin, whale and seabird. Then all data, photos and VDO tape were checked and analyzed together with others survey data again at office in SEAFDEC/TD, Samut-Prakan

Results

The visual observation for 22 days on board M.V. SEAFDEC cruise No.50-4/1998 was carried out from April 17, 1998 at station No. 1 until May 8, 1998 at station No. 31. Fish school and fishing activities were observed continuously along the cruise track, they could be concluded in four kind of things, fishes school, marine mammal, fishing activities and fishing ground of the Western Philippines. These were observed during daytime by sighting through binocular and observed from acoustic equipment sometime, the summary is shown in Figure 2.

Fishes School

Not many surface schooling were observed. Schools of small bonito and small fish were observed at off shore of northwest of Luzon (about 120 miles away from shore). Surface schooling of yellowfin tuna, *Thunnus albacares* (Bonnaterre) and skipjack, *Katsuwonus pelamis* (Linnaeus)

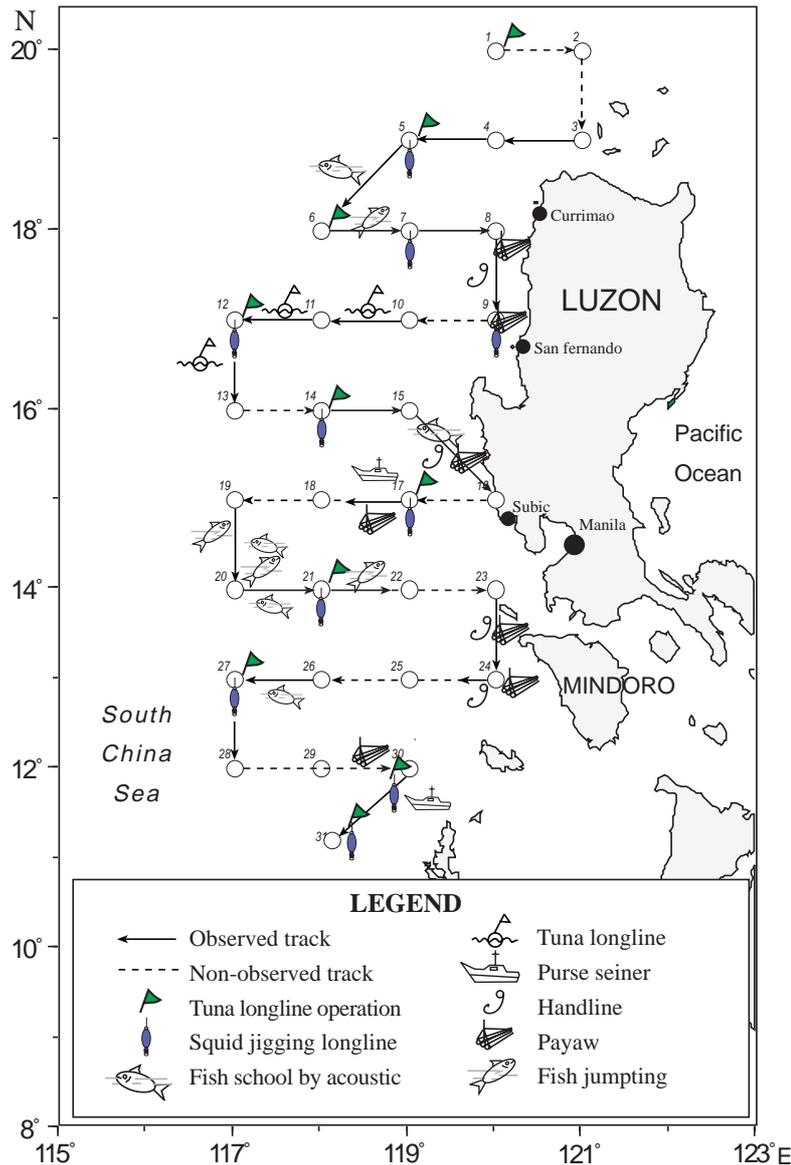


Fig. 1. Route of visual observation.

were found at latitude 14° N and longitude 117°-118° E, size of fish about 3-5 kilograms for skipjack and 10-30 kilograms for yellowfin tuna (estimated by sighting). Schooling with flock of bird was observed only one area at latitude 13° N and longitude 117°-30'.0 E, which fish could not be observed on the surface. Big school of dolphinfish, *Coryphaena hippurus* (Linnaeus, 1758) was observed at the first station. Pompano dolphinfish, *Corypharena equiselis* (Linnaeus, 1758) schooling was observed in small school (10-100 fishes) at the surface during oceanographic survey and squid jigging operation in the night at all most of off shore stations. Most of its samplers taken by handline were full of eggs in their belly. There were a lot of fish schools in deeper layer observed through scientific echo-sounder, Furuno FQ-70 at 100 to 250 meters depth. Mostly they were found at near shore area of zambales coast and off shore at latitude 13° N, longitude 117°-118° E 150 nautical miles from coastline.

Marine mammal

Dolphin has wide distributed over the area, large school (over 100 dolphins) was observed near shore in the northern, off Zambales and at latitude 14° N., longitude 117°-118° - 30'.0 E

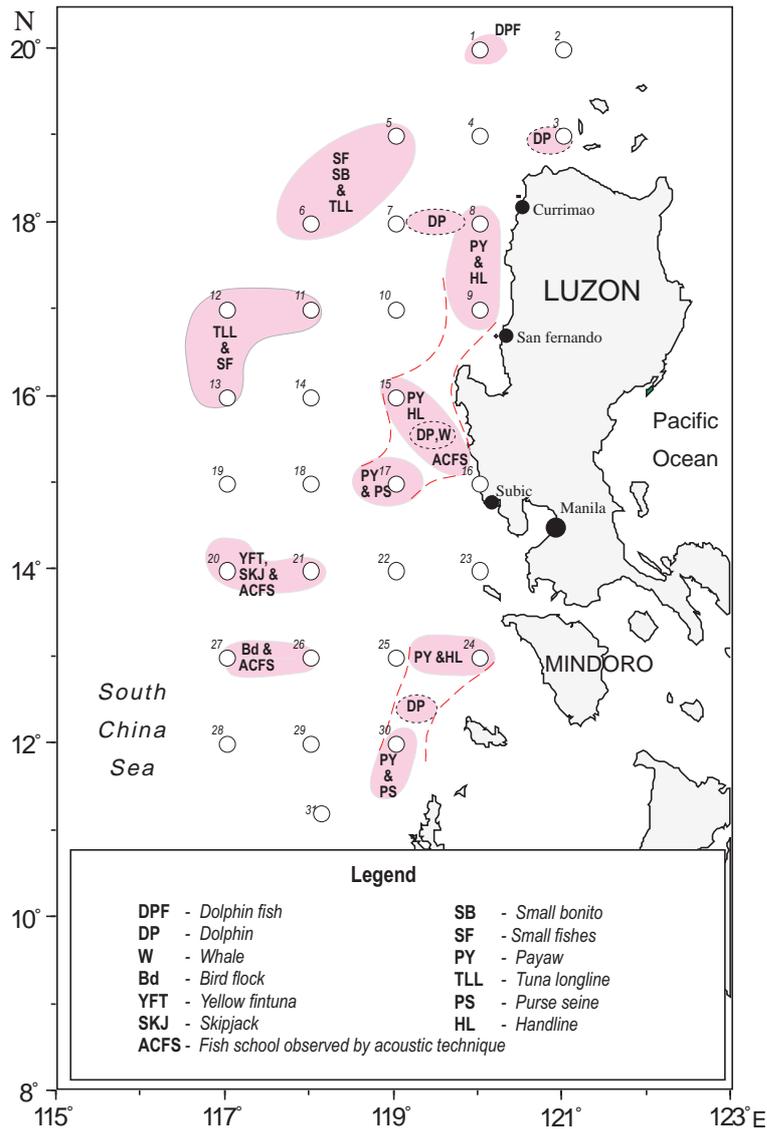


Fig. 2. Summary result of the visual observation.

150 nautical miles east of Manila bay. Few schools of small whale appeared near Zambales coast.

Fishing activities

Tuna longliners and their operating fishing gears were observed in off shore waters, 150-200 nautical miles east of Sanfernando. Almost of them were small size tuna longliners, 20-50 grosstonnage boats, direction of line setting was east-west. Ring neters and purse seiners were observed in the central part of the area, at 60-80 nautical miles east of subic bay. One large purse seiner was observed at 50 miles east of Mindoro Island (over 200 GT.). All of them operated in combination with fish aggregating devices (FAD) or payaw. Handline and trolling were the most fishing activities on the area, they fish in payaw area. Target species were tuna, tuna-like fishes and mackerel. Handlines occupied almost of payaw area close to the shore, 30-80 miles from coast line. Small out-rigger boat with inboard engine was their fishing vessel, size various from 5 to 10 meters long which they could sail at 10 to 15 knote. Squid fishing by jigging, scoop with luring light was observed at fishing ground near Sanfernando. Target catch were both oceanic and nerritic squid in the deep water near to the shore.

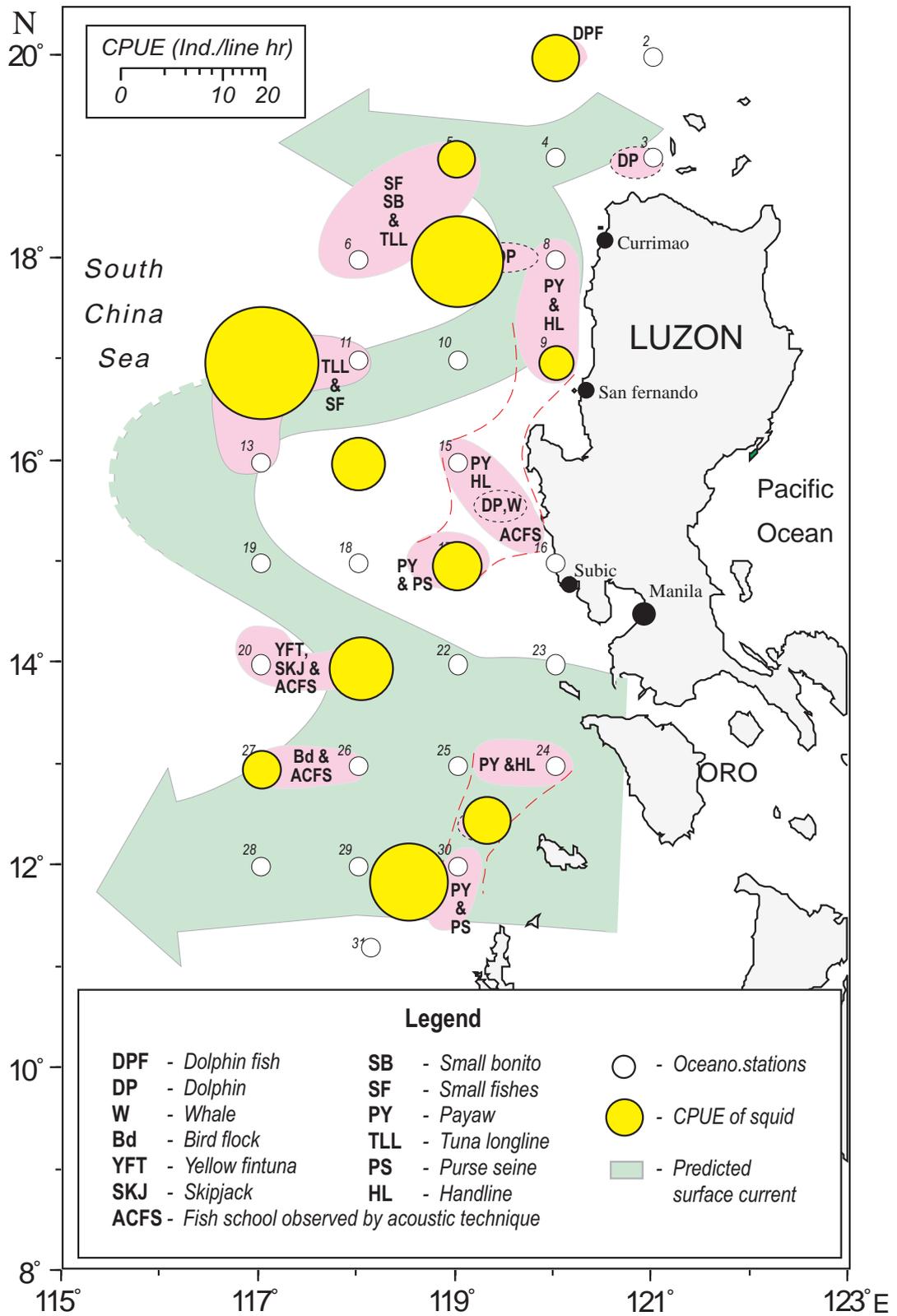


Fig. 3. Summary result in relation to surface current and catch efficiency of squid Jigging



Fishing Ground

There were a lot of payaw set along the coastline of Luzon from the north to the South (north of Palawan island), in the zone of 20-80 miles from coastline. Handlines occupied almost of payaw area while ring netters and purse seiners were observed many effort in the central and southern of the area. Tuna longline fishing ground was observed at off shore waters in the northeastern. Oceanic squid has distributed over the survey area, most abundance was observed in the northern part. Other interesting fish school in deeper water were observed at near shore of Zambales and off shore waters 150-200 miles east of Mindoro island. The species were not confirmed in this survey.

Discussion

In connection with this observation, the data and information of the visual observation was considered together with the preliminary result of squid jigging and geostrophic and residual current projects, summary result of this study is shown in Figure 3. The study shown some relation among the result of these three projects, it show some interesting area which should be good fishing ground of the Western Philippines, they were off-shore waters 120-150 miles east of Currimao (lat. 18°-19° N, log. 118°-119° E), near shore waters of Zambales (lat. 15°-16° N, long. 119°-120° E) and off-shore waters 180-200 miles east of Mindoro island (lat. 13°-14° N & long. 117°-118° E). Fish school in the deeper layer of those areas should be confirmed by using mid water trawl. Oceanic squid fishing could be promoted in off shore waters of the western Philippines.

Acknowledgement

The author would like to thank Dr. Somboon Siriraksophon and Mrs. Nathacha Sornvaree for helping manuscript preparation.

References

- Aprieto, V.L. 1990. Philippine Tuna Fisheries: Resources and Industry. *Fish. Res. J. Philippines*. 5(1): 53-66.
- Dickson, J.O. 1997. Giant squid jig technology in Northeastern Cebu, Philippines. Special report, SEAFDEC. Bangkok, 15 p.
- Nateewathana, A. 1992. Two species of oceanic squid from the Andaman sea, Indian Ocean. Systematic of Cephalopoda of the Andaman sea. *Phuket Mar. Biol. Cent. Res. Bull.*, 57: 1-40.
- Nateewathana, A. and J. Hylleberg. 1989. First record of oceanic squid, *Thysanoteuthis rhombus* Troschel, 1857 (CEPHALOPODA : TEUTHIDEA) in Thai waters. *Nat. Hist. Bull. Siam Soc.*, 37 (2): 227-233.
- SEAFDEC. 1995. Fishing Gears and Methods in Southeast Asia Volum III : The Philippines. Training Department, Samut Prakan, 341 p.
- SEAFDEC. 1997. Fishery Statistical Bulletin for the South China Sea Area, 1995. Secretariat, Bangkok, 159 p.
- Tokai University. 1984. The fishes of the Japanese Archipelago. Tokai University, Tokyo, 437 p.

Appendix 1/1

SIGHTING LOG SHEET

Ship name : M.V. SEAFDEC

Duration : 15/014-11/5/98

Cruise No. 50-4/1998

Survey Title: Collaborative Research Area III

Date	Time	Position		Sea Condition	Observed objects description
		Latitude	Longitude		
4/17/98	20:00	20°-03.0' N	119°-55.0' E	Smooth	school of dolphinfish around the boat during squid jigging at station 1
4/18/98	15:00	20°-00.0' N	120°-03.0' E	Slight	acoustic survey from St. 1 to St. 2
4/19/98	7:00	19°-59.0' N	120°-53.0' E	Slight	acoustic survey from St. 3 to St. 4
4/19/98	8:35	19°-00.0' N	120°-43.0' E	moderate	big school of dolphin > 100 pieces
4/19/98	9:00	19°-00.0' N	120°-39.0' E	moderate	small flock of bird (10-15 ps.)
4/19/98	13:50	19°-00.0' N	120°-00.0' E	Slight	acoustic survey from St. 4 to St. 5
4/19/98	20:30	18°-59.0' N	118°-59.0' E	Slight	small bonito gathering around boat
4/20/98	15:00	18°-55.0' N	118°-51.0' E	Swell	proceed to St. 6 and sighting
4/21/98	6:00	17°-58.0' N	117°-51.0' E	Smooth	one tuna longline in operation
4/21/98	14:20	17°-54.0' N	118°-04.0' E	Smooth	acoustic from. St. 6 to St. 7
4/21/98	16:35	18°-00.0' N	118°-20.0' E	Smooth	school of small bonito jumping
4/22/98	6:00	18°-00.0' N	119°-25.0' E	Slight	on the way acoustic to St. 8
4/22/98	6:40	18°-00.0' N	119°-35.0' E	Smooth	Dolphin school 20-30 pieces
4/22/98	8:10	18°-00.0' N	119°-49.0' E	Smooth	payaw, oil drum type and 5 buncus of handline operation
4/22/98	9:15	17°-59.0' N	119°-56.0' E	Smooth	at survey station 8
4/22/98	10:00	19°-58.0' N	120°-00.0' E	Smooth	proceed to station 9
4/22/98	12:00	19°-48.0' N	120°-00.0' E	Smooth	there are many payaw oil dum type
	14:00	17°-27.0' N	120°-00.0' E	Smooth	on the area about one mile interval
4/22/98	15:30	17°-05.0' N	120°-00.0' E	Smooth	area of payaw bamboo type
4/25/98	7:00	17°-00.0' N	118°-14.0' E	Smooth	acoustic from. St. 10 to St. 11
4/25/98	11:00	17°-00.0' N	117°-59.0' E	Smooth	Tuna longline gear in the sea at St. 11
4/25/98	13:30	17°-00.0' N	117°-30.0' E	Smooth	TLL gear in the sea, proceed to St. 12
4/25/98	14:00	17°-00.0' N	117°-28.0' E	Smooth	TLL boat and dolphin school 5-10 ps.
4/25/98	15:00	17°-00.0' N	117°-18.0' E	Smooth	3 TLL boats (30-40 GT) on the fishing ground
4/26/98	14:00	17°-03.0' N	117°-03.0' E	Slight	proceed to St. 13
4/26/98	15:30	16°-50.0' N	117°-00.0' E	Slight	school of small fish on surface
4/26/98	17:00	16°-36.0' N	117°-00.0' E	Slight	TLL gear in the sea.
4/28/98	8:00	16°-01.0' N	118°-59.0' E	Slight	from St. 15 proceed to St. 16
4/28/98	9:00	15°-52.0' N	119°-07.0' E	Slight	fish school at 100-250 meters layer
	10:00	15°-45.0' N	119°-14.0' E	Slight	many fish school were observed
4/28/98	11:00	15°-37.0' N	119°-22.0' E	Smooth	by acoustic equipment, Furuno FQ-70 payaw area, drumtype, small buncus hanline operation
4/28/98	12:30	15°-25.0' N	119°-37.0' E	-	dolphin and small whale observed
	14:00	15°-14.0' N	119°-45.0' E	-	small boat (buncus) handline and whale school about 10 pieces

Appendix 1/2

Date	Time	Position		Sea Condition	Observed objects description
		Latitude	Longitude		
	15:00	15°-07.0' N	119°-52.0' E	-	many payaw at 25-30 miles from shore, big school of dolphin 20-30 ps
4/28/98	16:00	15°-00.0' N	120°-00.0' E	-	arived St. 16
4/29/98	14:20	15°-02.0' N	119°-02.0' E	Smooth	acoustic survey from. St. 17 to St. 18
4/29/98	15:00	15°-00.0' N	118°-53.0' E	Smooth	3-4 purse seiners and payaw in the area, large Purse seiner at St. 17
4/29/98	17:30	14°-59.0' N	118°-30.0' E	Smooth	purse seiner on fishing ground
4/30/98	6:00	15°-00.0' N	116°-59.0' E	-	proceed to St. 20
4/30/98	8:25	14°-47.0' N	117°-00.0' E	Slight	school of yellowfin tuna medium size 20-30 kilogram jumping observed in far distance 1-1.5 mile
4/30/98	10:15	14°-11.0' N	117°-00.0' E	Slight	school at skipjack small size and many fish school in deeper layer observed by acoustic equipment 250-300 meter deep some school on surface
4/30/98	13:45	14°-00.0' N	117°-09.0' E	Slight	Leave St. 20 to St. 21. Many school were detected by acoustic survey 50 meters deep., school of dolphin (50ps.)
4/30/98	20:00	14°-01.0' N	117°-59.0' E	Slight	jigging at St. 21 pompano dolphinfish was sampling
5/1/98	14:00	14°-01.0' N	118°-01.0' E	-	acoustic from St. 21 to St. 22
5/1/98	15:00	14°-00.0' N	118°-01.0' E	-	school of dolphin 10-20 pieces
5/1/98	16:35	14°-00.0' N	118°-15.0' E	-	few skipjack feeding on surface
5/4/98	9:50	14°-00.0' N	120°-00.0' E	Slight	acoustic from St. 23 to St. 24
5/4/98	14:35	13°-11.0' N	120°-00.0' E	Smooth	Payaw area, many handline boats. (5-10 bunch) payaw drum type
5/4/98	15:50	13°-00.0' N	119°-59.0' E	Smooth	Oceanographic survey at St. 24 many payaw and handline bunch
5/5/98	8:50	13°-00.0' N	117°-58.0' E	Slight	acoustic from St. 26 to St. 27
	13:30	13°-00.0' N	117°-10.0' E	Slight	flock of bird (20-50ps) fish below surface may fish were detected by FQ-70 at 250-350 meters deep.
5/6/98	14:30	13°-00.0' N	117°-00.0' E	Slight	proceed to St. 28
5/7/98	6:30	12°-00.0' N	118°-00.0' E	Slight	acoustic from St. 29 to St. 30
5/8/98	10:30	11°-13.0' N	118°-20.0' E	Slight	one large purse seiner and payaw