

Cultural, subsistence and commercial fisheries in reef ecosystems

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Return from *mikwaa* (*Chanos chanos*) fishing, Isle of Pines. © J. Tikouré

For the inhabitants of New Caledonia, the reef is much more than a coral colony, a reef flat or a barrier reef. The reef encompasses the lagoon and its inhabitants, its passes, living beings, souls, stories and memory. For Kanak people, this space is both an invisible and a visible world. The invisible world is where the ancestors live, where the paths lead to the kingdom of the dead. The visible world is experienced and known through fishing practices, among the other things that make up the daily life of many on the "Pebble" ("Caillou" in French, the popular name of Grande Terre). Along the coastline, there is no village or tribe for which fishing is not important. These fishers are men and women, young and old and from diverse

backgrounds. They fish for food, to maintain connections with their environment, to strengthen and renew ties between families, clans, and tribes or simply for recreation. Many New Caledonians have "grown up in fishing". Their parents were fishers who transferred their knowledge, their fishing techniques and, above, all, their passion for spending their time at sea.

The fishing practices and the importance of this activity for the inhabitants of New Caledonia raise so many questions that one book would not be enough to fully cover the topic: who is fishing and for what? Are there different fishing techniques? What are the target



Wood sculpture representing the head of a *mikwaa* (milkfish), Isle of Pines. © M. Juncker

species and the quantities collected? How do we know the species that inhabit the reef and their behavior? How do you build a “reef experience”? What is the importance of reefs for fishers from different backgrounds? How are fisheries organized in each territory? What are the social, cultural, symbolic and economic values of the New Caledonian reefs in the eyes of its inhabitants?

Researchers in anthropology, ethno-ecology, and geography are working on these questions. Several research projects have contributed to a better understanding of how New Caledonian people think about this environment and how they use it. This research offers a modest contribution from human and social sciences to characterize lagoon fishing and talk about the fishers who practice it, thereby revealing the importance of coral ecosystems for New Caledonians.



A fisher observes the lagoon, bay of Upi, Isle of Pines. © P.-A. Pantz

Knowing the reef and building fishing experienter

For many, fishing is a common practice that requires careful observation. The experience is daily for some, regular or less common for others. Fishers know the reefs, they name them, they classify them. They also know how to decipher their environment and will choose a fishing spot according to tide, season, weather, etc. They acquired this field knowledge through the observation of the elders: "it is by going out to sea with the elders that we learn to fish". They scan the surface of the lagoon from the beach, from their boats, or even from the top of a pirogue mast to locate a school of fish or a particular species.

Observation is what every fisher talks about when he or she learns to fish: "First, I look." Fishers are very familiar with the reef and they use various "markers" to ensure good fishing.

- A sea krait swimming at the surface is sign of isolated reefs with fish;
- A flock of seabirds indicates the location of a school of fish;
- Unusual rippling of the water surface reveals the presence of pelagic fish;
- The massive stranding of small crustaceans in Prony Bay indicates the presence of schools of mackerels;
- After a tropical cyclone, large-eye seabreams, short-nose unicornfish and long-nosed emperor readily bite at the line, while Spanish mackerels dive deep into the depths.

“Below the terns there are anchovies, and therefore Spanish mackerels; below the petrels there are large sardines.” (Koumac)

For many New Caledonians, fishing techniques are learned with the elders. The knowledge of fishing spots is shared by relatives and sometimes new ones are discovered after intensive searches: places where reef fish congregate, "lobster rocks", or "octopus caves", etc. Fishers know where the short-nose unicornfish are and when they are fat. They even observe changes in their behavior at sites regularly visited by fishers. Their observations also attest to the resource depletion or the disappearance of fish schools from sites where they were abundant in the past (rabbitfish, short-nose unicornfish, long-nosed emperors, groupers, etc.)

“There is less fish. Me, when I had the other tiny [tin boat] to myself, alone, I fill the icebox. Now, at five or six, we never fill the icebox.” (Pouebo)

Box 24

From the knowledge of the elders to GPS

“I fish in relation to places, for fish, for crab, for everything. I use a GPS now... Before, our Elders, they didn't teach us with GPS, we used mountains for landmarks.” (Koné)

“Before, our Elders, they show us the rocks [sic] but it was secret.” (Koné)

GPS is an increasingly widespread instrument that is transforming the knowledge of places. It is valued by fishers, especially for those who go far offshore and it is defining new ways of communicating fishing grounds. In Bélep, for example, for young fishers targeting sea cucumbers, GPS makes it easier to explore new areas that had not been visited since their grandfathers with their sailing boats. It is a new tool that challenges the production of knowledge and its transfer to new generations.

The observations that fishers collect (passed on or learned) over years, decades and sometimes even generations, build up a "knowledge", a fine understanding of the reef and of the behavior of the organisms that inhabit it. Today, this knowledge is also of interest to marine biologists and ecologists because it assists them in locating migration corridors, identifying reef fish spawning periods and areas, etc.

Knowing where to fish and being respectful of each other's territories

“There are several of us fishing here. Here at home, among Kanaks, it's forbidden to cut in front of someone else, so we go to small places where there's no one.” (Poum)

“When professional fishers came to work in the fishing business, it was done quite naturally. We [professional fishers] don't go on the reef flats, because it's dangerous enough to get close to it, but also out of respect for those who don't have boats, those who will walk to cast their nets or fish on the reef. It was done quite naturally: there was no meeting to organize fishing grounds, etc.” (Lifou)

When you are a fisherman, whether you are Kanak or not, there are a number of implicit "rules" about how to use fishing grounds. The "first on the spot" rule is one of the most common. In addition, while barrier reefs and remote isolated reefs are privileged fishing grounds for boat-owners, especially professional fishers, reef flats and fishing grounds close to residential areas are reserved for subsistence fishers.

Fishers name both species and the places where they can find them. Toponymy thus applies to the seascape. Some islets are taboo and can be surrounded by mists so approaching them can be risky. Places that should not be visited are also named. For example, the small "Peto" Reef ("pillow" in Numée language) in the south of Ouen Island, in the Southern Lagoon (Grand Lagon Sud) is a taboo reef. The reef is the pillow of the Wakôdô shark, guardian of the island, and must be preserved from any fishing.

Box 25
Taboos on fishing grounds

In New Caledonia, taboos on fishing grounds are numerous and diverse and they always imply a ban on access or removal. They may apply to all inhabitants of the island or only certain tribes or individuals. A clan or person may be entitled to temporarily remove these bans in order to organize, for example, a collective fishing trip for a particular event such as a wedding, investiture of a chief, yam celebration, etc. While the primary function of these bans is social, they also benefit the preservation of marine wildlife.

Tool selection according to location and type of practice

The type of fishing practice generally depends on where people live, their resources, their knowledge, their profession, their duties and so on. It is common for several tools to be taken on board the tiny (tin or light aluminum boat) to be able to adapt to the fish species available at the fishing site, or even to their behavior.

Reef flat fishing aims at collecting shellfish and octopus. While men are not absent from this fishery, it is mainly a fishing practice of women and children.

Angling is often carried out on the soft bottom of the lagoon, at the edge of a fringing reef flat with rising tide, or near isolated reefs for catching species living on the bottom, or close to the bottom, such as large-eye seabreams (*Lethrinidae*). It is carried out by both men and women.

Spear guns are used by young and old to target the most common reef fish (parrotfish, groupers, etc.) throughout the lagoon, from the coast to the barrier reef, in the passes and outside of the lagoon. Rock and slipper lobsters are caught by hand while free diving or using spear guns for the biggest specimens.



The tide is good, the net is ready to cast. The fisherman is looking for rabbitfish on a reef flat. Goro Bay, Yaté, 2009. © M. Juncker

Bare hand gathering, and free diving is also practiced for the collection of some shellfish such as trochus and giant clams, as well as holothurians (*bêche-de-mer*) for the Asian market.

Fishing nets, especially the seine and cast-net, are used for gregarious fish species that occur in shallow water (usually one to seven meters deep) such as the short-nose unicornfish (*Naso unicornis*), rabbitfishes (*Siganidae*), mullets (*Mugilidae*) or white fishes (strongspine silver-biddy, milkfish or *Gerres longirostris*). Seines are often reserved for "experienced" fishers; young people usually fish with spear guns, troll or fishing lines, and children often start learning how to fish by hand on the reef flat and later with a fishing line from a boat.



Cast-net fishing, Brosse Islet, Isle of Pines. © P.-A. Pantz

Fishing to exist, trade, feed and sell

"Our field is on the reefs."

These words have been heard in various places in New Caledonia and refer to both current and ancient representations of the role of reefs in the lives of fishers, especially the clans of the sea. Knowing the importance of the field, and particularly the importance of yams for the Melanesians, we understand the value of this statement.

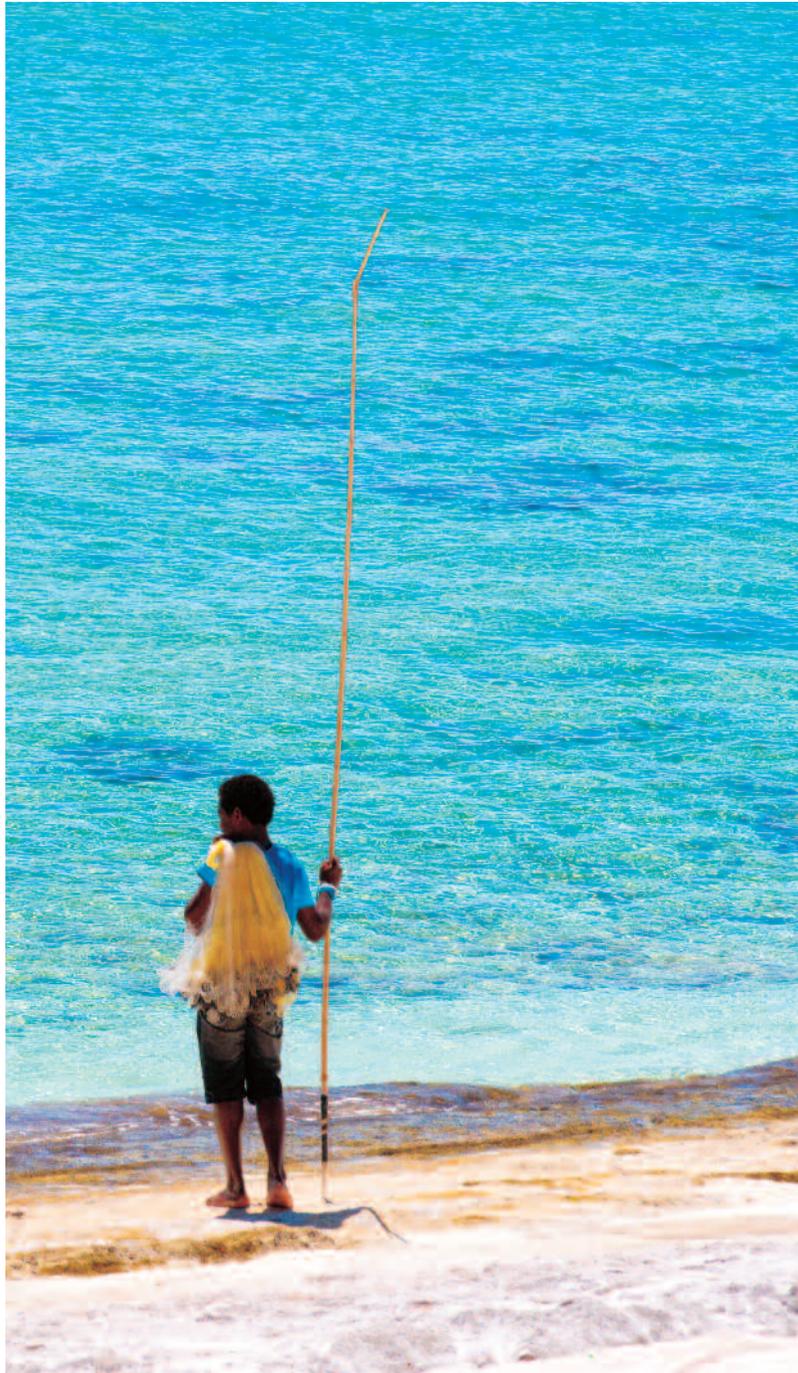
Fishing plays a fundamental role in the organization of Kanak societies. It reinforces the ties between clans through exchanges and is the identity of the fishing and sea clans: it is a duty they have to accomplish for the respect of their chiefdom and the other clans. The product of their fishing is handed out to the chiefdom or shared during customary ceremonies. Fishing is also important in non-Kanak

societies, but in different ways. Being able to provide a guest with lobsters or certain large species is rewarding and for religious events, some fishers are relied upon for their catch.

«"I'm trying to keep fish in the freezer because we have people from the [mountain] chain coming by any time to get fish for customs up there." (Hienghène)

"Before, since I was a little girl, I used to fish on the reef flat with my parents. To make things better, I took a boat so that I could travel a little further. The first idea was to provide to those in the [mountain] chain: fish and trade with them. Instead of selling, we trade. [...]. They make [give] us what is found [grows] in the range: taros, cassava..." (Gomen)

"There's xalaïa, donations for the pastor every first Monday of the month. If you don't have any coins, you bring fish; if you don't have rice or fish, you bring coins. Or yams, cassava, bananas." (Poum)



Fisher with a sagai and cast-net. Doueoulou, Lifou. © P.-A. Pantz

Fishing has a special place in the diet and daily life of New Caledonians. It is important to remember that the only sources of animal protein before the introduction of deer and pigs were birds (notou, kagu, etc.), flying foxes (bats) and marine resources. In 2011, a survey of people living in tribes²¹ revealed that over half of the families living on customary land practiced fishing: 57 % of households had at least one fishing activity in 2010. A total of 2,730 tons of seafood products were taken from the reefs by the Kanak people living in tribes including lagoon fish, crabs, lobsters, shellfish, octopus, bêche-de-mer. On average, fishing represents 370 kg/year/household, with figures reaching 586 and 572 kg/year/household in Ouvéa and in tribes of the far north (Belep, Pouebo, Ouégoa, Poum and Kaala-Gomen), respectively.

Like in agriculture, seafood products are primarily used for self-consumption and donations (60% self-consumed, 19% donated in 2010) and 21% are sold. In 2010, fishing generated XFP 644 million in revenues for tribal populations. Households in the northern, western and southeastern tribes (Yaté, Thio and Isle of Pines) tend to sell their fish much more than those in the rest of the country. That same year, in addition to fisheries "mainly for subsistence", 656 tons of fish from the lagoon (538 tons in 2015), 2,860 tons of tuna and tuna-like species (2,840 tons in 2015) and 253 tons of sea cucumbers and trochus (192 tons in 2015) were officially taken from the New Caledonian reefs by professional fishers (as declared in the fishing logbooks filed with the provincial authorities). This resulted in sales of XFP 555 million in 2010 (XFP 447 million in 2015) for seafood products coming exclusively from the lagoon and XFP 1,300 million for longline fishery products (XFP 1,200 million in 2015).

"The lagoon is our larder"

*«It's not just about nickel in this country... we cannot eat earth.»
(Koumac)*

"There is no other choice but to value fishing or tourism, if we don't do it, soon there will be no one left in the islands, they will all leave. This is a way to keep people at home."

²¹ Survey conducted by the IAC among 1,786 households, or about 12.5% of tribal inhabitants (GUYARD *et al.*, 2013).



Loading of a milkfish or *mikwaa* (*Chanos chanos*) net on a decked pirogue in Pwadèwia, St. Joseph Bay, Isle of Pines, 2017. © M. Juncker



Circled by a net and then caught by strong fishers, the milkfish or *mikwaa* (*Chanos chanos*) are brought back on board a pirogue, Isle of Pines, 2017. © B. Juncker

Fishing trips ("coups de pêche" in French), are valued by all New Caledonians who are attracted to the sea, as a way of feeding the family, contributing to ceremonies, earning a little money or even earning a larger income. We must remember that, above all, the lagoon is described as a "larder" by many women and men who live by the lagoon, near the reef flats. This term symbolizes both the food, economic and symbolic values attached to the reef and those who experience, know and want to care for it. It shows that, for many reasons, coral reefs are an essential natural and cultural heritage for New Caledonians.

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Bay of Upi, Isle of Pines. © P.-A. Pantz

Coral biodiversity of Larégnère reef. © IRD/S. Andréfouët

Cover page 4 (from left to right):

Loading of a mikwaa net on a decked pirogue at Pwadèwia, St. Joseph Bay, Isle of Pines, 2017. © M. Juncker

Clown fish eggs. © G. Boussarie

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