

**THE ROLE OF WOMEN  
IN THE  
FISHERIES OF PALAU**

by

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## TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
INTRODUCTION	1
METHODS	3
Note on Palauan names	8
RESULTS	10
Women's fishing and collecting activities	10
Reef gleaning	10
Olengimes: sea cucumber collection	18
Omatairimd: sea cucumber collection	19
Mengduul: mangrove clam collection	20
Fishing	21
Crab collection	25
Commercial activities	27
Processing and other marketing activities	29
Problems and changes affecting women's fishing activities	30
Marketing problems	30
Environmental problems	31
Species that are harder to find	33
Note on questionnaire design	33
DISCUSSION	36
Programs available to aid women in fisheries	45
Recommendations for development and management of women's fishing activities	46
CONCLUSION	48
APPENDIX 1: South Pacific Commission Terms of Reference	49
APPENDIX 2: Palau women's fishing activities survey	51
APPENDIX 3: Marine species collected by women and children	58
APPENDIX 4: Glossary	66
REFERENCES CITED	69

# THE ROLE OF WOMEN IN THE FISHERIES OF PALAU

## EXECUTIVE SUMMARY

A team of three people at the Republic of Palau Division of Marine Resources interviewed 54 women in seven of Palau's 16 states in a three-month study to determine the role of women in nearshore fisheries. The interviews, which generally lasted over an hour each, found that most of the women surveyed use low-technology methods to collect invertebrates and fish from nearshore areas within the barrier reef at low tide. Most women do not own boats and reach collecting areas by foot or bamboo raft. Reef gleaning at low tide for invertebrates is the most common collection method used by these women. Other activities are mangrove clam collection; fishing at night with a torch and a spear; land, mangrove and coconut crab collection and fishing with hook and line, seine, surround and cast nets. Very few women use a speargun to catch fish. Women often collect marine species accompanied by friends and children. Many also fish with their husbands and combine their catch for marketing.

The women interviewed regularly collect eight species of sea cucumbers, four species of sea urchins, seven species of molluscs, three species of crabs and more than 15 species of fish. When they can be found, many other invertebrate species are collected, especially for subsistence use.

Seventy-six percent of the women interviewed regularly sell a part of their catch in several markets and restaurants in the main population center of Koror. Twenty-four percent of the women collect for subsistence purposes alone. All women interviewed keep at least part of their catch for their family, relatives and friends. In addition, thirty-six percent of the women interviewed process and/or market fish and crabs caught by a male relative.

Availability of transportation to the markets and restaurants in Koror is the most common problem facing women from states to the north of town who sell their catch. Three of the states surveyed are accessible only by boat. Transportation to the collecting areas is also a problem for the women who have poor access to boats. Storage and processing facilities (i.e., freezers and smokehouses) are rare in the villages where this study was conducted. Many women would like to market more than they do but lack the facilities to store and prepare quality seafood products. Most of the species women collect, sea cucumbers in particular, have low market value. In addition, there are no set prices per pound for invertebrate species and women are paid inconsistent prices by the bag, jar or bottle.

Environmental problems, such as fishing pressure on the limited resources of the increasingly populated areas around Koror and habitat loss throughout the surveyed states due to development and reef dredging activities may be affecting the resources women collect. Ninety-three percent of the women interviewed were able to name at least one species that is harder to find now than it was sometime in the past. Larger scale operations that harvest

giant clams and deep water sea cucumbers for export as *beche de mer* may also impact the nearshore resources women rely on.

The following recommendations are proposed to aid the development and management of the nearshore resources collected by women:

- (1) Initiate a year-long fisheries development project to continue the work of this preliminary three-month study to: (a) verify the survey results and determine those species most suitable for the project through a more intensive restaurant and market survey; and (b) select and assist one or two women's groups who have shown interest and initiative in developing their processing and marketing skills to develop a higher quality product at more competitive prices.
- (2) Conduct a survey of the nearshore marine resources and habitats around Palau to determine the status of the stock of invertebrate species. This survey should include a survey of the users of those resources as well.
- (3) Develop a handbook of the invertebrate species found around Palau at low tide to be used in community outreach and education programs, in school science programs and by visiting and local scientists. This handbook could also be offered for sale to tourists and other visitors.

## INTRODUCTION

Women are significant contributors in an enterprise that has traditionally been viewed as the domain of men -- Palauan fisheries. Groups of women are successfully proving their worth in this fishery. In the past year, a local women's group received a grant to buy a boat and build a market from which to sell their catch. Another group of women started a market that sells only produce grown and seafood collected and processed by women. A women's fishing derby attracted dozens of boatloads of women wielding poles, lines and hooks. Outside support for these activities is also growing -- a regionwide study of the role of women in fisheries sponsored by the South Pacific Commission is underway.

Fishing is generally thought of as men's work, as the term "fisherman" implies. The collection of other marine species, especially invertebrates that can be collected from the reef flat at low tide, has been largely ignored (Chapman, 1987; Matthews, 1991). The collection of these species is often the responsibility of women, and sometimes, their children. Little has been written about women's collecting activities in the tropical Pacific in general, and Palau is no exception. Several anthropologists and other scientists have studied the structure and knowledge of traditional Palauan society, placing more emphasis on the importance of the men's catch of fish, lobster and large crabs than on those species collected by women and children (Johannes, 1981). Kramer's extensive documentation of Palauan life in the early 1900s mentioned some of the species collected by women and children. However, little else has been documented since then. Women have been associated with the raising of taro rather than with their catch of marine species. In fact, one author said that Palauan men were more tied to the cycles of nature than women since "the reef, lagoon, and sea were primarily the domain and habitat of men" and the women's activities "were primarily concentrated on the land in the cultivation of taro, an activity that varies little with the seasons" (Klee, 1980). While Klee acknowledges the fact that women "occasionally comb the tidal flats for shellfish, sea urchins, sea cucumbers, and some varieties of small fish" he minimizes this activity considerably. In Palau the cultivation of taro is still a major activity for many women and fishing is more often a job for men. However, it is equally true that many women spend a great deal more time in the water collecting marine species than has been recognized by outside writers. They also have considerable knowledge of the rhythms of this life.

Women were the food producers in traditional Palauan society and as such they had considerable power. Their social and political position was important because of their role as providers (Palau Community Action Agency, 1976). Women prepared the fish men caught. When men caught no fish because of bad weather or other events, the women were the sole providers of food (Smith, 1977). Women farmed the land and produced taro, the staple food in Palau. In addition, they controlled the money. Women had the power to distribute land. Councils of high ranking women selected people to become chiefs; these nominees were then confirmed or rejected by a council of chiefs. Palauans trace their clan history through their mother's family. The most important ties for access to titles, land, position in the clan and access to resources was through relationships through the mother (Margold and Bellorado, 1985).

In the past, women's collecting activities were generally restricted to the inner reef areas accessible by foot or bamboo raft. They usually collected nearshore invertebrates, especially sea cucumbers and molluscs, for family consumption. This activity is called reef gleaning. The mere use of the word "gleaning" minimizes the importance of women's nearshore resource collecting activities. The word connotes the action of picking up leftovers after a harvest, especially those pieces that were not large or important enough to collect the first time. Such collection seems to require little more than a sharp eye and some spare time. In fact, the women interviewed during this study know quite a lot about the species they collect: they know when and where to find particular types of seafood and the collection methods they use are usually more involved than the simple and mechanical process of stooping to pick up the leftovers.

Today with some access to gasoline-powered boats, women have begun to diversify their fishing activities. They are occasionally fishing with lines, nets and spearguns. Women are also beginning to collect species, such as mangrove crabs, that have higher market value than the species they normally collect. However, most women who fish or collect other marine foodstuffs still tend to stay close to shore within the barrier reef.

In recent years the importance of the contribution of women to the fisheries of Pacific island nations has been recognized. Women's and men's fishing domains are slightly different since women tend to collect invertebrate species and process marine food while the men more often catch fish. Development activities that enhance fisheries often ignore the fishing activities of women (Schoeffel, 1985). As a result, women have been left out of the development process until fairly recently. Several studies on the role of women in fisheries have begun throughout the Pacific, especially the regionwide program sponsored by the South Pacific Commission.

The Republic of Palau, Division of Marine Resources initiated a study of the role of women in fisheries partially in response to the growing interest in women's fishing activities and their contribution to the fishery, but for practical reasons as well. A management plan for the inshore fisheries of Palau is underway and will not be complete unless the resources collected by women are taken into account. A significant number of marine species sold in local restaurants and markets could not be traced back to fishermen. In addition, almost nothing is known about the subsistence catches of many species. When only those resources sold in the markets are traced, subsistence catches are not recorded. Although this is not specific to women, collecting fish and shellfish for subsistence purposes, which is a major part of women's fishing activities, was believed to be an important aspect of any inshore fisheries management plan. Nothing, however, had been documented about these aspects of the inshore fishery.

In June 1991, the Women in Fisheries Study began in Palau's Division of Marine Resources. The aim of the study was to document the various fishing, collecting, marketing and processing activities in which women actively participate and to identify areas where problems may be occurring. The study is a preliminary attempt to document the role of women in both commercial and subsistence fisheries to more fully understand the fisheries of



Palau. It is a look through the women's eyes at their role as fisherwomen and the knowledge they have of their resources. Since this is the first report of its kind, it is more descriptive than quantitative. Much more work needs to be done in order to effectively develop and manage the inshore fisheries in Palau in which women play a large role.

## METHODS

The Republic of Palau is a group of islands in Micronesia lying between two and eight degrees North latitude and 131 and 135 degrees East longitude. Surrounded by the Pacific Ocean, it is relatively isolated from larger land masses. The Philippines is 550 miles to the west; Papua New Guinea is 410 miles to the south; and Guam is 815 miles to the northeast (Figure 1).

Palau is an oceanic country. The total land area is about 190 square miles (490 km<sup>2</sup>). In contrast, the area of fishable waters (including mangrove, lagoon and inner and outer reefs) has been estimated to be over 600 square miles (1600 km<sup>2</sup>). The mangrove areas, lagoon and inner reef alone are about 500 square miles (1300 km<sup>2</sup>) (Division of Marine Resources, 1991). The diversity of marine species in this area of the western Pacific is among the highest in the world (Myers, 1989). Fishing and other marine resource gathering activities traditionally have been a way of life for Palauans.

Palau is composed of 16 states (Figure 2). Ten states occupy the largest island Babeldaob. The capital city of Koror is located just south of the island of Babeldaob. Two island states lie to the south (Peleliu and Angaur), one to the north (Kayangel) and two lie about 350 miles southwest (Hatohebei and Sonsorol, the Southwest Islands). Only nine of the more than 200 islands that make up this Micronesian archipelago are populated. Most are tiny, uninhabited uplifted coralline limestone islets, the Rock Islands, located between Koror and Peleliu. The majority of Palau's population is located in southern Babeldaob and in Koror (Table 1).

The aim of this study was to conduct a survey of selected coastal fishing villages in Palau and determine the degree of involvement of women in the fisheries, to identify appropriate development activities to assist women from coastal communities and to identify technical problems involved in the women's activities in subsistence and commercial fishing. The framework of this study is based on the South Pacific Commission (SPC) Terms of Reference (Appendix 1).

The Women in Fisheries Study was conducted from June 23 to September 13, 1991 by a three-person team consisting of a fisheries technician, an assistant from the University of Oregon Micronesia Program and a field assistant. They visited the markets daily for the first three weeks of the study, usually in the morning, to observe and identify marine products being sold. The markets visited were Palau Modekngai Company Inc. (PMCI), Yano and Sons, Oh's Fish and Produce and Blue House markets in Koror. Short, informal interviews of women who brought their harvest to the markets were conducted. Women were also questioned while they were collecting or fishing in the lagoon and nearshore areas. These

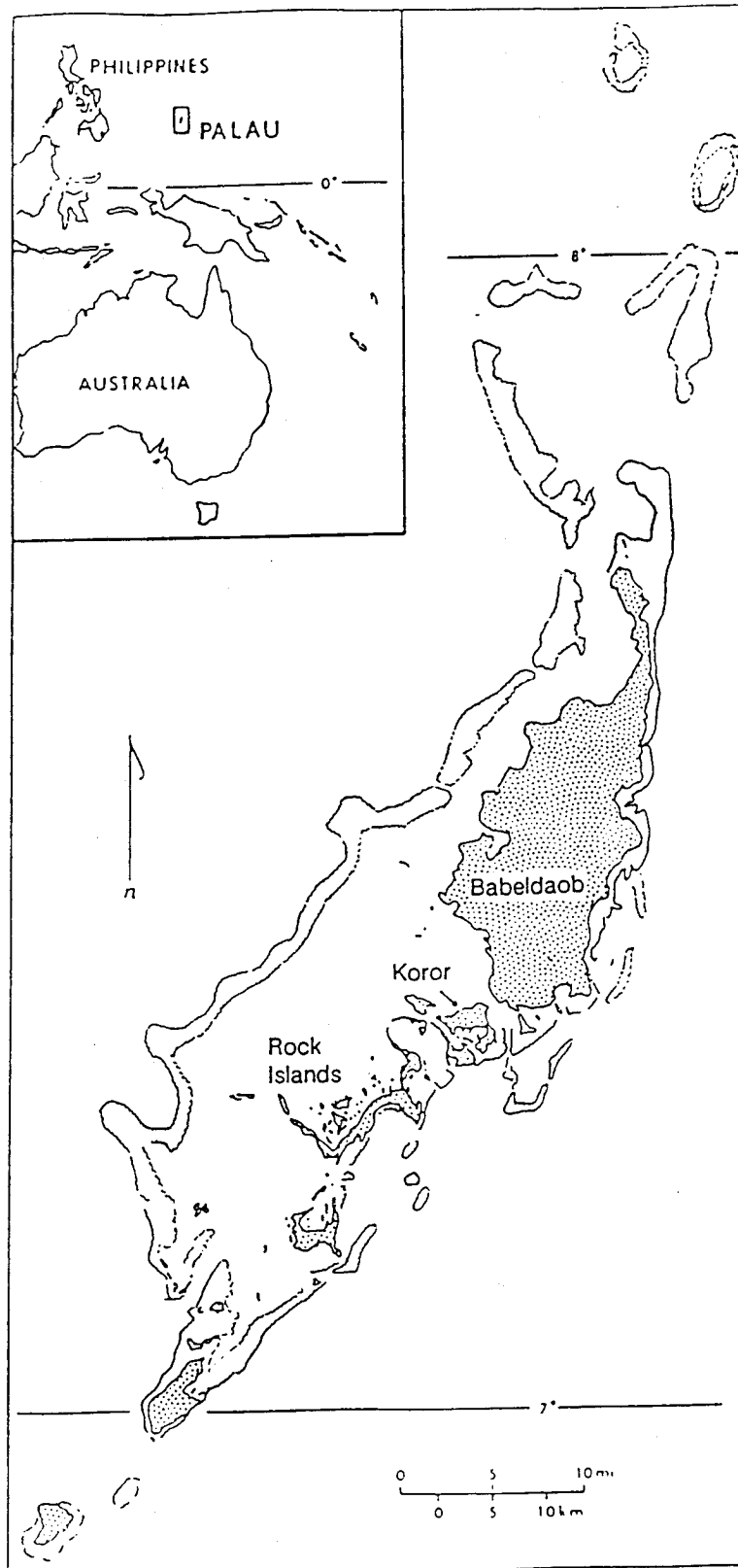


FIGURE 1. Map of Palau.

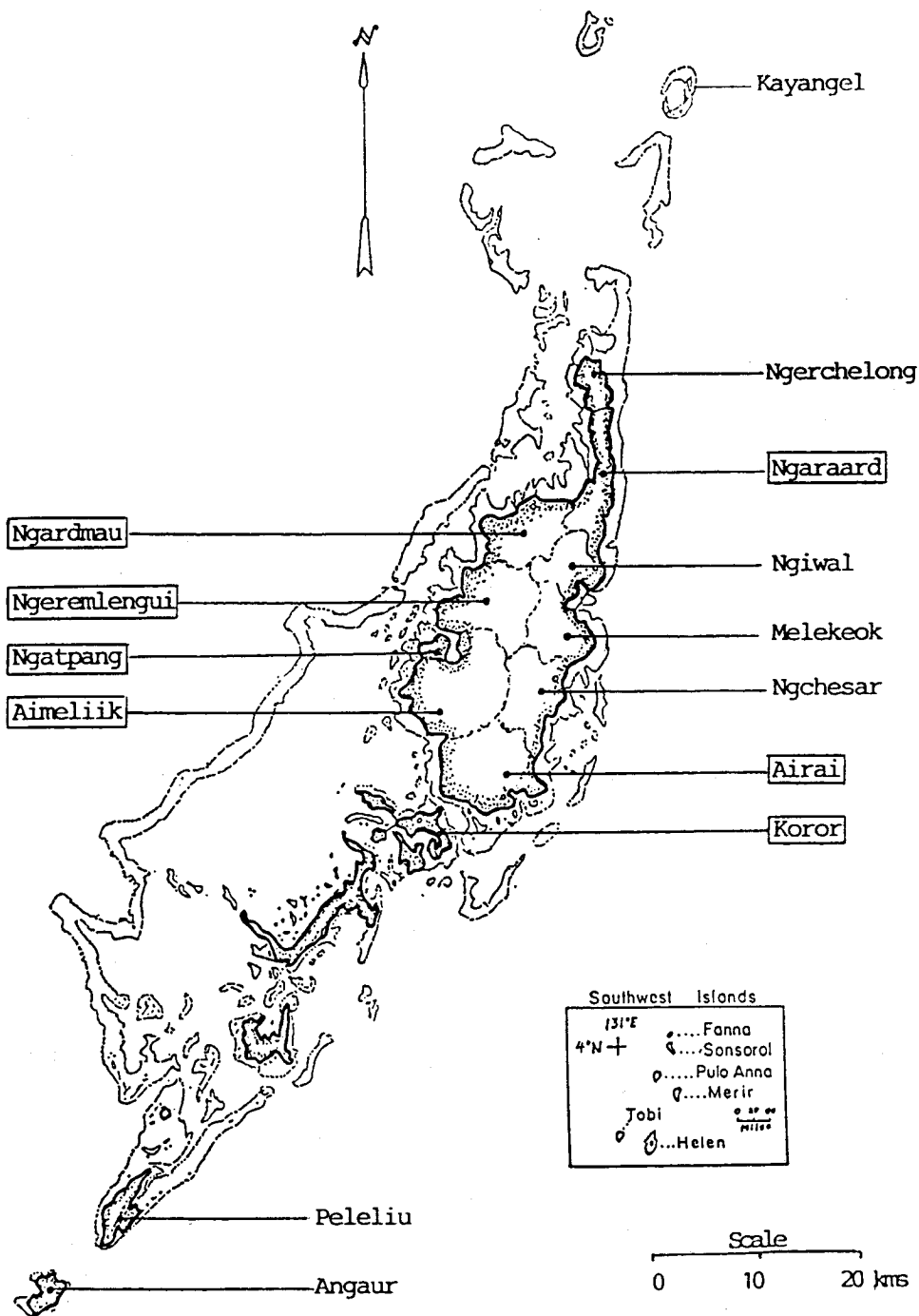


FIGURE 2. Map of Palauan states showing those states where the Women in Fisheries survey was conducted (states are boxed).

informal interviews helped identify areas to include in the more intensive survey. Inquiries and field identification of marine resources established a preliminary list of species to aid identification and documentation of organisms collected by women.

As a result of the market surveys and the existing data compiled by the staff of the Division of Marine Resources of three markets in Koror, namely Yano and Sons, Palau Modekngai Company Inc. and Oh's markets, seven states were chosen for the survey. These states were Aimeliik, Ngatpang, Ngeremlengui, Ngardmau, Ngaraard, Airai and Koror (Figure 2). The states were selected because of (1) the frequency of women bringing their fish and seafood to markets in Koror; (2) the significance of reef, lagoon, shore and mangrove areas and their resources (Table 2); and (3) the accessibility to the villages for the survey team by either boat or car, to accommodate the three-month duration of the study.

TABLE 1. Population of Palau, 1986.

State	Women				Men	Total
	(0-19)	(20-49)	(50-75+)	All ages		
Koror	1832	1548	555	3935	4208	8143
Airai	197	163	75	435	464	899
Peleliu	114	90	59	263	273	536
Ngaraard	132	53	35	220	193	413
Ngeremlengui	61	43	24	128	170	298
Ngerchelong	58	34	43	135	140	275
Ngchesar	64	36	32	132	139	271
Aimeliik	58	35	23	116	147	263
Melekeok	45	35	28	108	128	236
Ngatpang	56	24	14	94	120	214
Ngiwal	44	23	26	93	121	214
Angaur	53	30	20	103	106	209
Ngardmau	25	23	17	65	92	157
Kayangel	31	14	7	52	60	112
Sonsorol	16	2	3	21	21	42
Hatohobei (Tobi)	5	4	3	12	23	35
Rock Islands	0	1	1	2	4	6
TOTAL				5914	6409	12323

Source: Office of Planning and Statistics (1987)

TABLE 2. Estimated nearshore collecting and fishing area (km<sup>2</sup>) by state.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem- lengui	Total
Mangrove	3	8	2	3	7	6	4	33
Inner reef	8	23	19	23	14	3	8	98
Lagoon	55	30	500	24	23	15	15	662
Total	66	61	521	50	44	24	27	793

Source: Division of Marine Resources (1991)

A questionnaire was developed to interview women in fisheries (see Appendix 2). It included detailed questions about the roles women play in fishing or collection of marine resources. The questions included the methods the women use and what is collected, the efforts and frequency, when they go out collecting, the number or quantity of each catch and what the catch is used for. It included questions about the marketing of their catch, how much and how often they sell and where the catch is sold, and whether or not they process and market their husbands' products. The women were asked for their own view of their role and any changes they see in the fishing environment that may affect their access and utilization of the resources. They were also asked if there are any problems they encounter in their fishing for subsistence and marketing and what assistance they need.

Upon completion of the draft survey questions, the Women in Fisheries team conducted a trial survey at Aimeliik State. The survey was slightly altered as a result of this test to clarify some questions and include others that might be important. As the survey team found pertinent questions that needed to be asked to clarify the women's roles in Palauan fisheries, the questionnaire evolved as the study progressed. Consequently, those interviews that occurred towards the end of the survey (especially those in Koror and Airai) are more informative than some of the earlier surveys. For instance, questions about how often the families of fisherwomen eat what they collect and the women's estimate of their monthly or yearly income from fishing and gleaning were asked only in the states that were surveyed at the end of the study -- Koror and Airai.

In order to collect the most information about the activities of women in fisheries, the survey team attempted to locate those women who were known by their neighbors or friends to be actively fishing and/or gleaning. Respondents were also accounted for through the purchase receipts and return sheets from the Koror markets. When these women were unavailable because they were out collecting, tending taro patch or not home, the survey team interviewed any woman who was home during the time of the survey and who agreed to be interviewed. The team obtained from them names of other women in the village that could be approached and interviewed. Unfortunately, those women from Koror and Ngatpang who are known locally to sell their marine catches were not at home when the survey team visited those

TABLE 3. Women interviewed by state, age group and marital status.

State	Total # of Women	Women Interviewed						
		# Inter-viewed	Age Group				Status	
	Age 20+		(20-30)	(31-40)	(41-50)	(50+)	Married	Single
Airai	248	8	0	4	1	3	8	0
Aimeliik	58	7	1	0	4	2	7	0
Koror	2103	12	1	6	4	1	8	4
Ngaraard	88	12	1	2	2	7	11	1
Ngardmau	40	7	0	0	0	7	5	2
Ngatpang	38	3	0	1	0	2	3	0
Ngeremlengui	67	5	1	1	1	2	5	0
Total	2642	54	4	12	12	25	47	7

states. A total of 54 women were interviewed from the seven states (Table 3). Individual interviews generally lasted one to two hours. The survey was written in English but conducted in Palauan since the women interviewed were more comfortable with that language.

#### Note on Palauan Names

The Palauan language contains terms that describe different species, habitats in the lagoon and on the reef, tides and collection methods. The Palauan terms appear in bold face in the text. (Note that the "ch" is not pronounced as in English; it denotes a glottal stop in Palauan.) A list of the Palauan names for invertebrates and fish encountered during this survey is given in Appendix 3 and a glossary of Palauan terms are listed in Appendix 4. These terms may differ from state to state, so some of the references cited may contain different terms. The study team tried to compile those terms most frequently used by the women who were interviewed.

Older Palauan women can identify a great many invertebrate and fish species. During the course of the surveys they frequently used terms that many of the younger people did not use. It was often difficult to find another woman who knew what was referred to by some of the words. There are two main reasons for this discrepancy. Often the reason was simply that someone from another state or village used a different term for the same species. The second reason was that some species that used to be collected from an area or from Palau as a whole are no longer collected. This will be covered in more detail in the Discussion.

Scientific identification of many of the Palauan species names often proved difficult. Whereas a few authors have identified many of the fish species collected by Palauans by their scientific names and compiled lists matching Palauan and scientific names, little has been written about the Palauan taxonomy of marine invertebrates (Johannes, 1981; Helfman and Randall, 1973; Perron *et al.*, 1983). One exception is a list of molluscs compiled in 1943 by a Japanese scientist working at the Palao Tropical Research Station which operated from 1914 to 1945. Scientific identification of many of the species mentioned by the Palauan women interviewed proved difficult. We had to rely on descriptive information that was not sufficient to positively identify such species. While the purpose of this study was not so much the documentation of species collected by women as it was a study of their roles in the fisheries of Palau, this difficulty indicates a need for more comprehensive documentation and identification of Palauan marine invertebrates.

## RESULTS

The response to the Women in Fisheries survey was encouraging. Only rarely did women not want to be interviewed. In fact, almost everyone who was approached was eager to talk about their fishing and collecting activities. Although the women were usually busy watching children, cooking, preparing produce or seafood for market or working in the taro patches, they graciously gave the hour or more that it took to answer our questions. The surveys provided a wealth of information. The questions covered four main subject areas: (1) fishing and collecting methods for various invertebrate and fish species; (2) commercial activities; (3) processing methods; and (4) problems and changes affecting these activities and species. The significance of subsistence and commercial fisheries activities and the value of the women's role in the collection of marine resources became apparent through these questions also.

### Women's Fishing and Collecting Activities

Women use a variety of fishing and collection methods in Palau; those techniques are listed in Table 4, in order of their popularity and use. Women collect a wide variety of species from the waters around Palau. Most are invertebrates and can be collected while walking along the nearshore areas at low tide. The invertebrate species collected by most Palauan women interviewed are listed in Table 5. The Palauan names are given in parentheses. The species listed in this table are those that most women collect. They are *not* necessarily the species collected most often or in the greatest abundance. Such species are listed in Table 6. A more thorough, but by no means complete, list of species collected by women appears in Appendix 3.

### REEF GLEANING

At low tide, women and occasionally children can be seen wading in the water, plastic and aluminum basins trailing behind them on a string. They stop to collect sea cucumbers, clams, crabs, urchins and whatever other species they want to bring home to their families. This collecting method, known throughout the Pacific as reef gleaning, is by far the most common form of fishing activity for Palauan women. Ninety-six percent of the women surveyed for this study engage in some form of reef gleaning. Women glean for market as well as for subsistence purposes. Often, the species that are collected to be sold differ from those that are collected for subsistence purposes only. A small amount of almost all commercial catches are kept for food for the family as well as for giving to relatives and friends. The species most often collected by gleaning by the women interviewed are listed in Table 7.



TABLE 4. Seafood collection methods used by Palauan women. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraard (n=12)	Ngardmau (n=7)	Ngatpang (n=3)	Ngerem- lengui (n=5)	Total (n=54)
General gleaning	100	100	92	100	86	100	100	96
Sea cucumber collection (olengimes)	71	100	92	100	86	100	80	91
Mangrove clam collection (mengduul)	71	75	50	83	71	100	100	74
Hook & line fishing	57	88	75	67	43	0	80	65
Sea cucumber collection (omat a irimd)	71	88	75	25	43	67	40	57
Collection at night (meluich)	57	50	42	58	14	0	60	44
Seine net (kesokes)	29	38	25	17	0	0	20	20
Surround net	0	25	33	17	0	0	20	17
Land crab collection	14	0	17	25	0	0	0	11
Spearfishing	0	0	8	8	0	0	0	4
Cast net	0	0	0	8	0	0	0	2
Coconut crab collection	0	13	0	0	0	0	0	2
Mangrove crab collection	0	13	0	0	0	0	0	2

TABLE 5. Invertebrates typically collected by Palauan women. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraard (n=12)	Ngardmau (n=7)	Ngatpang (n=3)	Ngerem- lengui (n=5)	Total (n=54)
<b>ECHINODERMS</b>								
<i>Stichopus variegatus</i> (ngimes)	100	100	100	92	86	100	80	94
<i>Actinopyga miliaris</i> and <i>A. echinites</i> (cheremrum)	100	100	75	75	86	100	80	85
<i>Holothuria scabra</i> (molech)	86	88	58	83	71	100	20	72
<i>Holothuria sp.</i> (irimd)	71	88	67	25	29	67	40	54
<i>Holothuria verrucosa</i> (sekesakel)	43	88	33	58	14	0	0	41
<i>Tripneustes gratilla</i> , <i>Hemicentrotus pul-</i> <i>cherrimus</i> , <i>Strongylo-</i> <i>centrotus pileolus</i> (ibuchel)	29	63	17	58	71	67	40	46
<b>MOLLUSCS</b>								
<i>Tridacna crocea</i> (oruer)	100	100	92	67	71	67	80	83
<i>Anadara spp.</i> and <i>Bar-batia reeveana</i> (kikoi)	71	88	83	92	86	100	60	83
<i>Anodonita edulenta</i> (ngduul)	100	88	50	83	71	100	100	80
<i>Tridacna spp.</i> (kim)	86	88	67	92	71	33	80	78
<i>Cypraea tigris</i> (buich)	57	100	67	67	43	67	40	65
<i>Lambis lambis</i> (sang)	57	100	67	67	43	67	40	65
<b>CRUSTACEANS</b>								
<i>Portunus pelagicus</i> (kmai)	100	75	50	50	43	100	0	57

TABLE 6. Invertebrates collected in the greatest numbers by Palauan women. Numbers represent percent of responses. Numbers after slash indicate percent of those who collect for subsistence purposes only.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraar. (n=12)	Ngardm. (n=7)	Ngatpang (n=3)	Ngerem. (n=5)	Total (n=54)
<b>ECHINODERMS</b>								
<i>Stichopus variegatus</i> (ngimes)	100/29	88/43	100/75	92/36	100/43	100/33	80/25	94/45
<i>Actinopyga miliaris</i> and <i>A. echinites</i> (cheremrum)	100/14	100/13	58/100	83/30	86/17	100/33	80/25	85/33
<i>Holothuria sp.</i> (irimd)	71/40	100/25	67/75	17/50	29	67/50	40/50	54/45
<i>Holothuria scabra</i> (molech)	43	38/67	8/100	0	0	33	20	17/33
<i>Diadema setosum</i> (choalech)	0	0	17/50	0	0	0	0	4/50
<i>Bohadschia argus</i> (meremarech)	0	0	8/100	0	0	0	0	2/100
Short-spined urchins (ibuchel)	0	0	0	0	0	0	20/100	2/100
<i>Holothuria verrucosa</i> (sekesakel)	0	13	0	0	0	0	0	2
<i>Holothuria fuscopunctata</i> (delal a molech)	0	13	0	0	0	0	0	2
<b>MOLLUSCS</b>								
<i>Anodonita edulenta</i> (ngduul)	86/67	88	50/50	83/20	86	100/33	100	80/23
<i>Tridacna spp.</i> (kim)	71/60	88	50/33	75/22	57/25	0	60/33	63/26
<i>Tridacna crocea</i> (oruer)	86/17	88/14	92/18	0	14	33	60	54/14
<i>Atactodea striata</i> and <i>A. striata f. glabrata</i> (chesechol)	0	0	0	42/100	0	0	0	8/100
<i>Anadara spp.</i> and <i>Barbatia reeveana</i> (kikoi)	0	0	17/100	0	0	0	40	7/50
<i>Nucula rugosa</i> (delbekai)	0	0	0	25/100	0	0	0	6/100
<i>Nerita maxima</i> and <i>N. undata</i> L. (delsangel)	0	0	8/100	0	0	0	0	2/100
<b>CRUSTACEANS</b>								
<i>Cardisoma hirtipes</i> and <i>C. carnifex</i> (rekung)	0	13	8/100	50/33	0	0	0	15/38
<i>Scylla serrata</i> (chemang)	14	13	0	0	0	0	20	6
<i>Birgus latro</i> (ketat)	0	25	0	0	0	0	0	4

TABLE 7. Invertebrate species most often collected by women while reef gleaning.

Commercial and subsistence	Subsistence only
Sea cucumbers: cheremrum molech sekesakel	Urchin (ibuchel)
	Cowrie (buich)
	Spider shell (sang)
Molluscs: kim (giant clam) oruor (giant clam) kikoi (ark shell)	Rock crab (kmai)

### Sea cucumbers

Both of the sea cucumbers, *Actinopyga miliaris* and *A. echinites*, are referred to as **cheremrum** in Palauan. The dark species is occasionally called **ngellau cheremrum** and the lighter, or reddish, species is called **ngemolei cheremrum**. Palauan women look for the five anal teeth in *A. miliaris* that distinguish it from **choas** (*Holothuria atra*), a sea cucumber the Palauans do not eat (see Appendix 3). **Cheremrum** may be found under rocks during the day or in the seagrass beds. It is found throughout Palauan waters, but of the states surveyed in this study, the largest numbers were collected from Aimeliik (Table 8). The fewest numbers were collected in Koror. This may be due to the fact that Koror's catch is entirely used for subsistence. Alternatively, the resource may have been depleted by the large population around Koror. These animals are collected from reef flats and seagrass beds at low tide.

When women collect **cheremrum** for subsistence, only small and tender ones are collected. Those who collect for commercial purposes spend two to three hours collecting all they can find and are able to clean before the sea cucumbers disintegrate or melt. A sack, or an average of fifty pounds, of sea cucumber is collected for markets. The sea cucumbers are prepared with a cleaning process using salt or fire residue to get rid of the thin slimy covering of the skin. They are then cut lengthwise and the intestines are thrown away. After a salt-water rinsing, the sea cucumber is sliced into small chewable sizes. They are eaten raw with lemon or amra leaves and fruits (**titimel**). Sometimes, when they are too tough for eating, salt is used as a tenderizer. Another processing method is to leave them wrapped overnight and pressed under some heavy objects to ensure a softer texture. They are sold in small jars or plastic sandwich ziplock bags. Since salt is used for the cleaning process the product is well preserved for two or more days without refrigeration, guaranteeing a good market quality. This is a popular animal: 85 percent of the women interviewed collect it, and 33 percent of those collect only for subsistence.

TABLE 8. Amount of the sea cucumber *Actinopyga miliaris* and *A. echinites* (cheremrum) collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem-lengui	Average
Average catch (in pieces)	236	51	37	179	131	218	198	150
Time spent (hr)	2	2	2	2	2	3	2	2
#times/month	3	3	2	2	3	3	3	3
%sold	90	78	0	82	90	88	92	74
Catch/unit effort (hr)	118	24	19	81	66	73	86	68

TABLE 9. Amount of the sea cucumber *Holothuria scabra* (molech) collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngatpang	Ngerem-lengui	Average
Average catch (in pieces)	93	37	30	100	100	72
Time spent (hr)	2	1	1	1	1	1
#times/month	5	2	2	2	1	2
%sold	84	36	0	90	0	42
Catch/unit effort (hr)	43	37	30	100	100	66

**Molech**, *Holothuria scabra*, is collected for subsistence as well as for commercial purpose. This sea cucumber is sand to black in color and found in silty sand, often near estuaries and in seagrass beds. When the tide is rising, this sea cucumber emerges from the sand and is easy to find within the seagrass bed and soft sandy bottom close to the mangroves. The stomach linings of this sea cucumber are eaten. Most people prefer it steamed or cooked slightly in boiling water. Overcooking will lose the quality. The young ones are usually tender and are sometimes eaten raw with the skin removed by scraping or peeling. Since these sea cucumbers require cooking before they are brought to the markets in Koror, only women from Aimeliik, Ngatpang and Airai sell them often. Some women interviewed from states farther from Koror, especially from Ngardmau and the west coast of Ngaraard said that they cannot sell this sea cucumber because there is no way for them to preserve the half-cooked product, which deteriorates easily. They collect it for subsistence only. This sea cucumber is collected by 17 percent of the women surveyed. One-third of the women who collect it do so for subsistence purposes only. None of the women interviewed who collect

this species from Koror and Ngeremlengui market it (Table 9). Most of the commercial catch comes from Ngatpang and Aimeliik. Although women in Ngaraard and Ngardmau also collect **molech**, none listed it as one of their major catches.

**Sekesakel**, *Holothuria verrucosa*, is collected mainly for subsistence. The stomach linings of this sea cucumber are eaten raw after the intestines are removed. Women prefer it soaked in fresh water overnight, which causes the linings to expand and easily come off. Another species called **chederngor** is eaten raw after the skin is scraped. It is collected with **sekesakel**. In Airai, three women were interviewed who collect **sekesakel** when someone specifically asks them to (a "special request"), and one woman who sells it in the market.

### Molluscs

**Giant clams**. There are seven species of giant clams (*Tridacna spp.* and *Hippopus hippopus*) found in Palau. Palauans have names for six of these species (see Appendix 2) but the women interviewed only used two: **kim** and **oruer**. **Kim** is a general term for the free-living giant clams (usually *Hippopus hippopus*), and **oruer** refers to the smaller species of clams that lives in holes in rocks or coral (*Tridacna crocea*).

These clams are sold in markets raw or with slices of lemon. The clam meat can also be dipped quickly in boiling water (a process called **omur**). Occasionally the meat is marinated in coconut milk. Sixty-three percent of the women surveyed collect **kim**, 26 percent of those for subsistence. Fifty-four percent of the women collect **oruer**, 14 percent of those for subsistence. Women collect the most **kim** from Airai (Table 10) and the most **oruer** from Ngeremlengui (Table 11). Both species are more important for subsistence than for income in Koror. The smallest numbers of **kim** are collected in Ngaraard and the smallest numbers of **oruer** are collected in Koror. Giant clams are often collected for important events, such as funerals.

TABLE 10. Amount of giant clams, *Tridacna spp.* and *Hippopus hippopus* (kim), collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngerem- lengui	Average
Catch (in pieces)							
Good	44	78	54	20	47	77	53
Average	24	41	27	26	37	68	37
Time spent (hr)	2	2	3	3	2	4	3
#times/month	1	3	3	3	2	6	3
%sold	42	71	36	64	62	80	59
Catch/unit effort (hr)	12	17	10	9	19	17	14

TABLE 11. Amount of *Tridacna crocea* (oruer) collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngard-mau(a)	Ngat-pang(a)	Ngerem-lengui	Average
Average catch (in pieces)	65	51	48	50	70	135	70
Time spent (hr)	3	3	3	2	4	4	3
#times/month	2	3	3	1	6	7	4
%sold	72	74	27	71	100	96	73
Catch/unit effort (hr)	26	19	16	25	18	31	23

a These figures are based on the catch of one woman from either state.

**Ark shells.** Ark shells (*Anadara spp.* and *Barbatia reeveana*, **kikoi**) are clams that live just under the sand, above the layer of mud close to mangrove areas. Women walk along, feeling for **kikoi** with their toes. Some women can spot the hole the clam's siphon makes in the sand and then collect the clam with their feet. Others stoop over and feel in the sand/mud with their hands. These clams are not collected as often as other molluscs except in Ngeremlengui. The catch in the two states where women collect these clams in significant amounts is given in Table 12. Women from all other states also collect these clams but none mentioned them as one of their more important catches. The differences between subsistence and commercial gleaning are clear in the data in Table 12. The women who collect ark shells from Koror do so solely for subsistence, while the women who collect them in Ngeremlengui do so mostly for marketing. The difference in the numbers collected, the time spent and the number of times per month that these women collect is obvious. All are much greater for the marketed catch than for the subsistence catch.

TABLE 12. Amount of ark shells, *Anadara spp.* and *Barbatia reeveana* (kikoi), collected by women. Numbers represent state averages.

	Koror	Ngeremlengui	Average
Catch (in pieces)			
Good	25	550	288
Bad	13	375	194
Average	20	450	235
Time spent (hr)	2	5	3
#times/month	2	10	6
%sold	0	90	45
Catch/unit effort (hr)	13	90	52

Nut clam. Women occasionally collect a small sand clam that they call **chesechol**. This species (*Atactodea striata*) lives on sandy beaches at the level where waves break. These clams are an important subsistence species for some of the women living on the east side of Ngaraard where there are long stretches of sandy beaches. Women can collect a gallon (several hundred) of these clams in a few hours. Women usually collect this species when they cannot go further into the water because of storms, pregnancy or because they have small children to watch.

### Urchins

Several species of sea urchins are collected, especially for subsistence use (see Table 6). The short-spined urchins called **ibuchel** in Palauan (*Tripneustes gratilla*, *Hemicentrotus pulcherrimus* and *Strongylocentrotus pileolus*), are generally found in large numbers with large ripe gonads in June. This is when the women collect as many as they can find. Other species of urchins are rarely collected because of the effort required to prepare them for consumption. For example, the long-spined urchin (*Diadema setosum*, **choalech**) takes an entire day to collect and process. Only one woman interviewed collects this species; however, she said she cannot collect enough of them to meet the demand of people who want to buy them from her. This urchin prefers areas where currents are strong. Several people search for an area where urchins are abundant. Up to 1000 are collected with tongs and placed in a large chicken wire basket with a bamboo handle on either side. The filled basket is shaken under water for several hours until the spines are broken off. Care is taken to make sure the spines float downstream with the current away from those shaking the basket. The five gonads ("meat") from each of 12 to 18 urchins are placed in one large urchin shell (or test) and sold for \$2.50. The best time to collect urchins is the day or two before and after the full moon when the gonads are "fat."

Reef gleaning involves the collection of many different species at a time, but often women wish to collect only one species. In addition, some species require special methods for their collection, and it is more efficient for women to focus on collecting just one species. As a result, there are specific Palauan terms for several specialized methods of collection that may otherwise be considered gleaning.

### OLENGIMES: SEA CUCUMBER COLLECTION

When women focus on the collection of the sea cucumber *Stichopus variegatus* (**ngimes**), the method is termed **olengimes**. **Ngimes** are found in seagrass beds within the inshore areas. The sea cucumber is brownish or green with a slimy texture. It is also collected for bait by men and women, usually young people. The Palauan name, **ngimes**, means "to stretch", which is exactly what this sea cucumber does if it is held too long. For use as food, **ngimes** is usually collected during the morning low tide called **bor**. Since the intestines are the parts used, **ngimes** are collected before they have eaten and when the intestines are still clean and free of sands. The sea cucumber is cut open or cut in two, intestines are removed and the skin is thrown back in the water to regenerate. Women collect the intestines which are sold in markets in jars by the pint or quart, or in plastic ziplock bags. Usually, the intestines of 20 animals are needed to make one pint.



The women know that both halves of the cut sea cucumber will regenerate into a complete small organism. In areas where they are often collected, there are many small individuals. Some women believe that **ngimes** taste better if they have come from animals recently cut in half. If the **ngimes** from an area have never been collected by this method, some people said they have a bad aftertaste. If this is the case, collecting this species on a regular basis and returning the opened animals to the sea is practically a farming operation.

Ninety-four percent of the women surveyed collect this sea cucumber. Forty-five percent of them collect it for subsistence only. One woman commented that this species used to be popular only among the older people, but now even the young people like to eat it as well. Most of the **ngimes** sold in Koror's markets are from Ngeremlengui, Ngatpang, Ngardmau and Ngaraard as shown in Table 13. This table also shows that the least numbers are collected in Aimeliik and Koror, with Koror's catch being used mostly for subsistence purposes.

TABLE 13. Amount of the sea cucumber *Stichopus variegatus* (ngimes) collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem- lengui	Average
Average catch (in pieces)	78	100	83	116	114	133	190	116
Time spent (hr)	2	1	2	2	2	2	3	2
#times/month	4	3	2	3	2	2	2	3
%sold	70	72	29	75	88	84	87	72
Catch/unit effort (hr)	49	71	46	53	71	78	63	62

#### OMATAIRIMD: SEA CUCUMBER COLLECTION

**Omatairimd** is the method used to collect the sea cucumber **irimd** (*Holothuria sp.*). This species is collected during low tide within the seagrass bed where the plants *Enhalus sp.* and *Halimeda sp.* are common. Women bring a bucket, fresh water and salt to the gleaning area. After collecting the amount they need, the women keep the sea cucumbers in seawater most of the time to avoid disintegration. They are then put in a sack or basket and salt is added (women traditionally used **chab** or fire residue instead of salt) for the cleaning process. The basket is shaken and rubbed against a rock to clean and remove the slime covering the skin. When the sea cucumbers turn white, they are clean and taste better. They are rinsed in seawater and put in a bucket of fresh water prepared with amra fruits, *Spondias pinata* (**titimel**) or vinegar.

TABLE 14. Amount of the sea cucumber *Holothuria sp.* (irimd) collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem- lengui	Average
Average catch (in pieces)	98	99	136	105	125	125	92	111
Time spent (hr)	2	2	2	3	3	2	5	3
#times/month	1	2	1	1	2	2	7	2
%sold	70	51	13	48	100	40	45	52
Catch/unit effort (hr)	54	50	68	35	42	63	18	47

Fifty-four percent of the women interviewed collect this species for both subsistence and marketing; 45 percent of those for subsistence purposes alone. Most of these sea cucumbers are collected by women in Koror who sell only 13 percent of the catch (Table 14). Those that are sold in markets come from Ngardmau.

#### MENGDUUL: MANGROVE CLAM COLLECTION

The thin-shelled mangrove clam (*Anodonita edulenta*, **ngduul**) lives a few feet deep in the mud in and around mangrove forests. Women go out to collect this species mostly during the neap tides, **mengeai**. They are submerged in the mud and water up to their chest and feel for the clams with their feet. When the tide is too low, the mud is not wet enough to dig in easily. So when the women search for mangrove clams at low tides, they dig a pool within the mud. This allows some water to flow into the area, which makes the mud more manageable. The women can then wade inside the pool to start feeling for the clams with their feet.

The women usually go in groups of two to five to **ongduoll**, the gleaning areas for this species. The best mangrove clam spots are considered to be **dermetaoch** (small inlets in the mangroves), **lalou** (edge of the mangroves) and **uet** (pools by the mangroves) in some areas near where the seagrass grows. The mangroves at Ngesaol in Koror contain all three **ongduoll**, which is rare in other areas around Palau. For conservation reasons the women will collect on one side of the spot, working their way out or in depending on the current. If the tide or current is coming in they go all the way inside (**uchul a ducher**) and collect as they move out. They do this so the ungleaned areas will not be disturbed by heavy sediments. The next time they come to the previously worked area, they collect from the undisturbed areas.

TABLE 15. Amount of mangrove clams, *Anodonita edulenta* (ngduul), collected by women. Numbers represent state averages.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem- lengui	Average
Catch (in pieces)								
Good	167	274	175	180	308	170	320	228
Bad	22	51	50	52	137	40	94	64
Average	91	153	99	95	200	100	140	125
Time spent (hr)	5	5	4	6	7	6	5	5
#times/month	1	4	3	3	5	2	9	4
%sold	43	78	50	77	100	78	66	70
Catch/unit effort (hr)	18	33	25	17	30	18	29	24

Women can tell if an area is already gleaned by (1) disturbed and uprooted mangrove roots, (2) bottom or mud is too soft, and (3) fresh dead shells are seen or picked up. When they find these disturbances they move to another location. Usually mangrove clams take a few months to reach the marketable size, so women wait three to six months before returning to an area.

Mangrove clams are a major commercial species. All local markets, as well as several restaurants, buy and sell them. Generally clams larger than 1.5 inches are sold to local fish and produce markets and restaurants; smaller clams are kept for family use. Fewer clams are collected in Ngaraard and Ngatpang. Mangrove clams are collected mostly by older women (forty years and over). The most mangrove clams are collected in Ngeremlengui, Ngardmau and Airai. All interviewed women from Ngardmau who use this method sell their catch. Eighty percent of the women interviewed collect this clam, with 70 percent of the catch marketed commercially.

## FISHING

In addition to invertebrates, a number of women catch fish. In most societies, men are more often associated with fishing (as the term "fisherman" implies), and in Palau this is no different. Palauan women, however, are beginning to capitalize on the fish resources of the rich oceanic waters around their islands. A few women own their own boats. However, most of the women who fish accompany their husbands for fishing expeditions. Those species of fish most often mentioned by the women interviewed are listed in Table 16. It was difficult for the women to determine how much of each species was collected because they generally collect more than one species at a time and treat the catch as a whole. The survey, therefore did not elicit quantitative data for the fish catch.

TABLE 16. Fish most often caught by Palauan women. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraard (n=12)	Ngardmau (n=7)	Ngerem. (n=5)	Total (n=54)
<i>Lethrinus nemata canthus</i> , <i>L. obsoletus</i> (chudech)	57	88	58	33	0	20	43
<i>Anyperdon leucogrammicus</i> , <i>Epinephelus maculatus</i> , <i>E. tukula</i> , <i>E. dyctiophelus</i> , <i>E. poecilnotus</i> , <i>E. summana</i> , <i>E. merra</i> , <i>E. microdon</i> , <i>E. fuscoguttatus</i> (temekai)	43	63	42	33	0	20	33
<i>Lutjanus gibbus</i> (keremlal)	43	63	42	25	0	20	31
<i>Siganus canaliculatus</i> , <i>S. fuscescens</i> (meas)	57	50	42	25	0	0	30
<i>Siganus guttatus</i> ( <i>lineatus</i> ) (klsebuul)	43	50	42	17	0	0	26
<i>Choerodon anchorago</i> , <i>C. azurio</i> (budech)	0	63	42	0	0	0	19
<i>Lethrinus haematopterus</i> , <i>L. mahsena</i> , <i>Gymnocranius japonicus</i> , <i>Pristopomoides sieboldii</i> , <i>P. filamentosus roseus</i> (metengui)	29	38	17	8	0	20	17
<i>Lethrinus variegatus</i> , <i>L. microdon</i> , <i>L. lentyan</i> (mechur)	14	63	17	0	0	20	17
<i>Lethrinus miniatus</i> , <i>Sparus miniatus</i> (melangmud)	14	50	17	8	0	20	17
<i>Scarus harid</i> , <i>S. longiceps</i> , <i>Hipposarus longiceps</i> (ngiaoch)	14	50	25	8	0	0	17
<i>Lutjanus bohar</i> (kedesau)	0	13	25	17	0	0	11
<i>Solopsis</i> sp. (chibars)	0	25	33	0	0	0	11
<i>Dasyatis melanospila</i> , <i>D. kuhlii</i> , <i>D. bennetti</i> (rrull)	14	38	8	0	14	0	11
Assorted fish	29	0	25	50	14	40	26

### Hook and line

Women go hook and line fishing with their children or other women on foot or by bamboo raft. During low tides women fish in **lemau**, blue deep pools within the inner reef flats and in the **lkes** or **chis**, shallow pools within the exposed area nearshore. Rafts are used at any time of the tide to reach more fishing areas within the inner reef. Women wade through the water collecting the sea cucumber **ngimes**, using the intestines for bait as they go along fishing with lines and hooks. Fish caught with this method and bait are mostly small snappers and wrasses (**chudech**, **itotech**, **mechur**, **chibars**, **budech**) (Table 17). This hook, line and bait method is a daytime activity. The catch is usually kept for subsistence.

Table 17. Fish catch (in pounds) by women using the hook and line method.

State	No. of Women	No. Selling	Average Catch	% Sold
Aimeliik	3	1	63	22
Airai	7	2	26	17
Koror	8	3	33	30
Ngaraard	8	5	30	45
Ngardmau	6	5	59	78
Total	32	16	42	38

Women accompanied by their husbands or in groups fish by boat to reach farther fishing grounds for more and bigger fish. For bait, most women prefer skipjack tuna, which are bought in the markets, and sardines, squid and octopus that they have caught. They catch more varieties of fish during nighttime line fishing than during the day. Species often caught are **chudech**, **keremlal**, **tiau**, **temekai**, **melangmud**, **kedesau**, **mechur** and **metengui**. Bad weather and busy schedules are the main deterrents for those who have access to boats to fish. Fifty-nine percent of the women surveyed use this method of fishing. Of the 32 interviewed, twenty women using this method go by motorized boats. Nineteen sell some of their catch, either fresh, smoked or fried, to the markets in Koror.

### Meluich

At night women use flashlights or lanterns and long-handled spears to catch fish. Traditionally, torches of dried coconut leaves were used. Women walk inside the reef within the nearshore areas during low tides at night, mostly on the new moon during the summer, looking for fish to catch. This fishing method is called **meluich**. One woman interviewed said that the best time to fish with this method is in November and December, during the low tides at night, when there are many fish. When fishing, women usually go on foot or use bamboo rafts. Some women interviewed said that when they go with their husbands they

occasionally catch more fish than their husbands. The women said that they they pull the string attached to the collection basin, carry a spear and flashlight, and catch fish, while their husbands spend much of the time searching for the biggest fish. Women seldom sell their catch, but instead, keep it for their family or relatives. Thirty-five percent of women surveyed are engaged in this fishing method.

TABLE 18. Fish caught (in pounds) by women who use the meluich method.

State	# of Women	# Selling	Average Catch	% Sold
Aimeliik	3	0	15	0
Airai	4	1	35	20
Koror	5	0	18	0
Ngaraard	5	2	25	32
Ngeremlengui	2	1	28	45
Total	19	4	24	19

### Kesokes

A seine net is used with the **kesokes** method. Seines are set covering a length of 500 to 1000 feet of the nearshore areas trapping the fish that feed inshore and in the mangroves. **Kesokes** are usually set from boats or rafts, when the tide is half way down. The nets block the entire area that the fish use to travel out to deeper water when the tide falls. Fish are trapped in the net when they try to return to deeper water areas. Women involved in this fishing method accompany their husbands or other fishermen who own the seine nets. This fishing is done all year long but mostly during the summer low tides and the spawning seasons of the rabbitfish which are February to May and July. Sometimes when a fisherman sets the seine nearshore, women, usually young women and children, who are gleaning nearby go and spear fish or collect trapped fish. This is called **mengesiau**. They help the fisherman to spear all the fish and bring some home for their family. At least one woman interviewed said she goes to the **kesokes** when she sees one. Four women, or seven percent of the total interviewed, catch fish with their husbands using **kesokes**. Most of the catch is sold to the markets and a small percentage is kept for subsistence.

TABLE 19. Fish catch (in pounds) by women who participate in the kesokes method.

State	# of Women	# Selling	Average Catch	% Sold
Koror	1	1	75	75
Ngaraard	2	1	85	42
Ngeremlengui	1	1	100	98
Total	4	3	86	71

### Surround net

Surround nets are used to cover areas where schools of fish are usually seen. They are set in front of rocks where the school of fish exit. The bag is set from the exit area or deeper part. From each end of the net the fish are chased into the bag and trapped there. Only one woman interviewed uses this method. This woman has her own boat and nets. If not accompanied by men, she goes fishing with two or three women. The catch is distributed among them for subsistence.

### Spearfishing

In the survey only one woman we encountered uses a speargun, mask, snorkel and fins to catch fish. A flashlight is used with night spearfishing. We learned through inquiries that very few women use this method to fish. Those who do usually have their own boats. Most women who spearfish, do so alongside their husband or other men as a recreational activity.

### Cast net

Only one woman interviewed uses a cast net. This woman catches small fish such as sardines and silverfishes for subsistence and for bait. She walks or wades alone along the nearshore areas looking for schools of small fish. When she finds a school she moves slowly toward them and throws the net over the fish. She gets an average catch of ten pounds of sardines per fishing trip. Very few women, usually older, are said to fish with this method using their husbands' cast nets for subsistence fishing.

## CRAB COLLECTION

### Land crabs

The land crabs, *Cardisoma hirtipes* and *C. carnifex*, are generally called **rekung** in Palau. However, other names such as **rekung el daob** (land crab of the sea), **rekung el beab** and **kakum** are also used. These land crabs make burrows in the forest floor one to six feet in length with a depth that depends on the water table depth. The crabs are forced out of their burrows during long, heavy rains -- when they are collected. Since their eggs are a popular food, they are also caught when they migrate to the sea (often a journey of several kilometers) to reproduce, several days before the full moon during the summer.. Women

from Airai and Koror collect the crabs from the Rock Islands during the full moon. Women from Ngaraard can collect them year round from the local forests. Ngaraard is the primary source of land crabs caught for commercial purposes according to the interviews. Some women in Ngaraard and Koror collect crabs and keep them in a pen or a large container (one woman uses the drum from an old washing machine) for one to two weeks until they want to eat them. One woman sweetens a pen full of crabs on coconuts and another woman fattens them with rice. They grow fat and the family eats them as they desire. Fifteen percent of the women interviewed collect these crabs; 38 percent of those for subsistence.

TABLE 20. Amount of the land crab, *Cardisoma hirtipes* and *C. carnifex* (rekung) collected by women. Numbers represent state averages.

	Airai	Koror	Ngaraard	Average
Average catch (in pieces)	35	50	58	48
Time spent (hr)	2	4	2	3
#times/month	2	N/A	2	2
%sold	10	0	64	25
Catch/unit effort (hr)	18	13	32	21

#### Coconut crab

When bait is used to catch coconut crabs, the method is called **omekang**. Women go with their husbands or in groups to collect the coconut crab, *Birgus latro*, **ketat**. Two women interviewed said that most of the time they go out to trap by themselves. Coconuts are most often used for bait. A coconut is cut in half and hung where coconut crabs are likely to be, along the edge of the rocks toward the shore. The bait is set early at night and visited every two hours. The crabs are caught when they come out of hiding to eat the bait. Other collectors use ground coconut, saying that it will keep the crabs outside of their hole for a long time trying to eat the small crumbs. Coconut crabs are also caught when the fruit of the seeded breadfruit tree, *Artocarpus marianensis* (**ebiei**), and the football fruit tree, *Bangius edule* (**riamel**), are ripe. Coconut crabs are attracted to the ripe, fallen fruits of these trees.

#### Mangrove crab trapping

Besides an occasional find by other women collectors, only one of the interviewed women regularly collects mangrove crabs, *Scylla serrata* (**chemang**), by trapping. Traps are made of chicken wire or plastic mesh with a height and diameter of 2.5 feet and a length of 3 feet. They are set along the mangrove channels and at the outside edge of the mangroves and visited during high tide in the morning when these areas are accessible by bamboo raft. The woman traps during the new moon when the wind direction is from the west. She visits the traps every morning with fresh bait of either fish, skipjack tuna, shark meat or canned mackerel with holes punched to emit the smell. She gets an average of eight crabs per trip.



Sometimes, she gets fifteen crabs out of the twelve traps she and her husband own. Since her husband is not a full-time fisherman, she visits and collects the crabs herself and sells them in the markets and one hotel in Koror, or to meet special requests and customs.

### Commercial Activities

Practically all women interviewed keep some of their catch for family use. About 24 percent collect or fish for subsistence purposes alone. The remaining 76 percent (41 women) sell at least some of the species they collect. The seafood collected by women may be an important part of the diets of some families. Four percent of the women interviewed said their families eat what they collect every day during those times of the year when they are collecting (usually summer); 11 percent said four to five times a week; 24 percent said two to three times a week; 17 percent said once a week. However, only 65 percent of the women interviewed were asked this question so these results may not be representative.

Much of the seafood collected by women is marketed in the main population center around Koror. The places women interviewed sell seafood and fish are listed by state in Table 21. Of the states interviewed, women in Koror and Airai use the largest number of marketing outlets, ten and nine, respectively. Women in Ngaraard and Ngardmau tend to sell to Yano and Sons. Women in Airai and Ngeremlengui sell most often to Oh's Fish and Produce. Only three of the women interviewed sell regularly to restaurants. However, 41 percent sell to individuals, often as a special request. Forty-eight percent of the women who market seafood sell to Oh's Fish and Produce, 46 percent sell to Yano and Sons and 15 percent sell to PMCI. Several women sell to more than one market, especially those women who live in Koror and Airai. The prices women receive for their market sales are summarized in Table 22. Many of the market prices vary from place to place. In addition, markets often buy seafood from various women at various prices. From these interviews, it did not seem that there were set prices for individual items. Unfortunately, the survey team did not have sufficient time for a full market survey to determine the market prices of each species sold.

TABLE 21. Markets and restaurants where interviewed women sell seafood and fish. Numbers indicate frequency of response.

	Aimeliik	Airai	Koror	Ngaraard	Ngardmau	Ngatpang	Ngerem- lengui	Total
<b>MARKETS</b>								
Oh's Fish & Produce	3	7	2	1	0	2	5	20
Yano & Sons	0	2	2	9	6	0	0	19
PMCI	3	0	1	0	0	1	1	6
PFFA	0	0	0	2	2	0	0	4
T&O	0	0	2	0	0	0	0	2
Blue House	0	0	1	0	0	0	0	1
Carmella's	0	0	1	0	0	0	0	1
Ngerebeched Women	0	0	1	0	0	0	0	1
Oh's store (Airai)	0	1	0	0	0	0	0	1
Ocean Development Corp.	0	0	1	0	0	0	0	1
Palau Fresh Produce	0	1	0	0	0	0	0	1
unspecified market (Koror)	0	1	0	0	0	0	0	1
unspecified market (Airai)	0	1	0	0	0	0	0	1
<b>RESTAURANTS</b>								
Pirate's Cove	0	0	0	0	0	1	2	3
Palau Pacific Resort	0	2	0	1	0	0	0	3
Furasato	0	0	0	0	0	0	1	1
Community Club	0	0	1	0	0	0	0	1
Nikko Hotel	0	1	0	0	0	0	0	1
<b>INDIVIDUALS</b>	<b>1</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>17</b>
<b># used by state</b>	<b>3</b>	<b>9</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>20</b>

TABLE 22. Market prices of species sold by women.

Species	Price/unit	Average amount sold	Income per sale
Giant clam (kim)	\$1.00-1.50/3 pieces	20 pieces	\$7.00-11.00 <sup>a</sup>
Sea cucumber (cheremrum)	1.00-1.25/10 pieces	80 "	8.00-10.00
Giant clam (oruer)	1.00-1.50/9 pieces	72 "	8.00-12.00 <sup>b</sup>
Sea cucumber (molech)	1.00/10 pieces	100 "	10.00
Sea cucumber (ngimes)	1.00-1.50/20 pieces	200 "	10.00-15.00
Sea cucumber (irimd)	1.00-1.50/10 pieces	100 "	10.00-15.00
Land crab (rekung)	0.35-0.50/pound	50 pounds	17.50-25.00
Sea cucumber (sekesakel) <sup>c</sup>	0.25 each	75 pieces	18.75
Mangrove clam (ngduul)	0.10-0.25 each	200 "	20.00-50.00
Coconut crab (ketat)	2.75 each	8 "	22.00
Mangrove crab (chemang)	5.00/pound	8 pounds	40.00
Fish	0.85-1.10/pound	50 "	42.50-55.00
Ark shell (kikoi) <sup>c</sup>	1.25/10 pieces	500 pieces	62.50
Fish, smoked or fried	2.25-2.50/pound	40 pounds	90.00-100.00
Urchin (choalech) <sup>c</sup>	2.50/15 pieces	750 pieces	125.00

a One woman regularly sells \$60 worth of this species.

b One woman regularly sells \$108 worth of this species.

c The figures for these species are based on the catch of three separate women. All other women interviewed who collect these species collect for subsistence purposes alone.

### Processing and Other Marketing Activities

Women are involved in other aspects of fisheries as well. They occasionally process or market the fish catch of a male relative. However, since we relied on interviewing those women who do fish and glean, it was difficult to find women who do not fish and/or glean but who are involved in marketing and processing someone else's catch. The numbers of interviewed women who market or process fish for a male relative are given in Table 23.

TABLE 23. Number of women who process and/or market fish for a male family member.

	Market	Process	Both	Total
Aimeliik	0	0	2	2
Airai	0	0	5	5
Koror	2	1	0	3
Ngaraard	0	0	4	4
Ngardmau	1	0	0	1
Ngeremlengui	1	2	1	4
TOTAL	4	3	12	19
Percent (of 54 interviews)	8%	6%	23%	36%

More than half of those women who market or process their husband's catch also fish with them. We did not ask the married women whether or not their husbands fish. It would be interesting to know the percentage of women who fish with husbands who fish regularly.

#### Problems and Changes Affecting Women's Fishing Activities

##### MARKETING PROBLEMS

Women identified several problems regarding the marketing of their catch. Data on these are given in Table 24. Transportation to markets and to gleaning areas was the most widespread concern: 85 percent of the women interviewed said some sort of transportation problems were important. Storage of the catch is a problem for six percent of the women. Problems with the processing of their catch were mentioned by six percent. Difficulty selling or low market prices were mentioned as problems by six percent of the women interviewed. Only one woman said she had no problems with either the collection or marketing of her catch.

The most common problem was access to the markets in Koror for those women living in states on Babeldaob. Thirty-five percent of the women interviewed said they have problems with transportation to the markets. Travel by automobile is possible only between Koror and Airai, Aimeliik, Ngatpang, Ngchesar and Melekeok. However, the roads are dirt and often

TABLE 24. Marketing problems encountered by women collectors. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraard (n=12)	Ngardmau (n=7)	Ngatpang (n=3)	Ngerem- lengui (n=5)	Total (n=54)
Transportation to markets	43	25	0	50	57	67	40	35
Transportation to lagoon areas	0	25	33	33	43	67	40	31
General transportation problems	14	13	25	17	0	0	40	17
Ice/storage	0	13	17	0	0	0	0	6
High transportation costs	14	0	0	0	14	0	20	6
Processing problems	43	0	0	0	0	0	0	6
Low market prices	0	0	0	8	0	0	20	4
Sales problems	0	13	0	0	0	0	0	2

full of potholes, which makes the ten-mile journey slow. Travel by boat is faster and more comfortable. In addition, it is the only way to travel to Koror from Ngaraard, Ngardmau and Ngeremlengui and other states on Babeldaob and those states that are isolated since they are islands (i.e., Peleliu and Kayangel).

One third of the women interviewed said they had problems reaching fishing and gleaning areas. Six percent mentioned lack of ice and other storage problems. Six percent said the cost of transporting goods to market was too high. Four percent said the market prices of their products was too low. Only one woman had problems selling her catch.

#### ENVIRONMENTAL PROBLEMS

Women who regularly collect from the waters around Palau have noticed many changes in their environment. At least one woman from each of the states surveyed had noticed some environmental changes in the local waters. However, women from Koror and Airai mentioned seven of the 11 problems mentioned by all the other women during these interviews. The most frequent responses to questions about changes they have noticed are listed in Table 25. Ninety-three percent of the women interviewed made some kind of response about environmental changes they had observed. Only seven percent noticed no changes at all. Some of the problems appear to be widespread, for example, dead corals and pollution. Others, such as the effects of gravel dredging and algal fouling, are more localized.

TABLE 25. Environmental and other changes observed by women gleaners/fisherwomen. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraard (n=12)	Ngardmau (n=7)	Ngatpang (n=3)	Ngerem. (n=5)	Total (n=54)
Dead corals/rocks	57	38	33	17	29	33	60	35
Pollution/trash	14	25	50	33	14	67	40	33
Fewer species	0	13	8	17	29	0	80	19
Effects of gravel or coral dredging	0	0	0	50	0	33	20	15
Too many people collecting	14	25	17	0	0	0	20	11
Algal fouling	29	0	17	0	0	0	0	7
Siltation	29	13	0	0	0	33	0	7
Cut/dead mangroves	0	0	8	0	0	0	0	2
Outsiders using area	0	0	8	0	0	0	0	2
Oil from boats	0	13	0	0	0	0	0	2
Lower water level	0	13	0	0	0	0	0	2

#### Dead corals and rocks

Thirty-five percent of the women interviewed noted that they had seen a lot of dead corals and rocks in the areas where they collect. This is particularly true for those women in Aimeliik, Koror and Airai. Their descriptions of the state of the reef flat ranged from bleached corals to those that have lost their color (especially around Airai). Dead rocks refer to rocks that have been broken or are covered with silt. In these conditions, the rocks no longer provide adequate shelter for marine organisms, such as giant clams, that previously lived within the rocks' crevices.

#### Pollution and trash

Thirty-three percent of the women mentioned pollution, in general, or trash, specifically, as a problem. Women from all states noticed this as a problem; however, the majority of positive responses came from Koror, Ngaraard and Ngatpang.

#### Fewer species

Nineteen percent of the women noted that they could find fewer species while they were out collecting. When asked directly if any species are harder to find now than they were before, most women could name at least one. The responses to this specific question are covered in more detail on page 33.

### Reef dredging

Women from Ngaraard, Ngatpang and Ngeremlengui are concerned about the effects of coral dredging. Half of the women interviewed in Ngaraard mentioned the Urung dredging site as a cause of concern. The women in the other states were not specific about the areas of concern.

### SPECIES THAT ARE HARDER TO FIND

When asked if certain species are harder to find now than they once were, 93 percent were able to name at least one. Twenty-one percent of the women said that all species are harder to find. Those species that women said are harder to find than they were in the past are listed in Table 26. Some women noticed changes in the conditions in the lagoon over the past 20 years, while others said things have changed in the past five years.

Fifty-seven percent of the women interviewed said that the rock crab, **kmai**, is harder to find now. Women in all states except Ngeremlengui mentioned this crab. Forty-three percent of the women said that the short-spined urchin, **ibuchel**, is harder to find now. Most of the women who mentioned that urchins are harder to find are from Ngaraard, Koror and Ngardmau. Twenty-four percent of the women interviewed said both kinds of giant clam, **kim** and **oruer**, are harder to find. **Kim** is harder for women to find in all states except Ngeremlengui. **Oruer** is harder to find in all states but Ngaraard and Ngatpang. Nineteen percent of the women said the mangrove clam, **ngduul**, is harder to find, especially in Ngeremlengui. Thirteen percent of the women said the sea cucumbers **ngimes** and **cheremrum** are harder to find, especially around Koror.

### Note on Questionnaire Design

The questionnaire developed for this study (Appendix 2) was designed to discover the role of women in fisheries, an aspect of the fisheries that had not yet been studied in Palau. The questionnaire was designed as carefully as possible at the beginning of the study to elicit the most succinct and dependable information. However, as the study progressed the survey team learned more about the roles and activities of the Palauan women. As a result, the team learned how to ask questions that would elicit the most informative answers. Future studies of the roles of women in fisheries can use the questionnaire in Appendix 2 with the following suggestions in mind.

Three of the questions in the questionnaire did not work as well as we had hoped. Those questions were: (1) Are your daughters/sons collecting/fishing for the same things that you did when you were their age; (2) If foreigners came in to collect a lot of a certain species what would you do; and (3) How would you feel if you or a woman's group could decide who came here to collect or if the group could collect permit fees from these outsiders. The first question was designed to determine which fishing and collecting methods are no longer in use. However, most women answered this question in terms of species abundance and collection areas that had changed. The second two questions were designed to determine

TABLE 26. Species women notice are harder to find. Numbers represent percent of responses.

	Aimeliik (n=7)	Airai (n=8)	Koror (n=12)	Ngaraar (n=12)	Ngardm. (n=7)	Ngatp. (n=3)	Ngerem. (n=5)	Total (n=54)
<b>MOLLUSCS</b>								
<i>Tridacna</i> spp. (kim)	14	13	33	25	29	67	0	24
<i>Tridacna crocea</i> (oruor)	14	13	33	0	14	0	20	24
<i>Anodonita edulenta</i> (ngduul)	0	25	17	0	29	33	60	19
<i>Conus</i> spp. (ototl)	0	0	0	8	0	0	0	2
<b>CRUSTACEANS</b>								
<i>Portunus pelagicus</i> (kmai)	100	75	50	50	43	100	0	57
<i>Scylla serrata</i> (chemang)	0	25	0	8	0	0	0	6
<i>Cardisoma hirtipes</i> (rekung)	0	13	0	8	0	0	0	4
<i>Birgus latro</i> (ketat)	0	13	0	0	0	0	0	2
<i>Panulirus</i> spp. (erabrukl)	0	13	0	0	0	0	0	2
<b>ECHINODERMS</b>								
Short-spined urchins (ibuchel)	14	13	42	67	57	67	40	43
<i>Toxopneustes pileolus</i> (duduomel)	0	0	8	0	0	0	0	2
Sea cucumbers								
<i>Stichopus variegatus</i> (ngimes)	0	25	33	0	0	33	0	13
<i>Actinopyga miliaris</i> and <i>A. echinites</i> (cheremrum)	0	13	42	8	0	0	0	13
<i>Holothuria</i> sp. (irimd)	0	0	0	33	0	0	0	7
<i>Holothuria verrucosa</i> (sekesakel)	0	0	0	25	0	0	20	7
<i>Holothuria scabra</i> (molech)	14	0	8	0	0	0	0	4



where women would turn for assistance if their collection areas were being harvested commercially. Although the last two questions revealed that women generally feel powerless in the face of outsiders who collect or fish around their states, we had hoped we would be able to determine organizations or groups that are important as support systems for the women. A more specific question which asks directly about the organizations that women belong to would have elicited answers more effectively.

In addition, it was necessary to add four questions to clarify certain points: (1) how often does your family eat what you collect; (2) how much money do you make per month by selling seafood; (3) how do you transport your catch to market; and (4) how often do you market what you collect. These questions were added after several states had been surveyed. Unfortunately, these questions were not asked in those states where transportation to the markets was found to be a problem (i.e., those states on Babeldaob not accessible by road to the markets in Koror and Airai) or in states, especially on Babeldaob, where women depend on seafood collection for a main source of income.

Finally, there were two questions that we did not ask, but wished we had when it came time to analyze the data. The women were not asked if they have full or part-time jobs outside of their homes. This question is important to determine how many of the women interviewed are solely dependent on seafood collection for income if they sell to markets or for food if they collect for subsistence purposes. They were also not asked if their husbands fish regularly. This question would have helped to more fully determine the significance of family fishing activities and to determine the percentage of married women who regularly fish with their husbands. Without this question, we could establish only the number of women who fish with their husbands; we could not determine how significant that number is in relation to married women who do not fish with their husbands.

Despite these problems, the questionnaire was well-suited to gaining an understanding of women's contributions to the Palauan fisheries. The women responded to the questions enthusiastically and answered all of them as best as they could. Similar studies elsewhere in the Pacific should be encouraged to more fully recognize the significance of women in the world's fisheries.

## DISCUSSION

Some authors have called the coastal waters around Palau a men's domain in which women and children are only brief visitors (Smith, 1977; Klee, 1980). However, this study has shown that women are more than just visitors; they spend many enjoyable hours fishing and gleaning within the barrier reef surrounding Palau. They collect fish and other marine species from areas that are accessible by foot or bamboo raft, especially when the tide is low and the fringing reef is exposed. This area is extensive, covering more than 1300 km<sup>2</sup> and women collect from several areas within this zone. Mangrove forests surround most of Babeldaob. The mud flats in and around the mangroves support mangrove clams, crabs, snails and a wide variety of other invertebrates. Outside the mangroves, where the bottom of the lagoon becomes sandy, seagrass beds are inhabited by sea cucumbers, clams, crabs and molluscs. A few coastal areas, especially on the east coast of Babeldaob and in the Rock Islands, have sandy beaches rather than mangrove forests. Women collect many species of molluscs from these sandy beaches. Further away from the beach or mangroves, rocks and corals scattered along the seafloor provide a habitat for urchins, molluscs and crabs. The fringing reef, accessible at the lowest tides of the new and full moon, contains giant clams, shells, urchins and other invertebrates as well as fish that get trapped in deep vertical holes within the reef. Women who own boats, or who fish with their husbands, can venture further out towards the barrier reef where fish and trochus snails are abundant.

Both women's and men's fishing activities are concentrated inside the barrier reef that surrounds Palau. Women walk or travel by bamboo raft to areas where they can collect invertebrates and fish. Men venture further from shore since they have traditionally owned boats, hooks, nets and other gear used to catch quantities of fish. Although many women are catching fish with their male relatives, most women tend to collect invertebrates by reef gleaning while men dominate the fishing industry. Economically, the fish caught by people in boats is more significant than the invertebrates collected by women and children. Men who fish tend to make more money from their effort than women who collect invertebrates for market. The size of the catch is often very different. A boatload of fishermen can bring in hundreds of pounds at a time, whereas a woman gleaner usually sells no more than 50 pounds at a time. In addition, fish, lobster and crabs, especially large species, have a higher market value than most of the species collected by women. The value of women's fishing and collecting activities usually lies not in the amount of money that women can make as a result of their activities but in social and nutritional areas that have not been identified adequately.

The traditional structure of Palauan life is changing due to the pressure of modernization and foreign influence; however, much of this tradition remains intact (Force and Force, 1981). Although men appear to dominate much of the recent economic growth and political activities in Palau, the women have by no means lost their power (Margold and Bellorado, 1985). Organizations of women continue to meet, especially in Aimeliik, Airai and Koror. The family and clan are still extremely important for many Palauans. Some of the traditional customs are important and demand time, energy and quantities of food.

Women's role as taro cultivators is changing, leaving more free time to venture into the water and other areas. Several of the older women interviewed said that the younger women that they know are working less in the taro patches. A recent study reported that Palauan women only spend about four to eight hours a week in the taro patches, whereas they once spent more than 40 hours a week farming taro (Bammann and Wey, 1991). Many younger women hold full and part-time jobs away from home. They do not have the time or often the land to farm taro so they buy it in the markets. In addition, some of the wealthier women hire people to help them with their gardens. Although taro is still an important part of Palauan life and customs, other foods such as rice and tapioca are also available and popular so it is no longer the only staple food. As a result, the demand for taro has decreased. Since its cultivation is not as time-consuming as it once was, more women have time available for other activities. A popular activity appears to be seafood collection.

The range of women's fishing and collecting activities is large. Some women collect enough seafood to feed their families and to give to relatives; a few are full-time fisherwomen. Practically all women interviewed keep some of their catch for family use. About 24 percent collect or fish for subsistence purposes alone. The remaining 76 percent sell at least some of the species they collect. Some women collect certain species, such as mangrove clams or land crabs, especially for market while they collect other species, such as sea cucumbers, for family use alone. Several species of sea cucumbers, large clams and crabs collected by women are sold in markets in Koror. Other species, most notably snails and other gastropods, small clams, urchins and small crabs, are collected in small amounts for subsistence use only. Often they are collected when the family is out on a picnic at the beach or in the Rock Islands or when other foods are not available because of bad weather. In general, when women collect for subsistence purposes only, they collect significantly less than those women who market their catches. Often the women who usually collect only for subsistence said that if they find more of a species than they would normally bring home to their families, they would sell the excess. However, those women who sell tend to do so on a regular basis.

General gleaning is the method used by most of the women interviewed. Collecting mangrove clams is also a popular activity. Fishing with hook and line may also be significantly more important than the survey indicates. Most of the women interviewed were older than 50 years of age. They are the women who tend to collect the more traditional women's foods, i.e., invertebrates. It appears from the comments made by many of these older women that younger Palauan women fish more often today than they did when they were younger.

From the interviews conducted during this study, it became clear that women who live in Koror are more likely to collect for subsistence than commercial purposes. Women in the other surveyed states tend to collect for income. This may be due to two factors: (1) women have more employment options in Koror than in other states; and (2) markets prefer to buy seafood from states where pollution is not as widespread as it is in the more populated state of Koror. However, it should be noted that the women interviewed during this study were those who were found at home. Those women from Koror and Ngatpang who are known to

sell their catches were not at home when the survey team was in their neighborhood. They were out fishing.

Many women collect to market their catch, but social, cultural and nutritional factors appear to outweigh the economic value of the activities of women in Palauan fisheries. In addition, on an individual level, many women collect from the reef flat, not for the money, but because they enjoy it. Social values are difficult to quantify. We believe that the social value of women's involvement in the collection of marine resources is greater than the economic gain of these activities at the present time. Women seldom collect at low tide or fish alone. They are often accompanied by their friends, relatives and children. It is a way family and friends can enjoy a communal activity. It is a way to unify families that are under increasing fragmentation as some members leave rural villages in search of jobs or an education. Husband, wife and family fishing activities are also important in strengthening close family ties.

Most of the invertebrate species collected by women and children were not rated as highly in traditional Palauan society as fish and taro. Women were responsible for bringing starchy foods such as taro (*ongraol*) to the family table and as part of the customary exchange network. Men were responsible for bringing animal protein (*odoim*) especially fish, to the family. The women's seafood contribution was more a part of everyday family life and not valued as ritual food. This is beginning to change slightly. Several of the women interviewed mentioned that they have collected giant clams, mangrove clams, long-spined urchins, sea cucumbers and crabs for traditional customs and parties.

The major exchanges of food and Palauan valuables at births, marriages, divorces and deaths are generally called "customs" in Palau. Gatherings of family members to raise money and contributions of labor for house building or boat acquisition may also be referred to as customs. A newer variation, called a "house party", is an event where family and friends are invited to a gathering where the hosts receive cash contributions for the construction of their house. This is not technically considered a custom since no exchange of Palauan valuables (ceramic beads or turtle-shell carvings) takes place.

At a custom, the wife's side of the family provides food and labor in exchange for a valuable or money. The complex exchange patterns are described more fully by Smith (1983). Traditionally, the prepared food trays that were exchanged during a custom consisted of fish (especially large fish such as the humphead wrasse, *Cheilinus undulatus*) and taro. Men caught the fish, and occasionally mangrove crabs, and the women provided the taro. Some of the women interviewed in this study, however, are collecting giant clams and mangrove clams for customs -- especially as gifts for the women who are involved in the intensive food preparations. Some women also said during these interviews that they receive special requests for urchins and other seafood for house parties that are held at such places as the Community Club in Koror. More thorough documentation of the processes by which seafood is brought to customary exchanges in contemporary Palauan society is needed in order to more fully understand if the food collection patterns are changing and if the women are

becoming more significant contributors of **odoim**.

Women's seafood collection activities are important from a nutritional standpoint as well. Several women (22 percent) said their catch is their family's main source of protein. Some women also said that seafood is good when people are sick or to help ward off illness. For instance, the sea cucumber called **irimd** is said to help arthritis sufferers. As such, seafood collection is very important to support family members who cannot work.

There is a drive in many Pacific islands to promote natural foods in favor of those that are highly processed. A Headstart program in the Palau Community Action Agency aims to increase the amount of natural foods in the diets of families throughout Palau. Preliminary information obtained from this study indicates that the seafood women collect is already an important part of family meals. Many families eat seafood collected by women several days a week in the summer when the catch is good and the tides are low. Traditionally, non-fish types of seafood in Palau was considered women's food and fish was men's food. Small amounts of fish would be put aside for men's meals, while women, their children and older people ate sea cucumbers, clams and other invertebrates. According to some of the women interviewed, men today are eating seafood collected by women more often than they did in the past. Seafood collected by women is sold in many markets and restaurants. A year-long food production and consumption study is planned for Palau in the year ahead and the results will help clarify the significance of women's seafood collecting activities.

The economic significance of the women's fishing activities in the cash economy is generally smaller than that of men. According to market data collected at the Division of Marine Resources, fishermen earn about \$500 per month while the most any of the women interviewed said they earned was \$350 in a good month. The results of the surveys were not sufficient to calculate accurately either total yearly sales or catches of the species women collect. However, most of the products the women market have a lower retail value than the products marketed by men. Sea cucumbers, in particular, have low market value. More importantly, these species are sold in such small quantities that their economic significance is slight. Some species collected solely by women have significant market value, especially mangrove clams and urchins. However, mangrove clam collection is quite time-consuming and ripe urchins are usually abundant for only one month in the summer. Some of the women are collecting seafood with higher market value such as mangrove crabs and coconut crabs. They are beginning to earn more money by going after the more valued catches that have generally been collected by men. Five of the women interviewed are full-time fisherwomen. They glean, fish and collect clams practically everyday for sale to markets and restaurants. They are known as reliable collectors and often receive requests from individuals or restaurants to catch some particular species for customs or parties. These women catch much more than the other women interviewed, whether for subsistence or market.

There were hints during this study that some women would sell more often than they do if they could. However, low market prices for most species, high transportation costs and busy schedules often prevent them from collecting and marketing more. Other women are

interested in smoking fish but they do not have the smokehouses necessary to do so. Smoked fish fetches a much higher price (\$2.25-2.50 per pound) in the markets than fresh fish (usually \$1.00 per pound). In addition, some other species that are collected in Palau by both men and women, such as trochus, clams and oysters, could also be smoked and sold if women had access to smoking facilities. Repackaging some of the species sold could help standardize the prices paid by the markets as well attract other buyers. For instance, the sea cucumber *ngimes* is usually sold in used beer or soy sauce bottles of various sizes. There is no label indicating what is inside the bottle or where it came from. A trial project to promote and develop the women's processing and marketing skills through a women's fishing cooperative could help to organize trips to markets so they can sell a higher quality product in clearly labelled containers. Such a project can be initiated in states such as Aimeliik or Ngardmau, where women have expressed such interest.

As Palauans search for ways to develop their economy, the country grows and changes. Population is increasing: preliminary figures from the 1990 census indicate that the population has grown 25 percent since 1980. The population is also shifting as people move out of the more remote states to Koror and Airai in search of work. In addition, tourism and the resultant development are changing the coastal environment. Several large resorts are in the planning stages. Growth has its positive influence by stimulating market sales and increasing prices. However, growth also puts pressure on natural and economic resources. Most of the women interviewed for this study have noticed environmental changes in the areas they fish and glean. They have also identified several problems that inhibit their growth as nutritional and economic providers for their families. The environmental problems are the result of population growth, poor regulation and development. The problems associated with collecting, processing and marketing are generally the result of neglect. The fishing and gleaning activities of women have been overlooked as fisheries development projects have focussed on those resources that the men are more actively catching (nearshore and pelagic fish, for example). Environmental, economic and social pressures have made collecting nearshore invertebrates and fish more difficult for many women. Although none felt that circumstances were so bad that they were forced to stop collecting, a study of the available habitat and resources is necessary in order to determine the status of the stocks of nearshore invertebrate species. Such a study is vital to determine the pressure on the nearshore marine resources in order to properly manage this environment.

Since most women do not own their own boats, they generally rely on others for transportation to markets in Koror. Some states own and operate boats that have regular scheduled service to and from Koror. They operate once or twice a week in both directions. Other states have boats that can be chartered for the trip. There is a fee to travel on or to transport goods on these boats. Often the fee is prohibitively expensive. Several of the women in Ngardmau said the \$60 fee to charter the state boat is too expensive for them. If anything happens to the state boat, the women may be unable to reach the markets in Koror. A program to organize women so they can bring their catch to markets collectively using the boats that are available would help to alleviate this problem.

Once they have reached the dock in Koror, women need transportation to the markets. Some women take taxis or rely on friends or relatives for transport. Fortunately two of the markets, Oh's and PMCI, are directly across the street from the dock. Some markets that are further away from the dock, such as Yano and Sons, send a car to meet the women. Some of the smaller markets, the Blue House and T&O, buy seafood only from women who can reach the market. As a result, all women who sell seafood to these markets are from Koror. Groups of women can arrange to have one or two women bring the collective catch to market. A program to shuttle these women to local markets that are not as accessible as those markets mentioned above can help this side of the transportation problem. Alternatively, a women's fishing cooperative located north of Koror that buys the seafood from the women and sells it to markets in Koror would decrease the distances the women need to travel to sell their catch.

A similar problem is the increasing difficulty in reaching gleaning and fishing areas. Women from all states but Aimeliik commented on how far apart gleaning areas are. Many also mentioned that they need to travel much further from their villages than they used to in order to find the species they would like to collect. One woman collects extra sea cucumbers from areas further away from the shore and "plants" them near the shoreline. Sometimes, however, she finds that all the sea cucumbers she has moved closer to shore have been collected by someone else. Increased pressure on the resources due to a constant flow of collectors can be part of the reason for this problem, especially in the waters around the more populated states of Koror and Airai. In some areas the loss of marine habitat may be a more important factor. Existing state permitting laws need to be enforced in order to regulate the pressure on the resources from outside users. In addition, habitat and resource surveys would help to determine the extent of population and development pressure on the nearshore areas that women depend on for collecting seafood.

Women did not think storage or processing problems are as much of a concern as transportation problems. However, storage may actually be one of the reasons that transportation to markets is such a large concern. Without the proper storage facilities and techniques to preserve seafood women feel they need to get their catch to market more often than if they had the facilities to adequately store it. Thus, they say they need boats to reach the markets. Lack of adequate storage facilities limits the days that women can collect. Often women can get to the markets in Koror only once or twice a week. In order to have a fresh product to sell, many women collect a day or two before they travel to the market. In general, women are individually responsible for storing and processing their catch until they are able to bring it to markets. Large freezers and iceboxes are rare outside of populated areas around Koror. Therefore many women rely on other preservation methods to keep their goods fresh. Some species of sea cucumber are salted and can be kept unrefrigerated for two to three days. Giant clams are preserved with vinegar, salt or can be lightly cooked so they do not need to be sold the day they are collected. Mangrove clams, ark shells and other bivalves are kept fresh for a few days if they are stored in buckets of seawater. Crabs are often kept alive until they are ready to be sold or eaten. These techniques are used by women throughout Palau. A handbook describing the most effective and appropriate techniques should be developed for further outreach and education so women can learn the

best methods of collecting and processing seafood. In addition, the Palau Community Action Agency has programs that can be used to aid community and village-level development, such as financing village-owned smokehouses. These programs need to be more fully advertised so they can be utilized by the women who want to improve their storage and processing methods.

Finally, the prices of products that women sell are relatively low. It may not be worth the effort and cost of collecting and bringing some species to market because the prices are not high enough to pay for the transportation costs. Although mangrove clams are one of the more profitable species women collect, the following scenario illustrates how little women may actually earn in the end. A woman from Ngardmau will spend most of the day, about seven hours, collecting about 200 mangrove clams. Several more hours are necessary to clean, sort and bag the best clams for market. She may sell them for ten cents apiece and make \$20.00. However, if she does not have a boat she may need to take the state boat that can be chartered by a group for about \$60 for the hour long trip to Koror. If a group of seven women travel to market together, the transportation cost will be \$8.50 each. However, if less women travel together, the cost is proportionately higher: \$10 each for six women, \$12 each for five women and so on. The women from Ngardmau sell to Yano and Sons Market which provides transportation from the dock to the market. If one of the women wanted to sell somewhere else, she would have to find transportation. A taxi would cost her a few more dollars. Ideally, this process will net one of the seven women about \$11.50 for about ten hours worth of work and travel. However, if only five women made the trip to the Koror market, they would each have to pay \$12 for the boat trip, and only net \$8 from their sale of mangrove clams. Increased market prices, as well as more access to affordable transportation, would help these women make ends meet.

Women who regularly collect from the waters around Palau have noticed many changes in their environment. At least one woman from each of the states surveyed had noticed some environmental changes in the local waters. Only seven percent of the women said they had not seen any changes in their collection areas. Those women who had not observed any changes often had only lived in the area for a short while so had no basis for comparison. Women from Koror and Airai mentioned seven of the 11 most common problems. Some of the problems appear to be widespread throughout the survey area, dead corals and pollution, for example. Others, such as the effects of coral dredging and algal fouling, are more localized. Half of the women in Ngaraard mentioned the reef dredging site at Urung as a concern. Dredging corals for road building and other development activities can significantly impact the species and nearshore habitats the women collectors depend on. Some states, in particular Ngatpang, have fewer productive mangrove areas left due to unpermitted building activities and sedimentation from runoff. Many development activities are planned that could have an adverse impact on these areas. For instance, a large resort complex that would be built partially on land-filled nearshore areas is in the planning stages for an area in Koror called Ngesaol (Birkeland *et al.*, 1990; Western Pacific Women's Research Network, no date). Ngesaol is the only area where the women from Koror interviewed in this study can collect mangrove clams. A large-scale development of this sort would surely have an impact on



these women. Care should be taken to critically assess the impacts of such development schemes on the nearshore environment and on the people that utilize the resources of those areas.

The women interviewed for this study identified 16 species that are harder for them to find now than they were before. The number of people collecting may be increasing in certain areas. As a result, some areas may be subject to more overuse than others. Any fisheries development plan should take care not to promote the collection of greatly increased numbers of some of the already scarce resources. A survey of other species that are not currently collected, but for which there may be a market, would help to protect the lagoon from overharvesting. People are moving from other states to Koror and Airai. They still collect the species they prefer to eat. This is added pressure on the resources. Species may be harder to find for several reasons. It does not necessarily mean those species are being overharvested. Natural fluctuations, that have nothing to do with overharvest, may occur in a population. In addition, in order for a woman to identify a species as being harder to find (1) a species has to occur in a certain area; (2) a woman has to be searching for a particular species and not be able to find it; (3) a woman has to be familiar with a species; and (4) she has to have some idea of what species used to be found in the area. Some species that used to be sought may no longer be collected. Older women mentioned several species of sea cucumbers, oysters and urchins that people used to collect (see Appendix 2). There are several possible explanations for this. Some species may not be as abundant as they once were. Some species are not easy to collect or require a lot of time to collect so few people feel it is worth the effort. Certain collection methods, such as stone weirs that used to be used to trap fish are no longer used. Other sources of protein (tinned meat and fish, for example) are available to many people, so utilization of those species that were collected formerly when food was in short supply is no longer necessary.

Little is known about the habitat areas and abundance of species around Palau. The nearshore areas around Koror and Airai are large and should be able to sustain the increase in collectors. However, many of the women interviewed have been collecting from the same areas for more than 40 years. They are very familiar with the species that can be found in that area. Thus, their observations of changes on the reefs should be considered when a more complete habitat and species abundance survey is undertaken.

Small-scale aquaculture projects are another possibility to increase women's fisheries activities. Giant clam, prawn, black-lip pearl and milkfish aquaculture projects have been attempted in Palau throughout the years with varying amounts of success. A study to determine the options to develop appropriately scaled aquaculture projects and small-scale pilot projects should be considered and encouraged.

Several large-scale operations may affect some of the species women collect. In addition to women gleaners, a few men collect sea cucumbers for export in a small, but significant, *beche de mer* fishery (Ilek, 1991). *Beche de mer*, boiled and dried sea cucumber skins, is a delicacy in China and Hong Kong. Several species of sea cucumbers have been processed

and sold as *beche de mer* from throughout the world for almost two centuries. *Beche de mer* makes up only about one percent of Palau's fishery (Division of Marine Resources, 1991; Ilek, 1991). The sea cucumbers are collected in large numbers nonetheless: one operation collected approximately 10,000 sea cucumbers from several areas around Palau in a 25-day period. Since the boiling and drying process reduces the size of the animals by about one-third, only a few of the larger species can be used. These large sea cucumbers are usually found in deep water. As a result of the necessity to use boats to reach the deeper-water collection areas, few women are involved in this fishery. One woman, however, works with her husband to smoke the sea cucumbers that have been collected. The sea cucumbers that are popular for *beche de mer* are not necessarily the same species that the women collect. However, little is known about the reproductive biology of the Palauan sea cucumbers and removal of great numbers of large individuals from deep water areas may actually have an effect on the recruitment of individuals to shallower areas. Care should be taken to observe the effects of this unregulated fishery.

The giant clams are another group of invertebrates that have been harvested in large amounts. Giant clams are a popular food. They are so popular that they are considered endangered and their export is banned by the Palau National Government without special permits. Foreign poachers and local fishermen have helped to decimate the stock of these clams. Only the powerful adductor muscle (used to keep the shell closed) is taken by the poachers, the rest of the meat is left to rot. Women in Koror said they can no longer collect the giant clam *kim* from the nearshore areas as they used to. Men with boats who can reach areas further away do most of the collecting as a result. Many areas around Koror and Airai that were once populated with giant clams now only contain dead, overturned shells. Clam farms, especially the Micronesian Mariculture Demonstration Center (MMDC) on Malakal Island in Koror state, are raising giant clams for sale to local restaurants. Clams from this center are sold for \$5.00 per pound whereas the women interviewed generally sell them for \$0.75 per pound. Women should be encouraged to sell their catch to restaurants that are willing to pay higher prices for high quality seafood. Packaging and marketing skills could be developed through a marketing cooperative so more women are competitive with such operations. In addition, the success of the MMDC also suggests that women can and should help in the development of more aquaculture projects.

More species are probably being collected than were accounted for by this study. People from other islands in the Pacific may also be out collecting the species that they prefer to eat. For instance in Ngaraard, women noticed that there are fewer of the sea cucumbers called *choas* (*Holothuria atra*) in the nearshore waters because girls from other islands attending the Bethania School like to eat them. The Palauans do not like this sea cucumber. In addition, people from the Philippines, Korea, China and other Asian countries who have moved to Palau to work occasionally collect seafood from the nearshore areas. Whether or not these people collect the same species as the Palauan women is not known. Brief surveys conducted on the reef would help to determine the significance of other collectors in Palau. In addition, the results of these surveys could help to uncover other marine species that could be collected and marketed by women.

## Programs Available to Aid Women in Fisheries

Several development programs can be used by both fisheries management personnel and the women themselves. They range from existing state legislation to international organizations. The following is an overview of the types of assistance available through local laws and local, government and regional organizations.

### LOCAL LAWS

Six of the seven surveyed states have some laws that protect the resources women and children collect. Many of these laws are not well enforced and the penalties for noncompliance are not steep enough to deter any unpermitted large-scale harvest, if it exists. The laws exist, however, and should be more strictly enforced. Airai is the only state without such regulations. Permits are required in Aimeliik and Ngardmau for commercial fishing within the waters around the state. This presumably extends beyond fish resources to include commercial harvest of sea cucumbers and giant clams. Women collectors are not required to have such permits since the state officials feel that their catch is relatively small compared to most commercial fishermen. Koror has several laws that may pertain to the species women collect: (1) only Koror residents are allowed to fish or collect in the Rock Islands and "are required to carefully observe Koror traditional and cultural methods and regulations"; (2) permits are required to collect shells except for scientific or subsistence purposes; and (3) export of giant clam meat is prohibited. In 1990, Ngaraard State declared all marine waters around the state a marine life conservation area. However, no regulations have been promulgated by the governor regarding this law. The harvest of land crabs during the full moon was banned by the traditional chiefs of Elab hamlet in Ngaraard in order to protect that resource. In Ngatpang there is a complete ban on the harvest of mangrove crabs during the months of their spawning season (March through August). Permits are required for their collection during the rest of the year. The Ngeremlengui Fishing Conservation Act of 1987 restricts certain areas from any form of fishing. These restrictions apply to fish species only and the Council of Chiefs can allow fishing in the restricted areas "if the need should arise or if they deem it necessary."

### LOCAL ORGANIZATIONS

The idea of a women's club has roots in Palauan tradition. Traditionally, groups of women met to prepare food for customary exchanges at funerals, births and marriages, to practice dances and to socialize. Most states have traditional women's groups that still meet for special occasions such as customs and community events. A few states have groups that meet on a regular basis. Other groups have formed more recently. Some groups in Koror, Airai and Aimeliik are beginning to show a strong interest in developing the fishing, collecting and marketing activities of their members. Esisebangiau, a women's group from Airai, recently received financial support from external sources to buy a boat and build a market for their catch. They could become a model for other women's groups because of their persistence, determination and success. The Ekei Club, a woman's group in Koror, has set up a market that sells produce and seafood twice a month. Women in Ngardmau are also beginning to solicit help from funding organizations to develop their fishing and gleaning activities.

Two other local organizations may be of assistance to women involved in fisheries. The Palau Community Action Agency (PCAA) is a community-based non-governmental organization that works on economic development projects throughout the country. They have community organizers in every state that act as liaisons between the villages and the PCAA office in Koror. PCAA has a few projects that could help village women develop their seafood processing abilities. One is a village improvement project whereby a village can apply for a smokehouse or other project that could be used by the entire community. PCAA also offers revolving funds to help finance some projects. For instance, a person can apply for a loan for a small project such as a smokehouse and pay it back when the project begins to make money.

The second organization is the Palau Resource Institute. This group conducts social science research and environmental and socio-cultural impact assessments of development projects. They are a research-oriented organization that works by contract on various projects. One of the three women who run this organization has expressed interest in working with a women in fisheries development project. They offer networking skills and help with community outreach and education.

#### GOVERNMENT ORGANIZATIONS

The Division of Marine Resources offers assistance with projects and proposals that help to develop the fisheries in Palau. In addition, the Division can demonstrate the use of portable smokehouses to individuals who are interested.

#### REGIONAL ORGANIZATIONS

Several regional organizations fund training programs, workshops and other projects to improve fisheries throughout the Pacific. The South Pacific Commission (SPC) in Noumea, New Caledonia; the Forum Fisheries Agency (FFA) in the Solomon Islands and the Food and Agriculture Organization's Pacific Regional Fishery Support Programme in Suva, Fiji are the three main regional organizations that help developing fisheries. The SPC's technical expertise and the new Women in Fisheries Programme can assist projects for women who wish to improve marketing and processing techniques. The Food and Agriculture Organization's Regional Fishery Support Programme and the FFA offer technical support to developing fisheries throughout the Pacific. In addition, the South Pacific Regional Environmental Programme (SPREP) in Noumea, New Caledonia offers support for conservation and other projects aimed at protecting the biological resources of the Pacific.

#### Recommendations for Development and Management of Women's Fisheries Activities

Women have many responsibilities that need to be taken into account for any development and management plan to succeed. In Palau, the work load of women is high. They care for children, both their own and those of relatives. Many still spend a significant amount of time farming taro. Many women are working full and part time jobs. Those women who collect

and process seafood already spend many hours doing so. Any development scheme should recognize that the woman's workload is already high. Many women may not have the time to stop their work in order to develop new skills (Steele, 1991). Development should aim to increase the profits and effectiveness of women's collecting, processing and marketing activities rather than developing new projects for them to work on. In addition, many of the resources that women collect may not be able to sustain a large increase in the amount collected. In fact, a few of these resources, most notably giant clams but also possibly urchins and some crabs, already seem to be feeling the strain of overharvesting and habitat loss. In light of this, the following recommendations are offered to help develop and manage the resources the Palauan women collect. Most of these recommendations rely on increased extension and education for the women collectors. Others require cooperation from regulatory agencies to enforce existing laws.

A year-long project to aid the women in Palau's fisheries would enable the Division of Marine Resources to continue and expand on the present three-month study. Much has been learned during this short study, but much more needs to be learned in order to properly develop and manage this aspect of Palau's nearshore fishery. A one-year women in fisheries project could encompass some or all of the following related projects:

1. Complete market and restaurant surveys to determine (1) actual amount of the women's catch that is sold in Koror's markets and restaurants; (2) seasonality of species collected, if any; (3) amount prices can be increased for repackaged and higher quality seafood; (4) the market demand for these species; and (5) other species that could be collected and sold, especially those that would be popular with the Japanese tourist market.
2. Choose one or two states where the women have expressed a desire to develop their fishing and gleaning activities. Establish a cooperative group to repackage some of the seafood products, coordinate and facilitate transportation to Koror markets through the use of existing boats, target markets and restaurants that are willing to pay a higher price for a higher quality product and encourage record keeping among the group for their own use and to aid monitoring of the resources.
3. Conduct workshops on storage, processing and marketing techniques. These workshops should be conducted in Palauan in villages throughout the country to enable women with busy schedules to attend.
4. Build smokehouses in villages where women are interested in using them, teach people the best smoking methods, if necessary and determine what species in addition to fish can be smoked and sold. The current moratorium on trochus harvesting will end in 1992. Perhaps a program can be developed in which women smoke and market the trochus meat.

5. Assist women's organizations who are interested in developing small-scale aquaculture projects.

An additional project is to compile a handbook of the invertebrate species women collect, including the best collection and processing techniques, to be used as an education tool for women who want to improve or change their methods. With additional funding this handbook could be expanded to include all nearshore species that can be found at low tides in the lagoon. Such a book would be a valuable educational tool for marine science and environmental education curricula. It would also be valuable to visiting scientists since no formal documentation has been made of the invertebrate species of Palau. In addition, it could be offered for sale to tourists as a guidebook of the nearshore, intertidal life of Palau.

#### MANAGEMENT PLANS

A nearshore fisheries management plan for Palau needs to include information that can be gathered through resource surveys and increased monitoring. Habitat and species abundance surveys should be done in order to determine what the current status of the nearshore invertebrate stocks is, especially in the heavily used areas around Koror and Airai. Such a study is necessary for future management plans. Commercial species, especially those that are harvested in large numbers (i.e., *beche de mer* and giant clam) should be more closely monitored to protect subsistence activities. In addition, regulations and permitting to protect states from outside users of the limited resources is critical if marine resources are to be effectively managed.

#### CONCLUSION

This three-month study has helped to document the role of women in the Palauan fisheries. As with any study, it opened up areas where future work is necessary. One of the main limitations of this study was time. It is necessary to travel to the remaining nine Palauan states for a series of short interviews in order to determine if other factors are affecting the women collectors in those states. The list of recommendations is another indication of the amount of work that should be done in order to more fully manage and develop the resources the Palauan women collect. This study provides the basis for future study and a framework from which to plan and assist women in the immediate future.

## A SURVEY ON THE ROLE OF WOMEN IN FISHERIES IN PALAU

## Consultant's Terms of Reference:

## A. General

To produce a report based on surveys conducted in coastal communities on the role of women and their impact on the fisheries sector in Palau. The report will detail present activities in the catching, gleaning, handling, processing and marketing of marine resources, identifying, if any, the factors that limit the development of these activities for domestic consumption or as income generating opportunities. Make recommendations on how to improve and develop these activities.

The report will also outline present organisational structures in these communities and evaluate if these can be developed and employed within any potential project framework. The report will analyse the potential benefits and drawbacks on the economic, social and cultural behaviour of the community when recommended activities are carried out.

## B. Specific

1. Conduct a survey of selected coastal fishing villages to determine:
  - a. the degree of involvement by women, as individuals or in groups, in the fisheries sector;
  - b. the specific type of fisheries activities (catching, gleaning, handling, processing and marketing);
  - c. type of products being handled, processed and marketed; and,
  - d. the social, economic and technical problems being encountered which may hamper these activities.
2. Identify appropriate development activities (technical, training, financial, etc) to assist women from coastal communities that:
  - a. will address the technical problems identified while catching, gleaning, handling, processing and marketing the marine resource;
  - b. will overcome the social and economic problems identified during the survey;
  - c. can be introduced at an appropriate technical level as income generating activities.
3. Through contacts with government departments, women's groups and other non-government organisations:
  - a. assess the availability of local resources to assist women in fisheries;
  - b. determine what external assistance may be required;
  - c. identify programmes in which women activities can be promoted and included.

4. To evaluate the impact that women's fisheries activities has on the economic, social and cultural aspects of Palau:
  - a. identify the economic advantages to women, their families and local community through increased participation of women in fisheries activities;
  - b. assess the impact of increasing fisheries activities on the women's work load;
  - c. define the social and cultural considerations that need to be taken into account in devising and implementing fisheries development activities and management measures.

[Note: If time allows I would like the consultant to collect details of processing procedures for marine products endemic to Palau]



APPENDIX 2

Date \_\_\_\_\_ Interview No. \_\_\_\_\_  
Interview Time \_\_\_\_\_

PALAU WOMEN'S FISHING ACTIVITIES SURVEY

Name \_\_\_\_\_ Age \_\_\_\_\_

Married\_\_ Single\_\_ Divorced\_\_ How many dependents: \_\_\_\_\_

Village: \_\_\_\_\_ State: \_\_\_\_\_

Do you fish/glean? Yes\_\_ No\_\_ Not anymore\_\_ Why? Explain

How long have you been fishing? \_\_\_\_\_

How many women in the family fish? \_\_\_\_\_

What are their names?

(Ask if they are children, adult or elderly)

What types of fishing do you use?

Mengduul \_\_\_\_\_

Omat a irimd \_\_\_\_\_

Olengims (Bor) \_\_\_\_\_

Gleaning \_\_\_\_\_

Hook and Line \_\_\_\_\_

Meluich \_\_\_\_\_

Kesokes \_\_\_\_\_

Spearfishing \_\_\_\_\_

Surround Net \_\_\_\_\_

Other: \_\_\_\_\_ Specify: \_\_\_\_\_

Are the other women in family using the same type of fishing as you are? \_\_\_\_\_ Do they sell their catch? \_\_\_\_\_

What other methods are they using?

GLEANNING

Activities	Mengduul	Olengims	Omatairimd
Where? Location Area of Reef			
Who usually go w/you? How many people?			
Do you use boat? outbd,raft,canoe,etc.			
How much time (hr) is spent?			
When do you go? Hightide,lowtide,both Time of day No. of times per month Any months that you DO NOT go? Which? Seasonal (moon, etc.)			
How much do you catch? How much is good catch bad catch, ave.catch)? (# of bags,lbs, etc.)	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____
How much do you sell? Where? Market, restaurant, indiv.			
How much (\$) per bag, lb. etc.			
How much do you keep? for family relatives other Use (e.g. bait)			
Other Species			

GLEANNING

Species			
Where? Location Area of Reef			
Who usually go w/you? How many people?			
Do you use boat? outbd, raft, canoe, etc.			
How much time (hr) is spent?			
When do you go? Hightide, lowtide, both Time of day No. of times per month Any months that you DO NOT go? Which? Seasonal (moon, etc.)			
How much do you catch? How much is good catch bad catch, ave. catch)? (# of bags, lbs, etc.)	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____
How much do you sell? Where? Market, restaurant, indiv.			
How much (\$) per bag, lb. etc.			
How much do you keep? for family relatives other Use (e.g. bait)			
Other species			

Methods

Activities			
What do you collect?			
Where? Location Area of Reef			
Who usually go w/you? How many people?			
Do you use boat? outbd, raft, canoe, etc.			
How much time (hr) is spent?			
When do you go? Hightide, lowtide, both Time of day No. of times per month Any months that you DO NOT go? Which? Seasonal (moon, etc.)			
How much do you catch? How much is good catch bad catch, ave.catch)? # of bags, lbs, etc.	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____	good _____ bad _____ ave. _____
How much do you sell? Where? market, restaurant, indiv.			
How much (\$) per bag, lb. etc.			
How much do you keep? for family relatives other Use (e.g. bait)			

Why do you go fishing or gleaning?

Sell/Market \_\_\_\_\_  
For Self \_\_\_\_\_  
For family \_\_\_\_\_  
Special Request \_\_\_\_\_  
Recreation \_\_\_\_\_

IF SELLING:

Do you always fish/glean for income? \_\_\_\_\_  
Sometimes, Why?

How often do you sell to a market in a month? \_\_\_\_\_  
What days?

Do you also sell for your husband or (male member of family)?  
If yes, what do you sell?

How do you transport the catch to the market?  
Own car/boat \_\_\_\_\_ Other's car/boat \_\_\_\_\_ State boat \_\_\_\_\_  
Other \_\_\_\_\_

How much money do you make in one year by selling seafood that you  
collect or catch? (Estimate if necessary.) \$ \_\_\_\_\_

Do you process and sell fish that your husband or brother catch?  
If yes, then ask how is it processed? (Smoked, fried etc).

What are the problems encountered in selling/marketing? Explain.  
(Transportation, etc.)

IF SPECIAL REQUEST:

Who orders from you?

(Name of restaurant, individuals, etc.)

How many times you collect for a special request?

\_\_\_\_\_ Daily \_\_\_\_\_ Weekly \_\_\_\_\_ Monthly

Any special species?

Are you paid? \_\_\_\_\_ How much?

FOR ALL WOMEN:

How many times a week does your family eat what you collect? \_\_\_\_\_

Are there any species harder to find now? \_\_\_\_\_

If yes, what are they?

Were they easier to find before? \_\_\_\_\_ When?

Are your daughters/sons collecting/fishing for the same things that you did when you were their age? YES \_\_\_\_\_ NO \_\_\_\_\_  
What is different?

Have you noticed any changes on the reef? YES \_\_\_\_\_ NO \_\_\_\_\_  
What are they? Where?

What do you think caused these changes?

How do you feel about these changes?

If foreigners came in to collect a lot of (cheremrum, etc.) what would you do?

What if you (or a woman's group) could decide who came here to collect, or if you or the group collect permit fees from these outsiders?

What would you do if you need help fishing or marketing? (e.g. who do you talk to, do you have meetings, etc).

What would somebody have to offer you in exchange for you to stop fishing forever?

What kind of help do you need, if any?

Do you have any comments?

## APPENDIX 3

### MARINE SPECIES COLLECTED BY WOMEN AND CHILDREN

The following references were used to identify the species in this appendix: Cannon and Silver, 1986; Division of Marine Resources, 1991; Helfman and Randall, 1973; Hill, 1978; Ilek, 1991; Johannes, 1981; Kramer, 1917; McCutcheon, 1981; Myers, 1989; Perron *et al.*, 1983; Snyder *et al.*, 1982; South Pacific Commission, 1979; and Wada, 1943.

#### ECHINODERMS

Sea cucumbers:

**bakelungal** (*Holothuria nobilis*): black. Prefers sandy slopes in water deeper than women can walk to. When smoked and dried this is most popular species for *beche de mer*.

**chederngor** (*Holothuria difficilis*): somewhat like *sekesakel* but the whole animal can be eaten.

**cheremrum** (*Actinopyga miliaris* or *A. echinites*): light (**ngemolei cheremrum**) or dark (**ngellau cheremrum**) color with anal teeth. The teeth distinguish this species from **choas** (*Holothuria atra*) which is not eaten by Palauans. Large, roundish body. May be found under rocks during the day or in the seagrass. Popular commercial and subsistence species. Collected and sliced in transverse sections once it has been cleaned of its intestines. *Beche de mer*.

**choas** (*Holothuria atra*): Black with no anal teeth. Some species have red ventral surfaces. Skin, when rubbed, emits a red liquid containing a nerve toxin that was once used to kill fish in shallow pools at low tide. Also used to lure octopi out of their lairs so they can be speared and to paralyze large sea anemones that are used for food. The paralysis makes the anemones release from the rocks. This species of sea cucumber is not eaten by Palauans, but other islanders collect them for food.

**irimd** (*Holothuria sp.?*): small sea cucumber found in seagrass.

**meremarech** (*Bohadschia argus*): white with reddish spots or orange with small white spots. Only the gonads and polian vesicles are eaten. Also eaten are the yellow "noodles" that come out after the white sticky tentacles have been expelled. This species is generally eaten while people are out collecting on the reef.

**molech** (*Holothuria scabra*): sand to black in color. Popular subsistence species, although occasionally it appears in the markets. Only the insides of large individuals are eaten, but juveniles are completely eaten.

**ngimes** (*Stichopus variegatus*): This sea cucumber is brown and green with small bumps.



Found in sand with seagrass (*Enhalus sp.*). Palauan name means "to stretch."

**sekesakel** (*Holothuria verrucosa* or *H. impatiens?*): small (~4"), brown or black with spines. Releases purple feeding tentacles when disturbed. Palauan name means "to be cut." This species is sliced longitudinally so the insides can be scraped out with one's teeth.

**sengill** (*Holothuria flavomaculata*): elongated, black sea cucumber that hides under the rocks during the day. Used to be eaten in Palau.

**teketekeol**: this term is used in Ngerchelung for a sea cucumber that is like **sekesakel**

**temtamel** (*Thelenota ananas*): reddish brown, covered with soft spines. Found in deeper water. Palauan name means "to chew". *Beche de mer*.

**tिंगlengel**: sea cucumber that lives in the mud just outside of the mangroves before the seagrasses start. One woman from Ngeremlengui said this species was eaten before but now she does not know anybody who knows how to get them. There maybe a special way to prepare them. Several women in Aimeliik have heard of this species, though all people asked in Koror had not.

Urchins:

**choalech** (*Diadema setosum*): black long-spined sea urchin

**duduomel** (*Toxopneustes pileolus*): sea urchin that looks spineless, white with pink spots. Used to be eaten.

**ibuchel** (3 species):

*Tripneustes gratilla* - purple with short white spines

*Hemicentrotus pulcherrimus* - white with a black star

*Strongylocentrotus pileolus* - reddish with brown and white spines

Very popular species for subsistence use. However, women in all states have noticed that these urchins are harder to find. They are collected only in June when they are ripe, or "fat."

## MOLLUSKS

Bivalves:

**chebau** (*Tapes literata*): lettered venus

**chedalngobel** (*Pitar citrina*): yellow pitar venus

**chesechol** (*Atactodea striata* and *A. striata f. glabrata*): sand clam found in the surf zone along shoreline. This small (~2 cm) white, or greenish clam is easy to collect, so pregnant women and those with small children can collect them. These clams are also gathered from the beach in bad weather as a needed source of protein when the seas are too rough to fish. Sold by the bag, about 100/bag. Cooked in their shells in soup.

**chesechur** (*Trachycardium flavum*): clam. Found between mangroves and reef in sandy areas where there is seagrass (*Enhalus sp.*). May be collected with **kikoi**.

**chesiuuch** (*Pinctada margaritifera*): black-lip pearl oyster

**dekmus** (*Haliotis asinina* and *H. ovina*): donkey's and sheep's ear abalone, respectively. Used to be collected in Palau.

**delal a ngduul** (*Anodonita alba* or *A. philippina*): large mangrove clam. "mother of ngduul"

**delebekai** (*Nucula rugosa* or *Gafrarium tumidum?*): nut clam

**eduib** or **debuongel** (in Melekeok) (*Polymeseda luhuana*): mangrove clam

**iud** (*Ostrea glomerata* or *Crassostrea echinata*): rock oyster

**ilekum** (*Codakia interrupta*): interrupted lucina (6 cm)

**kdor** (*Tellina virgata*): clam. May be eaten if it is cleaned well, however it is difficult to clean and is often used for bait instead of food. This species is eaten in areas of eastern Babeldaob.

**kerdaob** (*Periglypta (Venus) puerpera*): youthful venus; sand clam. Grows to ~11 cm. White shell with horizontal striations, inner lip of shell is notched all the way around.

**kikoi** (*Andara sp.* and *Barbatia reeveana*): ark shell. Hides just under the sand, above the layer of mud close to mangroves.

**kim** (*Tridacna spp.* and *Hippopus hippopus*): giant clams

**duadeb** - *Hippopus hippopus* - free-living in the sand, gray or brown mantle. Usually collected by women who generally refer to it as **kim**.

**otkang** - *Tridacna gigas*

**ribkungel** - *T. squamosa*

**oruer** - *T. crocea* - blue or green mantle, only species that lives in the rocks or coral. Often collected by women.

**kism** - *T. derasa*

**melibes** - *T. maxima*

**kim ra rechelid** (*Ostrea hyotis* and *O. crista-galli*): oyster. Eaten in Fiji. Used to be eaten in Palau since you can find shells around areas where houses used to be in the 1800s.

**ngduul** (*Anodonita edulenta*): thin-shelled mangrove clam. Major commercial species. Generally those individuals that are larger than 1.5" are sold in local markets and several Koror restaurants. Collected mostly by older women.

**olichel a sechou** (*Pinna spp.*): pen shells

**rrudel** (*Pteria penguin*): oyster

**sebuis** (*Atrina vexillum*): IndoPacific pen shell

**tiuach** (*Malleus malleus*): black or brown common hammer oyster, found on rocks near the mangroves. Used to eaten.

**uteuetech** (*Chama buddiana* and *C. sinuosa*): oyster. Budd's and smoothed-edged jewel boxes

Cephalopods:

**bukitang** (*Polypus spp.*): octopus. can be collected early in morning. Sometimes used for bait.

**luut** (*Loligo sp.*): squid. Palauan name means "backwards". Often used for bait.

**milengoll** (*Sepia latimanus*): cuttlefish, caught with hook and line

Gastropods:

**bsungel** (*Terebralia semestriata*): snails smaller than **delsangel**. Found on mangrove roots and rocks in brackish water

**buich** (*Cypraea tigris*): tiger cowrie. Live under rocks on barrier reef flat and fringing reef

**debusech** (*Charonia tritonis*): trumpet triton

**delsangel** (*Nerita (Amphinerita) maxima* and *N. undata* L.): snails collected from Rock Islands and Peleliu. Found attached to rocks at low tide.

**ibusech** (*Chicoreus ramosus*): giant murex

**itungel**: snail smaller than **delsangel** found on rocks on the beaches

**murech** (*Neritina (Vittina) turrita cumingiana*): turreted nerite (black & white stripes). Snail found in the mangroves.

**omuu** (*Cassis cornuta*): horned helmet

**ototel** (*Conus spp.*): cone shell. Found in sandy areas.

**rechiiil** (*Strombus gibberulus*): small white conch.

**sang** (*Lambis lambis*): spider shell. Collected from sandy areas near rocks.

**sang ra roech** (*Lambis chiragra*): spider shell. Found only on the barrier reef, so this is not usually collected by women unless they have a boat.

**semachel** (*Strombus luhuanus*): blood-mouthed conch

**semal** or **itol** (*Dolabella* sp.): sea hare

**semum** or **ekoek** (*Trochus niloticus*): top shell snail. Collected for food and pearly shell. *T. niloticus* is collected commercially and sold to Japanese for buttons, jewelry and trinkets. (avg. 100 mm) Eats thread-like algae on rocks and dead coral in and around patch reefs. Obtained only on the barrier reef especially around Koror, Ollei and Ngeremlengui (where fishing rights were spread out to other villages by the Japanese). (Johannes, p. 66)  
Moratorium on collection in some areas in effect until August 1992.

Polyplacophora:

**chечhui** (*Acanthopleura* sp. or *Chiton* sp.?): chiton

#### CRUSTACEANS

**chelauesachel**: mantis shrimp. Lives in holes in the sand. Lure made of a shrimp's claw or bait on a string is lowered into the hole. The shrimp grabs the string and as the string is pulled out of the hole, the claw lure traps it on the line. Marinated alive in a tray of coconut while the gleaners are out on the reef collecting.

**cheleched** (most common is *Thalamitoides tridens*, also collect *T. spinimana* and *T. danae*): crab. Palauan name means "already been poked with a spear" because of the way it is collected. Women like to eat it raw after it has sit covered for 1 to 2 days (**beraom**). Children like it cooked with coconut (**lius**). Men usually don't like to eat this crab.

**chemang** (*Scylla serrata*): mangrove crab. Fishermen follow fresh tracks that are made in mud but not in sand (tracks in mud are fresh since they are quickly obliterated by tidal flushing). Crabs live in burrows in the mud or in holes in logs during the spring reproductive season. Some mangrove areas swarm with juveniles from spring through early summer. Young and adults move into deeper water beyond the mangroves once their shells have hardened after their molt. Females are often found in sandy holes on the fringing reef, especially in channels (**debochel**). (Johannes, p. 191-192)

**cherabrukl** (*Panulirus* spp.): spiny lobsters; reef crayfish. Molt predominantly on neap tides. Three species are caught by men but may be marketed by women.

**raiklius** - *Panulirus penicillatus*

**bleached** - *P. versicolor*

**melech** - *P. longipes*

**cheramrou** (*Laemedia astacina* De Haan and *Thalassina anomala* (Herbst)): burrowing shrimp that builds mounds of mud in mangrove areas. Children and women used bait to

collect it. No longer eaten.

**cherechur**: shrimp. In rivers. Children stir up the muddy bottom until the water is cloudy. The shrimp go to the surface where they are easy to collect.

**chesechuul**: sand crab. Rarely eaten when other food is available. Eaten as **beraom**.

**kesuar** (*Gecarcoidea lalandii*): land crab with purple body and light colored claws. Collected any time.

**ketat** (*Birgus latro*): coconut crab

**kidl** (*Carpiliuss maculatus*): This tan crab with distinct red spots is found on the reef and in rocks.

**kmai** (*Portunus pelagicus*): Brown rock crab with blue spots and red claws, found on sand and in eel grass, gathered especially in Aimeliik.

**ksull** (*Paraxanthia elegans* or *Xanthias lividus?*): Many of these xanthid crab species are eaten but the large one without hair on its claws (**omyall**: *Atergatopsis signatus?*) is poisonous and may cause sleepiness and/or a comatose state.

**rekung, rekung el beab** or **rekung kakum** (*Cardisoma hirtipes*): land crab.

**rekung el daob** (*Cardisoma carnifex*): land crab (of the sea). Collected during the full moon.

**rereek** (*Grapsus tenuicrustatus*): black rock crab. Palauan name means "rustling". Gray/brown crab with yellow legs that lives in rocks. Can be eaten as **beraom**.

**senges** (*Neopisesarma lafondi*): gray crab with square body found on sand and in rocks in mangroves. No longer eaten.

#### CNIDARIA

**bung**: sea anemone. Palauan name means "flower"

**cheteremall** (*Stoichactis japonicus* or *S. haddoni*): sand-colored sea anemone. Sometimes eaten by Palauans.

**olaumeas** (*Actinodendron plumosum*): sea anemone.

#### SIPUNCULID WORMS

**chiull**: worm. A short, fat worm that lives in mounds underwater along sandy beaches. Pick, stick or shovel is used to dig up the worms that may be a foot deep in the sand. The worm is poked with a stick to turn it inside out to clean it. Used for bait or eaten with coconut milk.

**ngimer:** worm. A long, skinny worm that lives in the sand right on the beach. Women walk along the beach poking sticks in the sand to feel for the holes that the worms make. When the woman finds a worm, she grabs onto the end of the stick to keep the worm from falling off. The worm is pulled out of the hole slowly. Once it is out of the hole, the end is bitten and the insides are shaken out. If the insides are not cleaned out quickly, the worms will be full of sand and brittle.

#### FISH

**bebael** (*Siganus punctatus*): peppered rabbitfish.

**budech** (*Choerodon anchorago*): yellow-checked tuskfish (wrasse). spearfishing, hook & line, meluich

**cherangel** (*Naso lituratus*): orangespine unicornfish. spearfishing

**chibars** (*Scolopsis sp.*): spine cheeks. hook & line

**chudech** (*Lethrinus ramak*): yellowstripe emperor. hook & line or meluich

**chum** (*Naso unicornis*): bluespine unicornfish. kesokes

**dech** (*Mulloides flavolineatus*): yellowstripe goatfish

**eab** (*Carangoides fulvoguttatus*): yellow-dotted trevally. hook & line

**itotech** (*Lethrinus harak*): blackspot emperor. hook & line

**kedesau** (*Lutjanus bohar*): red snapper. kesokes

**keremlal** (*Lutjanus gibbus*): humpback snapper. hook & line

**kliklechol** (maybe **esiklechol**): tarpon

**klsebuul** (*Siganus lineatus*): lined rabbitfish. surround net

**meas** (*Siganus canaliculatus*): seagrass rabbitfish. Usually caught by spearfishing or meluich

**mechur** (*Lethrinus xanthurus*): yellowlip emperor. kesokes

**mekebud** (*Herklotsichthys quadrimaculatus*): gold-spot herring.

**melangmud** (*Lethrinus elongatus*): longnose emperor. kesokes

**mellemau** (*Scarus oviceps* and *S. rubroviolaceus*): dark-capped and redlip parrotfish

respectively. spearfishing and meluich

**metengui** (*Lethrinus haematopterus*, *L. mahsenoides*, *Gymnocranius japonicus*, *Pristipomoides sieboldii*, *P. filamentosus roseus*): *L. mahsenoides* is the yellowbrow emperor and *P. filamentosus* is the pink opakapaka. hook & line

**mirechorech** (*Epinephelus merra*): honeycomb grouper.

**ngiaoch** (*Hipposcarus longiceps*): Pacific longnose. spearfishing, surround net

**oruidel** (*Caranx melampygus*): bluefin trevally. spearfishing

**rekruk** (*Lethrinus amboinensis*): ambon emperor. hook & line

**rrull** (*Dasyatus melanospila*, *D. kuhlii* and *D. bennetti*): sting ray. meluich

**sekos** (*Strangyliva gigantis* or *Thalassosteus appendiculatus*): keel-jawed needlefish

**temekai** (*Epinephelus fuscoguttatus*): blotchy grouper. hook & line

**teber** (*Allanetta woodwardi*): hardyhead

**tiau** (*Plectropomus leopardus* and *P. areolatus*): leopard coral trout and squaretail coral trout, respectively. hook & line

**tungch** (*Balistapus spp.* and *Rhinecanthus spp.*): triggerfish

## APPENDIX 4

### GLOSSARY

<b>beraom</b>	raw seafood (especially certain crabs and fish) that are left to sit covered for a few days before they are eaten uncooked
<b>blur</b>	food dropped quickly into boiling water
<b>bor</b>	morning low tide; every month has eight; 2 groups of 4 days each
<b>ched el chei</b>	low tide
<b>chemadech</b>	uncooked or raw food
<b>chis</b>	Small deep water areas with few grasses, in the <b>uleiull</b> ; also called <b>ongeuidel</b>
<b>dermetaoch</b>	areas inside the mangroves
<b>ebiei</b>	seeded breadfruit, <i>Arpocarpus marianensis</i>
<b>elais</b>	basket especially woven for fish
<b>elchol</b>	sandy beach
<b>elmoll</b>	high energy zone where surf breaks on the reef
<b>eluit</b>	cooked food; served in coconut milk
<b>illoil</b>	non-living rocks in the <b>elmoll</b>
<b>keburs</b>	mangrove areas
<b>kereker</b>	the entire area from the beach or mangroves to the sand flats
<b>keremerem</b>	moonless night
<b>klou el chei</b>	high and low spring tides; tides get very low
<b>lemau</b>	deep pools in the reef surrounded by coral
<b>lkes</b>	sand flat



<b>lalou</b>	edge of the mangroves without seagrasses
<b>melkesokl</b>	patch reefs
<b>mengesiau</b>	when a person sees other people fishing with kesokes (seine nets) and goes out to help and receives a portion of the catch
<b>mengeai</b>	neap tide
<b>merk</b>	flat surfaces on the reef before wave brakes
<b>metemall a chei</b>	change over from low spring tides to <b>mengeai</b>
<b>ngeraol</b>	after deep water and before shallow areas next to the reef
<b>ngeuaol</b>	everything outside the barrier reef
<b>odoim</b>	non-starchy food, especially fish and meat
<b>omur</b>	cooking by quickly dipping food in boiling water
<b>ongraol</b>	starchy food: taro, tapioca, sweet potatoes and rice
<b>ongduoll</b>	area near the mangrove forest for collecting mangrove clams
<b>orakiruu</b>	full moon
<b>rael</b>	passes through the reef
<b>retech</b>	shallow areas right before going up the reef
<b>riamel</b>	football fruit tree; <i>Bangius edule</i>
<b>rsaol</b>	shallow seagrass area where rocks start, before deep water
<b>saru</b>	quart or half-gallon container (usually plastic) that has holes; used to collect <b>ngimes</b>
<b>sualou</b>	general term for a coconut frond basket
<b>tab el buil</b>	new moon when it is first visible as a sliver
<b>tab el chei</b>	low tides during the new and full moons

<b>tarai</b>	large basin
<b>titimel</b>	amra tree, <i>Spondias pinata</i>
<b>tkulatoachel</b>	area next to deep water channels
<b>toachel</b>	deep water channel
<b>uchul a ducher</b>	areas inside mangrove forests near the leafless shoots of the mangrove trees
<b>uet</b>	deep spots within the seagrass area of the lagoon that do not get dry when the tide is really low
<b>uleiull</b>	exposed muddy areas where streams empty into lagoon; this is a good place to find mangrove clams

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