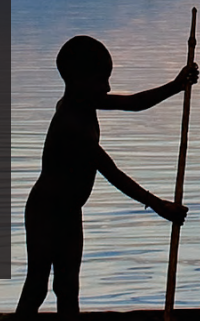


# 4 VOYAGING AND SEASCAPES

To the Pacific islanders, the waters that separate them are also a factor that connects them. Bearing this in mind, the four themes in this section offer a glimpse into the need to hold mastery over the sea for survival—for the fish that sustain the people and for the creation of pathways to connect them. Through extensive interisland trade, the ocean pathways maintain and sustain relationships for political, social, educational, economic, and most of all, spiritual benefits.

In “Palauan Knowledge of the Sea,” for example, we see how extensive methods and nuances of fishing and oceanic knowledge are part of both the livelihood and identity of Palauans. Similarly, by examining the Yapese knowledge related to canoes and ocean voyaging, we can see the effects and importance of inherited know-how on the connected lives of Micronesians through the ages and today. In these and all the themes in this section, we see how expressions by custodians of cultural know-how and development of sophisticated navigational systems have allowed Pacific islanders to travel safely and interact with the ocean and each other. Pacific navigation is perhaps one of the most singular human achievements of humanity.







# PALAU KNOWLEDGE OF THE SEA

ANN K. SINGEO

*Tekoi a ua edesaoch.*

*(Like the waves of the ocean, knowledge of the sea comes in various sizes and shapes, each headed in the same destination, but never will one wave overcome another.)<sup>1</sup>*

—A Palauan proverb

The ocean has sustained Palauans' livelihood since the beginning of time. Understanding of the ocean means that they not only relate to its changes with the wind or tide, or even the moon, but can also smell and feel the change on their skin before or as it takes place. The collected information here is representative of knowledge from informants coming from various places in Palau, mostly Ngarchelong State. Even as they feel the tide coming in, they can recall that certain fish may be spawning at that very moment. This is what developed fishing knowledge entails. Palauans today still use legends to teach origins of knowledge such as fishing. Within the knowledge, behaviors or characteristics of marine species are identified and used to determine fish habitats and life cycles and oftentimes the name of the species.

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1. This proverb is used among fishermen in Palau as a humble reminder that promotes respect of each other's knowledge of the ocean.

Fishing, like other indigenous knowledge, becomes a character of a village as the natural resources available to that very environment dictate the cultural practices to be mastered by those who belong to that village. Those with the vast and rich ocean resources have mastered the fishing knowledge more than others without the same ocean riches. Places in Palau known for having expanded ocean resources include Ngarchelong, Koror, and Peleliu.

In Palau, the ocean is for the men to master and manage. Although women participate in the gleaning or gathering of seafood in the shallow coastal areas, their trips to the sea are less frequent and more for the purpose of leisure and retreat. Still, their closeness to these particular habitats gives them direct interest and knowledge of its characteristics and connection to the larger fishery. For example, a female interviewee, Eunice Olsudong, notes, “Where there are less invertebrates and crustaceans, there’s less fish.”<sup>2</sup> Whether or not she understands the scientific correlation between the two, she still uses the invertebrates as an indicator for good fishing grounds.

## TRADE WINDS

The trade wind is what separates the two main seasons of Palau—the rainy season and the dry season. Palau’s indigenous language refers to the trade winds as *rak*. The term “rak” has also been adopted and used as “year.” However, the reality is that a rak is merely six months of the year. From the month of November until April is one rak, of the Easterly Winds. Subsequently, from the month of May until October is the second rak, of the Westerly Winds. Because the Palauan calendar consists of the sun, the moon, and the winds, the same terms were adopted and used to translate the Western calendar. The translation is as follows: *sils* or sun—day; *buil* or moon—month; and *rak* or trade winds—year. For the purpose of this paper, we will be using the term “rak” in its original meaning of “trade winds.”

During the Easterly Winds, or Rak er a Ongos, the climate is dry and very windy. It is also during Rak er a Ongos that typhoons are of greater possibility. Palau seldom gets typhoons compared to other island countries in the region, like the Philippines, which are only 400 miles from Palau. During this time the villagers of Palau on the

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2. Eunice Olsudong, personal interview with author, 2014.



east coast of Babeldaob will rarely go out to sea and will practice the types of fishery that do not require use of boats, such as *kesokes*, or “gill net,” and *bidekill*, or “throw net.” Those on the west coast of Babeldaob do not necessarily receive the same intensity of winds and can still participate in alternative fisheries as they have a vast reef with diverse habitats. A Palauan saying is that villages in the west are *medinges el beluu*, or bountiful villages.

During the Westerly Winds, or Rak er a Ngebard, the climate is wet, but calm. Fishing conditions are favorable for most of Palau as the sea is calmer and cooler, both of which make for productive fishing. It is during these trade winds that trees are also flowering and fruiting, and Palauans would say that the trees are pregnant and the wind is being considerate not to shake up the trees too much or possibly cause interruption of maturing fruits.

Understanding of trade winds and seasons allows fishermen to predict the weather effectively and plan for appropriate fishery activities.

## LUNAR CYCLE

The lunar cycle is critical knowledge for effective fishing. Knowing the relationship between the moon and the tide informs the fishermen of tide differentials and fish behavior as well. For instance, when the moon rises, low tide begins, and as it passes the center or directly over our heads, the tide begins to return, or high tide begins.

Fish life cycles are observed and identified against the lunar cycles as well. By this, the fishermen know exactly when and where to go out to get a certain species of fish. For instance, according to Rteruich Katsushi Skang from Ollei, Ngarchelong, regarding the life of a hump-head parrot fish, “They begin to gather during the seventh and eighth waning moon, travel out to aggregation channels by ninth waning moon to spawn, and return to their usual habitat.”<sup>3</sup> Tino Kloulechad from Ollei, Ngarchelong says, “Every fish spawns every thirty days.”<sup>4</sup> He explains that every fish species has a specific spawning day within the lunar cycle and will always return to that specific reef area to spawn every thirty days; for example, rabbit fish

3. Rteruich Katsushi Skang, personal interview with author, 2014.

4. Tino Kloulechad, personal interview with author, 2014.

spawn every sixth day after a new moon. Kloulechad also noted that most fish spawn during neap tide, referred to as *koseks a chei*.<sup>5</sup>

From the new moon to eighth moon is referred to as the “Western Moon” as the moon is first sighted in the evening in the western skies. It is also during this point in the lunar cycle that it is low tide during most of the morning and high tide in the early evening. From the ninth to the fifteenth the moon is bigger and brighter, and fishermen are getting good catches as fish are more active and their appetites are improved. The period after the full moon, lastly, is referred to as *kermerm*, or “loss of brightness.”

## HABITATS

The various habitats provide fishing grounds for the varied marine species, determining the type of fishing gear or techniques to be used. Beginning from the coastal area, the habitats vary depending on which part of the island one is situated. The east coast of Babeldaob is shallow and narrow while the west coast is deeper and has wider reefs. Legend has it that when the giant goddess fell down to create what became most of Palau today, she faced the west on her side and created the reefs of the west further out to protect her organs while the east is of her backbone and has the strength to handle the constant thrusting of waves rushing ashore. Below is a list of the habitats in the Palauan language from coastal to open sea.

- *Kebokeb*: This is the mangrove area along the beach, next to land. It is an area within which various marine species are collected such as mangrove crab and mangrove clams (*ngduul*, *dubuengel*, *delbekai*, *kdor*). Women collect clams while men trap or spear mangrove crabs.
- *Lalou*: A *lalou* is a mote or deeper waterway usually after the mangrove forests, underneath the mangrove tree branches and before the sea grass begins. This area is a passage for fish and provides a place for a certain art of fishing using spears while sitting on the tree branches.

5. Ibid.

- *Kerker*: This sea grass bed is where women collect seafood such as invertebrates and various types of clams, including fishing for small snappers. Men use throw nets and gill nets to fish for various types of fish, especially rabbit fish (*meas*, *kelsebuul*). Juvenile turtles and sharks also feed in this area.
  - *Uet*: *Uet* (pronounced “wet”) is the area within the inner reef that consists of swamp, sea grass areas, sand beds, and coral patches, where the tide never gets too low and provides for a rich biodiversity due to the varied habitat and food source for marine species. Within a uet, marine species to be found include invertebrates, clams, rabbit fish, parrot fish of many kinds, turtles, sharks, etc. Uet provide an important habitat for juvenile fish. They are areas where line fishing and spear-gun fishing are both used, along with fishing weirs or *beng* where stone walls are created to trap fish.
  - *Rael sab*: *Rael sab* (called *rael mlai* in Desbedall) is a deeper area also within the lagoon with long sea grass and corals within the kerker where giant clams and larger fish are found. This is an ideal area for casting of small fishing lines, a fishing technique commonly practiced by women and men, particularly those from the east coast of Babeldaob.
  - *Lemau*: *Lemau* are blue holes in the inner reef with large corals. “Lemau” comes from the word *mellemau*, meaning blue. This is rich fishing ground inhabited by larger fish and turtles. A spear gun is the gear mostly used in this area, including for bottom fishing.
  - *Bkul a rsaol*: This is the sea crest that divides the fringing reef and the lagoon. This is where coral groups increase and long sea grass exists. It is a place for spear-gun fishing and some line fishing.
  - *Rsaol*: This is the lagoon where bottom fishing is the main activity along with spear-gun fishing and turtle hunting.
  - *Melkesokl*: *Melkesokl* are patch reefs and are mostly fished using bottom fishing and spear fishing.
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- *Ellemoll*: The barrier reef where, during low tide, trochus is collected on the Oreall, or coral bed. Spear fishing is used here for fish trapped in pools, and even lobsters are caught here.
- *Ngeuaol*: This is the open sea, where trolling is mostly the way of fishing.

## FISHING TECHNIQUES

The various fishing techniques are segregated between the male and female fishery techniques. Women's fishery, as mentioned previously, is concentrated in the shallow coastal areas, whereas men's fishery begins from the mangrove and extends all the way out to the deeper reef areas. Fishing techniques have pretty much maintained the same knowledge and application though the tools have changed.

The following descriptions provide explanations of the fishing techniques and the habitats to which they are applied.

- *Kereel*. Bottom fishing takes place in the lagoon all the way to the deep sea and targets reef fish that feed on worms and other small sea-bottom creatures including small fish, and, as such, will use tackle with a baited hook. Tools used for this type of fishing began with the use of line made from hibiscus tree bark and hooks made out of shells and wood. This type of fishing is also practiced by women within the shallow coastal sea grass. Women's fishery is not a responsibility or obligation toward the family food security but merely for recreational purpose. Today the fisherfolk have adopted newly introduced and more advanced materials such as malleable fishing lines and hooks (Figures ① and ②).



① Contemporary fishing line. © Ann K. Singeo

② Camp Ebiil participants with their catch from bottom-line fishing in Ngarchelong. Camp Ebiil is a local indigenous knowledge education for youth toward protection of Palau's culture/nature. © Bridget Adachi



Hooks and fish traps were designed with plants that are durable and resilient to moisture but with enough flexibility to be used as part of a design.

- *Chetakl*. Trolling is conducted in the open sea or deeper reef areas using stronger and heavier lines with artificial lure or fish bait (Figure ③). In other parts of Palau such as Hatohobei Island, the fishermen fly kites attached to their trolling lines as sails. Big migrant species of fish, such as wahoo, barracuda, tuna, sail fish, and other bill fish, are caught mostly during trolling activities. Fish life cycles are also used to determine the migration of such fish throughout the reefs of Palau. Lagoon birds such as the black noddy and white tern along with other lagoon birds are observed as indicators of fish schools targeted during trolling.



- *Balech*. Spear-gun fishing is a contemporary fishing practice adopted from the traditional diving and spearing of fish, or *merus a ngikel*. Today, with more advanced techniques and tools, the fishermen use spear guns that are designed with metal and rubber to create a trigger for faster and deadlier impaling (Figure ④).



- *Burech*. Spears are used during net fishing and also during *tuich*, or night fishing, when tides are low. “Tuich” simply means “torch”; torches were used as lights to locate the fish to be speared (Figures ⑤ through ⑦). A spear is made with bamboo and wood from betel-nut tree trunks or other hard wood. Today they are made with bamboo and metal, as shown in Figure ⑦.



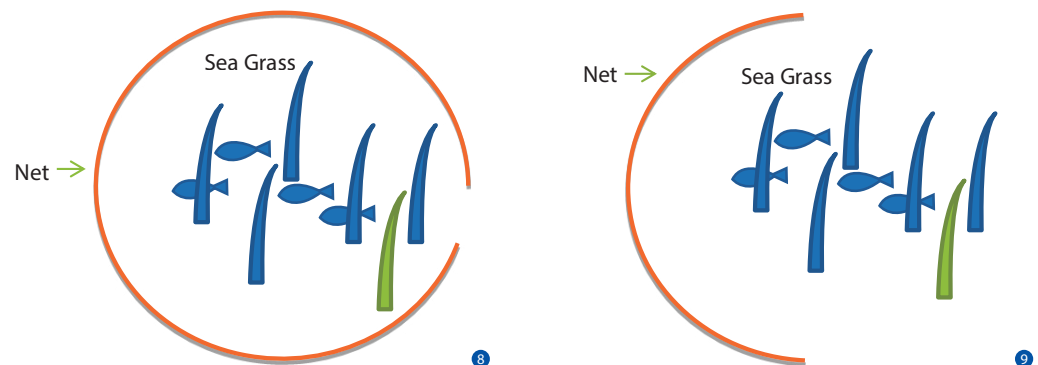
④ Spear gun. © Ann K. Singeo

⑤ Traditional spear made from bamboo, coconut lash, and wood. © Belau National Museum



- *Net Fishing*. Gill net fishing is used for two types of fishing techniques. It is used during *omelebed* and *kesokes*. *Omelebed* is when the fishermen would use the net to round up the pools of coral where fish would likely be feeding during low tides (Figure 8). As the fish try to swim out they are caught in the net, and a spear is again used to get fish from the net. Once the fish school is spotted, the fishermen would take each end of the net and run toward the fish, eventually coming to make a circle with the net and the fish in the center. *Kesokes* is when the fishermen would set the net toward the end of high tide and in front of mangroves or sea grass where fish would rest at night in order to trap the fish on their way out with the low tide (Figure 9). Once the tide is low and the fish have been caught in the net, the men utilize the spear to get the fish from the net.





Figures ⑩ and ⑪ show some of the participants of Camp Ebiil 2005 weaving a *ruul*, the traditional implement used for the above-mentioned fishing technique. *Ruul* is made using vines and palm leaves woven along the vine (*demailei* and *kebeas*).



*Bidekill*, or throw net, is used to fish for rabbit fish (*meas*) and sardines (*mekebud*). Figure ⑫ shows Tino Kloulechad with his throw net on his way to fish in the nearby sea grass area. Rabbit fish spawn and spend most of their life spans in the sea grass area, where they are harvested by the fishermen using either throw net or gill net. Understanding of their behavior allows for the fishermen to successfully catch the fish at the right place and time. Rabbit fish harvesting is ideal in Koror and Airai, where the fish are at their biggest size by the time they travel to those two states of Palau.

*Omodk a uesachel* is a fishing technique hardly practiced by fishermen today except for a few. The target species is *chelauesachel*, or crawfish, which inhabits the sea grass area in a burrow in the sea

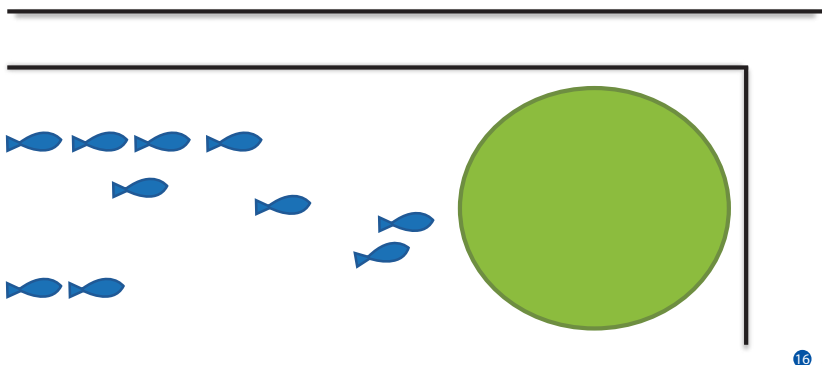
bed (Figures 13 and 14). The objective is to lure the crawfish with bait on a hook tied to the end of a stick that's long enough to reach into the burrow.



- *Omub*. Fish traps are also used in sea grass areas in pools or in the mangrove area, where fish would normally congregate and feed (Figure 15). The trap is made from roots of *raod* (*Rhizophora apiculata*), a mangrove tree. Traps are used for catching reef fish and mangrove crabs. Figure 15 shows the trap, or *bub*.



- *Beng*. *Beng*, or fish weir, is a stone wall built on the reef as a trap for fish. Fish are speared during low tides, when the fish are trapped after the tide goes out. Primary interviews identify remaining *beng* to exist in Ngeremlengui and Melekeok.<sup>6</sup> In Ngeremlengui, the *beng* is placed in the sea grass and coral bed in front of a village next to the channels, whereas in Melekeok it is placed at the front of the Barrier Reef. Figure 16 demonstrates the stone fish trap.



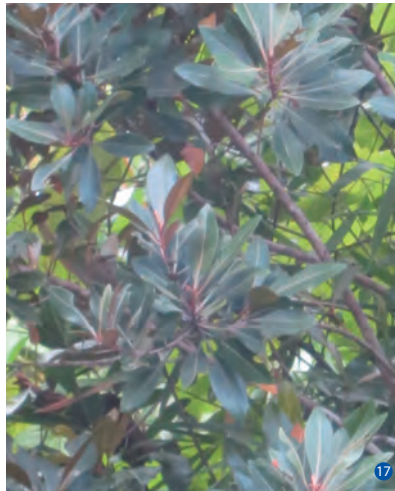
6. Peter Elechus, personal interview with author, 2014.

13, 14 Fisherman showing his catch of *chelauesachel* (crawfish). © Meked Besebes

16 Diagram of traditional fishing weir, *beng*. © Ann K. Singeo

15 Traditional trap made from mangrove tree root (*raod*). © Belau National Museum

Plants traditionally for fishery include the previously mentioned vines and palm leaves and the following plants that are native to Palau's tropical forest: *chelangel* (*Pouteria obovata*), *kerdeu* (*Ixora casei*), *cheritem* (*Atuna racemosa*), and *tebechel* (*Rhizophora mucronata*). These plants show resilience to moisture and allow for needed flexibility. All are native to Palau and can be found in the upland forests and mangrove forests. Photographs of identified plants are shown in Figures 17 through 20.



Women's fishery, on the other hand, is concentrated within the coastal areas of the sea grass and mangroves. Collection of clams, shells, and sea cucumber (*Holothuroidea*) is their main fishery. Tools used for this fishery mainly involve knives and baskets. Baskets are made from coconut leaves right before going out and are usually still green, with ferns laid on the bottom to keep seafood from falling out and to tenderize the sea cucumber, which can be tough to chew on.

17 *Chelangel*, northern yellow boxwood (*Pouteria Obovata*). © Ann K. Singeo

18 *Kerdeu* (*Ixora casei*). © Ann K. Singeo

19 *Cheritem*, parinarium nut (*Atuna racemosa* subsp. *Racemosa*). © Ann K. Singeo

20 *Raod/Tebechel*, mangrove tree (*Rhizophora mucronata* Lam). © Ann K. Singeo





This fishery is conducted when it is low tide in the early morning and the sea cucumber vesicles are clean and without sand or other impurities. It is also during this time that they are fatter and tastier.



Women's fishery is a leisure activity that women participate in as friends or a group to catch up on things and eat lunch outdoors. It is not an obligation or responsibility as men's fishery is.

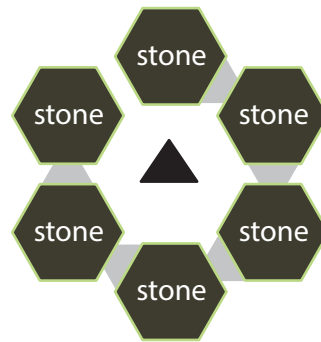
Finally, as a tradition, the elders in the community kept their eyes on those who went out to sea as a part of safety. As such, there were always elders who spent their days at the boat house or mooring

21 *Mengduul*, women's fishery, in the mangrove area. © Ann K. Singeo

22 *Ngimes* that women cut to remove the edible intestines when the species has released the sand from within the intestine. © Ann K. Singeo

23 *Olengimes*. Ulang Skang cutting a sea cucumber to get the intestine. © Ann K. Singeo

house to keep head counts of all fishermen or vessels that went out to sea. In instances when the fishermen needed to be called in to shore for emergency purposes, a *klekat*, or smoke signal point, would be lit to create a smoke signal to call the fishermen home. This practice is most recognized in Ngarchelong, where there are a total of five *klekat*, known corresponding to the various reef areas in the Northern Lagoon. There are no other *klekat* recorded for this purpose in other states. Individual *klekat* are designed with specific height and size to correspond to the specific reef's distance to land. For example, the further the reef, the bigger the platform. Figure 24 depicts the platform.



24

The circular stone platform surrounds a triangular stone in the center that allows for oxygen to enter the center of the fire. Wood and coconut leaves are placed within the platform's entirety in order to create the needed size of fire and smoke. Green leaves are placed on top to create thicker, darker smoke that can be recognized from a distance.

This is just some of the knowledge associated with Palauan fishery that a successful fisherman must accumulate over time as part of mastering the knowledge of the ocean. The knowledge continues to change with time and with new technology. While the tools and techniques advance, the foundations of mastering ocean knowledge as a successful fisherman remain the same.

Fishing knowledge currently remains a family heritage and is passed on from one generation to the next. However, the Ebiil Society is one organization in Palau that has been providing training programs on Palau's fishing knowledge since 2005. The organization is a civil

society organization, and the program is mainly organized during summer vacation and for specific school programs as requested.

Palau's knowledge of the sea incorporates understanding of our own environment and ecosystems, including conservation practices. These important values and principles are built into the practices, and as a person matures in his or her level of fishing skills, so does his or her sense of responsibility for resource management. In order for Palau to sustain this important knowledge of the sea, the development of such training programs must be included in the current education strategies.



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