

ORIGINAL: ENGLISH

SOUTH PACIFIC COMMISSION

TWENTIETH REGIONAL TECHNICAL MEETING ON FISHERIES
(Noumea, New Caledonia, 1 - 5 August 1988)

COUNTRY STATEMENT - REPUBLIC OF PALAU

Introduction

1. The Republic of Palau is located in the Western Tropical Pacific between Latitudes 7 and 8 degrees N. and Longitudes 134 and 135 degrees E. approximately 800 miles Southwest of Guam and 500 miles east of the Philippines. The Palau archipelago consists of numerous central islands ranging geologically from volcanic origin to up-lifted limestone. These are encircled by a 246-mile long barrier reef encompassing a lagoon with an area of 560 square miles. The reef in most places exhibits a steep face that slopes away to a great oceanic depth, but there are a few re-entrants in the reef that provide semi-sheltered deep bays with less-pronounced bottom slopes than the fore reef face. To the north are two small coral atolls and the extensive Velasco Bank system. To the south in close proximity is the island of Angaur, and further south are the six outer islands collectively called the South West Islands. The National Headquarters, in Koror, is centrally located; over half the population (8,000) of the Islands reside in Koror. It is the major landing area for commercial marine products. All villages actively involved in commercial fishing are within 60 miles to the north and 40 miles to the south.

Political Status

2. The Republic of Palau, with over 15,000 residents, is probably the Pacific's last Trusteeship established some 40 years ago by the United Nations. A year ago the majority of the people approved the Compact of Free Association with the United States of America, which is at present, pending, awaiting the approval of the U.S. Congress. The proposed Compact, if approved, would end the Trusteeship with the United Nations, and further would make the Republic become a self-government.

Present Status of the Fishing Industry

3. Like other islands in the Pacific, exploitation of Palau's Marine Resources provides a substantial portion of the Republic's economic base. This has largely involved commercial fishing on a large scale for tuna, and on a medium scale for reef fishing by independent local fishermen. As the number of fishermen increases each year, more businesses are becoming involved in fishing activities. Now, new fishing resources are identified and technologies are added to the old ones; better fishing equipment and gears are becoming more readily available, the Republic fisheries industry is slowly growing.

4. Offshore fishing for pelagic species, particularly tuna, is conducted primarily by foreign vessels which must pay the Republic for fishing licences. Revenues from this resource amount to about \$220,000 - \$250,000, plus contribution in kind. In addition to these foreign vessels, local involvement includes one locally owned and operated live-bait pole and line tuna boat which supplies fresh tuna for domestic consumption. Additionally, four new boats have been acquired and fitted for live-bait pole and line tuna fishing and will join the above lone operator in the next few days. Moreover, the former Van Camp facility has now been reactivated as a longline tuna base with a fleet of 52 tuna longliners.

5. Inshore and nearshore commercial fishing is done with a variety of different sizes of boats ranging from outboard engines to diesel drive engines, including the 10 locally operated displacement hull diesel craft (35 ft. in length) which were donated to the Palau Government by the Government of Japan in 1983. These grant-in-aid vessels and other smaller locally owned and operated power crafts produced a commercial catch of 736,148 lbs. in 1986 and 627,855 lbs. in 1987. These figures do not include catch sold by fishermen direct to local outlets and/or sold in the villages.

6. A commercially important resource, the trochus fishery, is a seasonally significant source of revenue for many local residents of the Republic. Harvest season is normally during the summer months where school children participate in the fishing with their families. This is one fishery where both sexes earn money, including children. Average annual catches during one season range from 100 to 300 tons, with a dockside value reaching \$100,000 to \$300,000 in 1988. The raw product is shipped to Japan and other Asian countries depending on who is buying.

7. Other marine products which are commercially exploited, in some cases, to a certain extent, include: beche-de-mer, shark, lobster, crab, clam, turtle, crocodile, aquarium fishes, and pond products. However, data on total landings or processes on these products are not available at this time. A plan is underway to include all statistics in the Fisheries Statistics Program.

Organisation and Responsibility

8. The Bureau of Resources and Development, Division of Marine Resources within the Ministry of National Resources, is the agency concerned with marine resource exploitation, development, and management of the Republic. Along with the Ministry and the Bureau, the Division of Marine Resources is also branched as (1) management and conservation service; (2) development and extension services; and (3) mariculture and research.

9. There are also two other agencies which were created by Public Laws with given responsibility. They are: (1) Palau Maritime Authority which is responsible for activities relative to the 200-mile EEZ; and (2) Palau Fishing Authority which is responsible for the management of chartered fishing cooperative associations and administration of a loan program for member fishermen.

Programs and Projects

10. The following programs and projects are targeted in accordance with the Marine Resources sector of the National Five Year Indicative Development Plan (1987 to 1991).

Donor Agency	Project Title	Funding	Duration	Status	Remark
1. PFDF	Small-scale cannery feasibility	45,000	1986	completed	Sub-regional
2. ICOD	Ocean resources management	17,000	1986	completed	
3. JICA	Turtle proj. (equip)	125,000	1987	completed	
4. UNDP/ FAO	Long term fellowship	15,000	1987	completed	
5. SPC	Data collection evaluation	-0-	1987	completed	
6. SPC	Fish handling advisory	-0-	1987	completed	
7. FFA	Marine Resources Organization Review	6,000	1987	completed	

Donor Agency	Project Title	Funding	Duration	Status	Remark
8. SPC	Master Fisherman attachment	-0-	1987-88	completed	
9. SPREP	Base line survey of National reserve	11,000	1988	completed	
10. FAO/ UNDP	Fisheries Information (Bibliography)	-0-	1987	completed	
11. US.NP	WW.II Sunken ships survey	-0-	1988	completed	
12. PFDF	Deep water shrimp survey	41,000	1987-88	ongoing	
13. DOI	Mariculture Center improvement	280,000	FY 87 and FY 88	ongoing	Clam hatchery
14. Jap.	Pearl Oyster Project	-0-	1985-89	continuing	Pilot proj.
15. NMFS	Fisheries subsistence data collection and survey	25,163	1988	ongoing	
16. JICA	Community fishing bases (4)	8,000,000	1988-91	construction to start Oct.	
17. PFDF	Training material on clam	45,000	1988	approved	Clam
18. ICOD	Regional plan training project	45,000	1988	approved	Clam
19. CTSA	Facility expansion	40,000	1988/open	approved	
20. CTSA	Scholarship Program for training in clam culture	60,000	1988/open	approved	Sub-regional
21. ICOD	Scholarship for diploma course, USP. (Fisheries Officers)	-0-	1988-91	approved	

11. Recently, the Republic of Palau through its Marine Resources Division hosted the five-week practical fisheries training module of the SPC/Nelson Polytechnic Fisheries Officers Training Course from 13 June to 16 July, 1988. The two training officers, Messrs. Alastair Robertson and Michael Wells, arrived with twelve fisheries officers/trainees from the Pacific Islands: Cook Islands, Tonga, American Samoa, Western Samoa, Fiji, Tuvalu, Vanuatu, Solomon Islands, Papua New Guinea, Kiribati and the Federated States of Micronesia. The Division of Marine Resources provides support to the program.

ONGOING PROGRAMS AND PROJECTS

Palau Reef Fish Subsistence Catch Data Collection and Survey

12. From May 16 - 29, Paul Gates and Dave Hamm were in Palau to set up and initiate the Palau Reef Fish Subsistence Catch Data Collection and Survey Project. Paul Gates is a fisheries biologist who works for Western Pacific Fisheries in Honolulu, and Dave Hamm is a data processing specialist from the National Marine Fisheries Service, Honolulu Laboratory.

13. During the two-week period the team:

- A. interviewed Marine Resources personnel to define the exact objectives they intend the project to accomplish.

PROJECT OBJECTIVES

1. Estimate the annual subsistence fishery catch of Palau by gear/method, by state.

The goal was approached by trying to establish a way to estimate annual catch by method, by boat and non-boat fisheries, by household, by state.

This would provide an estimate of total catch, which could be partitioned into commercial and subsistence catch components.

Three additional goals were set:

2. Enumerate all the boats in Palau.
3. Compile a list of the primary species harvested or targeted by each fishing method commonly used.
4. Establish a record of fishermen's impressions of fishing today as compared to 5 years ago.

- B. Spent a couple of days scoping out the area. A trip was made to a number of villages along the eastern coast of Babelthaupt to learn how the more rural areas contrasted with Koror, and to see how these differences would influence fielding the project. Commercial and subsistence fishermen provided input on fishing habits, patterns, and offered advice.
- C. Based on the objectives and scoping out process, a project strategy was devised. Survey forms were designed: one for boat owners, which targets fishing done with boats, and a household survey, aimed at gathering information on non-boat fishing activities.
- D. A sampling scheme was devised that would take into account the demographic differences between Koror, which is considered urban, and the other 15 rural states.
- E. Marine Resources staff that would field the survey were trained to conduct surveys. The reasoning behind each question was explained so staff could thoroughly understand the objectives.
- F. The survey was field tested, both at MMDC and within a Hamlet of Koror. As a result, several questions were modified or added.
- G. Databases were set up to store survey information. MMDC staff assisted in setting up these files and input screens.
- H. The logistics of fielding the survey were studied, and a plan for fielding it was worked out. Survey instructions were written and thoroughly reviewed.

14. From this point, Marine Resources is ready and capable to begin surveying, and the results can be computerized into databases.

15. Marine Resources will keep Paul Gates informed of the project progress. This will determine the timing of a second site visit by the contractor.

Palau Deep-Water Shrimp Survey

16. Work commenced on the final phase of the deep-water shrimp survey in Palau on June 7, 1988. Hastie began re-assembling trapping equipment and constructed a combination trap/camera frame for use with the deep-water remote camera, following a design by Saunders. On June 14, Saunders arrived in Palau, and commenced testing deep-water camera equipment, including newly manufactured camera and strobe ports for extended depth ranges.

17. Trapping was initiated on the western side of Palau, in a large embankment known as West Passage, that had been inaccessible to trapping during the previous year due to strong westerly winds. Depth, bottom profile, and navigational access make this area an attractive trapping site. A total of 17 trap sets was made at depths of 520-800m (Table 1); for the most part, yields were similar to those of last year, with relatively low shrimp yields (dominated by Heterocarpus laevigatus) and high (by weight comparisons) yields of the deep-water crab Geryon.

18. Efforts are currently underway to evaluate the extent to which variables such as trap design, bait consumption by copepods, and soak time might be affecting these yields. A triple-chambered trap has been designed that will permit both shrimp and crab access to outer chambers through large entrance funnels, but access to the central chamber is gained through the use of smaller funnels, which limits egress of the shrimps. First results of the use of the new trap, combined with longer soak time, appear quite successful (Table 1). The deep-water crab (Geryon sp.) is drawing great interest locally; preliminary market efforts have realized the same price for the giant crabs as for lobster (\$3.00/lb.).

19. Analysis of deep-water camera photosequences is underway. Preliminary results indicate that the shallower carideans, H.ensifer, respond differently to baited trap sites than the forms (primarily H.laevigatus), and that bait consumption and trap soak time may accordingly play different roles at different depths. It is apparent that combined trapping for deep-water shrimps and crabs will require modifications of standard present techniques, which focus on just one form. Field work on the project should be completed by the end of July, 1988.

TABLE 1
SUMMARY OF DEEP-WATER SHRIMP TRAPPING RESULTS
West Passage, Palau, June 1988

Trap No.	Trap Design	Bait	Soak t(hr)	Depth (m)	Yield(kg) Shrimp	Main Sp.	%*	Yield(kg) Crabs**
72	STD	SK	26	520	3.38		(87)	4.85
73	PAL	SK	3	560	0.01	<u>Plesionika</u>	(100)	----
74	STD	SK	25	560	0.07	<u>H.ensifer</u>	(82)	----
75	STD	SK	22	640	0.36		(98)	5.27
76	STD	SK	20	650	----	(drifted)		----
77	STD	SK	19	460	0.03	<u>Plesionika</u>	(85)	----
78	PAL	SK	21	650	0.01		(100)	----
79	COM	SK	21	650	0.57		(85)	4.96
80	STD	SK	24	780	0.18	penaeid sp.	(57)	0.95
81	PAL	ES	23	720	0.43		(100)	----
82	COM	SK	23	720	0.61		(83)	3.43
83	STD	SK	22	800	0.30		(96)	2.77
84	PAL	SK	23	800	0.01		(100)	1.61
85	COM	ES	23	800	0.40		(92)	4.52
86	COM	SK	21	640	1.43		(99)	9.43
87	PAL	SK	21	640	0.35		(100)	1.07
88	COM	SK	23	640	2.16		(99)	10.99

Trap design: STD = standard 2m x 1m x 1m
PAL = Palauan fish trap design
COM = combined shrimp/crab trap

Bait: SK = frozen skipjack
ES = deep-water eels (by-catch)

* Main shrimp species Heterocarpus laevigatus unless indicated

** Geryon sp.

Palau Mariculture Center

History

20. The Micronesian Mariculture Demonstration Center (MMDC) was established under the auspices of the Government of Palau and the Trust Territory of the Pacific Islands administration in 1973. (1988) Sources of funding include the U.S. Departments of the Interior, Agriculture, and Commerce; The Pacific Fisheries Development Foundation; the Japan Tortoise Shell Association; ICOD of Canada; and the UN/FAO South Pacific Aquaculture Development Project.

Scope and Activities

21. The MMDC's main function is to develop, demonstrate and promote appropriate mariculture technology for the benefit of Micronesian (Palau) people. MMDC also serves as 1) a local marine science educational facility; 2) a regional mariculture training center; 3) a base for visiting international researchers; and 4) a tourist attraction.

Current Programs

22. The MMDC's six core programs have each been in operation for at least five years. These include:

- giant clam mariculture, seed export and practical training
- hawksbill turtle hatchery (headstarting) and ranching
- marine science education program for local students
- trochus resource assessment and hatchery trials
- visiting scientist program
- tourist exhibits

Cooperative Programs

23. Presently MMDC is collaborating with each of the U.S.-affiliated Pacific Islands, as well as several South Pacific nations, on an experimental giant clam outplanting program. The MMDC hosted a segment of the SPC-Nelson Polytechnic Fisheries Training Course in July-August 1988.

Visiting Investigators

24. Two dormitory buildings with a total of 12 air-conditioned rooms are available for visiting scientists, at \$20 per person per day. Prospective visitors should contact the MMDC Manager for full information regarding costs, logistics and research permit requirements.

Facilities

25. Air-conditioned and ambient laboratory rooms are maintained for visitors at a cost of US\$20 per room per day. There is an extensive flowing seawater system with live holding tanks available. An air-conditioned equipment room contains compound and dissecting microscopes, balances, centrifuge, refrigerator, 20-cubic foot freezer and MacIntosh computers with software.

26. Three boats are available for rental from MMDC: a 12-metre Yamaha diesel for US\$150/day with driver, and two 8-metre Yamahas for US\$80/day with driver (fuel costs are extra). Local drivers are mandatory on all boat trips. Scuba equipment is available for rental at local dive shops.

Public Facilities

27. More than 50 mariculture tanks and aquariums are available for viewing by visitors. Snorkelling is possible on the adjacent clam farm and fringing reef. The MMDC encourages visits by local people and international tourist groups. About 6,000 people visit the facility each year. A modest admission fee is charged.

Publications

28. The MMDC Bulletin is published quarterly and distributed free to an international mailing list of about 300 addresses. A comprehensive bibliography listing articles published on all aspects of mariculture, fisheries and the marine environment in Palau is currently in press, to be published in late 1988 by the UN/FAO South Pacific Office.

Educational Programs

29. The MMDC offers on a continuous basis a practical, 30-day training course entitled "Introduction to Giant Clam Mariculture". The course has been completed to date by about 50 Pacific Islanders. An annual Marine Science Summer Course is offered to 15 college-bound Palauan high school students. Visiting researchers frequently present informal seminars on their projects.

Habitats

30. The Palau Islands offer an astounding variety of marine habitats, most of which are within a 30-minute boat ride of the MMDC. Habitats include sandy beaches and bays, barrier, fringing and patch reefs, mangroves, seagrass beds, marine lakes, underwater caverns and atolls.