

FISHLIFE



Part 4 in a series about inshore fish of Hawaii. The 12-part series is a project of the **Hawaii Fisheries Local Action Strategy**.



WHY THERE ARE SO MANY NATIVE HAWAIIAN NAMES FOR MOI

BY SCOTT RADWAY

IN THE MID-'90S, FLUSH WITH FEDERAL FUNDING, OCEANIC INSTITUTE BEGAN RELEASING THOUSANDS OF MOI OFF OAHU.

"We released upwards of a million fingerlings during the course of the stock enhancement," says Alan Friedlander, a lead researcher at the institute.

The idea was to bolster moi stocks, which had dropped precipitously since the end of World War II. Traditionally, moi, or Pacific threadfin, was never thought to be abundant and only Native Hawaiian chiefs were allowed to eat it. But after World War II, with the fishery open to all, the tasty fish was fished heavily. Numbers and sizes declined rapidly.

Meanwhile, scientists had in the early 1990s successfully began breeding the fish in captivity. The great hope was by releasing tens of thousands of farmed fish over several years, the populations would rebound.

It didn't work.

Friedlander says on the bright side, tagging showed that upwards of 10 percent of the recreational catch on Windward Oahu in the late '90s was farmed moi. But the problem was moi's biology. Moi are sex changers, meaning they first become males after their juvenile stage, then pass through a hermaphrodite stage (where male reproductive organs turn into female) and finally become females as they get large.

So the juvenile fish they released, in addition to natural predation, were likely being fished out long before they could reach the female stage and really benefit future spawning.

"Stock enhancement is not a panacea for overfishing. It has to be done in conjunction with an overall management strategy, because you are not getting at the root problem, which is intensive overfishing, particularly of large reproductive females," Friedlander says.

Native Hawaiians of old knew the importance of the life stages of moi. That's why they had four names for moi. "Native Hawaiians long recognized that they change sex



Moi, or Pacific threadfin, is known for its whisker-like extensions that help it find food. Below is a moi harvest at Paepae o He'eia, He'eia Fishpond in Kaneohe.

Photo: Bruce Mundy

and they have specific names for each life history phase," Friedlander says. There are moi-li'i, the juveniles; moi mana, the males; pala moi, the hermaphrodites; and moi, the big females.

Part of traditional management practices was avoiding disturbing nursery grounds for the juveniles, avoiding fishing spawning sites and preserving big females to ensure successful breeding. Practices which are being revived in places such as Molokai.

"In the past, they recognized these critical life history stages, times and locations of spawning, and

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Photo: Lisa Asato/Office of Hawaiian Affairs

Moi, or Pacific Threadfin, is the only species of threadfin found in Hawaiian waters. In traditional times, the delicious food fish was only eaten by Hawaiian chiefs.

- ◆ Moi typically grow up to 18 inches, with maximum recorded size of 24 inches. Maximum known weight is 7 pounds.
- ◆ Moi change sex as they age, from male to female. They become sexually reproductive males at 10 inches, fork length. Females, at 16 inches.
- ◆ Spawning starts May through June and runs through October. Moi fishing is closed June through August.
- ◆ Moi have pectoral fins that are separated, long and slender and used to search for food along the ocean bottom.

Source: Division of Aquatic Resources

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If moi change sex from male to female as they get older, what happens if we fish only the big ones?

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they tried to harvest in harmony to allow for replenishment," Friedlander says.

One person who sees the moi's short-circuited spawning cycle clearer than most is Hi'ilei Kawelo, executive director, of Paepae o He'eia, He'eia Fishpond in Kaneohe. Kawelo says they grow moi at the traditional Hawaiian fishpond but are dependent on Oceanic Institute for fingerlings.

"The way they were stocked traditionally was using wild stocks, and those wild fish were creating fingerlings, which would naturally recruit into fish ponds," Kawelo says. Native Hawaiians managed the fishery to ensure that recruitment.

"We have a lot to learn (about fishery management) from our kupuna."

The federal funding for the Oceanic Institute moi stock enhancement project has long since run out. But the state today has smaller scale program run through Anuenue Research Center. The project, started in 1999, has released 50,000 cultured fish in Oahu waters. But Thomas Iwai, Jr., project coordinator, says the state is sometimes criticized for releasing too few fish.

However, Iwai says, the program intentionally releases a conservative number in order not to displace the wild gene pool. Iwai says if cultured fish become dominant it could lead to genetic inbreeding and result in birth defects and less disease resistant fish.

At the same time, the state is studying the behavior and life stages of the fish to determine when moi migrate offshore and breed, and how old and big the fish is when it becomes sexually reproductive. So in addition to the stock enhancement the state restricts fishing for moi from June 1 through August 31, its peak spawning time.

In recent years, it was also determined that the fish typically becomes reproductive at 2 years and at 11-inches, measuring from the head to tail fork. As a result, the minimum size was raised from 7 inches to 11 inches in 2003. With gene testing, Anuenue Research Center is also determining whether cultured fish are breeding with wild moi and whether their offspring are entering into the fisheries.

At the same time, private companies are now farming moi for sale from fingerlings provided by such organizations as Oceanic Institute, Iwai says. That will hopefully reduce the fishing pressure on the fishery. It also reduces the cost of the very tasty fish.

"In the 1990s, moi cost \$14 to \$16 a pound," Iwai says. "Now, it's \$6.50 a pound."



Photo: Alan Friedlander

A fisherman prepares to throw net for moi. Adult moi prefer rough, rocky coastal waters pictured here. The areas are sometimes referred to as moi holes.

RUNNING MOI



Moi was the fish of kings. Only the alii, or Hawaiian chiefs, were permitted to eat it and woe was on the commoner who broke that kapu and ate one. Margaret Titcomb in her book, "Native Use of Fish in Hawaii," notes that Oahu was noted for moi among the islands and Kaena Point and Mokapu were good spots to fish for them, though the fish was not common in traditional times.

There are some tales of men whose job it was to run live moi fished or taken from a fishpond to a chief. One noteworthy tale is about a man who had to run from Kona to his chief in Hilo before the fish died. Titcomb says if a large school of moi was seen, it was taken as omen of disaster to the chiefs.

Of particular note is that Native Hawaiians had four different names for moi, describing each life stage of the fish and demonstrating how keenly they observed the fish and managed it.



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