FISH LIFE

Part 6 in a series about inshore fish of Hawaii. The 12-part series is a project of the **Hawaii Fisheries Local Action Strategy**.

AS FISHING INCREASES, YELLOW TANGS FLOURISH. WHAT GIVES?

BY SCOTT RADWAY

Photo: Bill Walsh/DAR

THIS IS EXACTLY HOW MANAGEMENT IS SUPPOSED TO WORK. In 2000, the state started aggressively managing yellow tang, the prize fish of the aquarium trade in Hawaii. It was a move that came on the heels of community concern that the fish were being overharvested.

Since, the yellow tang population along Kona coast – the heart of the aquarium trade in Hawaii – has increased an impressive 35 percent. But at the same time, the number of yellow tangs collected for the aquarium trade jumped 81 percent. The value of the yellow tang catch overall increased 164 percent, leaping from $383,000 to more than $1 million per year.

So there were more fish in the water, fishermen caught more and made more money.

"This has the potential to be a success story that people can apply in other parts of the world. A case study of how you go about management," says Jeremy Claisse, of the University of Hawaii.

"This will get a lot of press around the world."

But how did it happen? For starters, people like Claisse really got to know the fish. When managing a fish, some of the critical things to know are how long the fish lives, when it spawns, its age when it starts spawning and where it lives and feeds. With that information, managers can better ensure the fish can replenish its population year after year.

Here's some key facts Claisse found through years of research.

Yellow tangs – a fish a little bigger than a silver-dollar pancake – live for decades. Claisse says one yellow tang studied was 41 years old and it is common to find 20- and 30-something yellow tangs. The fish grows very fast its first few years, but then slows to an almost zero growth rate.

When it comes to spawning, yellow tangs produce on average about 1 million eggs a year. That number of eggs, Claisse says, is low compared to other reef fish, such as snappers or groupers. And the larvae of yellow tang drift out to sea where they spend two months before returning to the reef. Conditions in the open ocean are rough and Claisse says likely less than one percent survive. That's why yellow tang tend to spawn year round and for decades to increase their chances of survival.

Another key behavior of yellow tang that scientists found is yellow tang tend to stay in one location for years. Claisse says juveniles hardly move at all when they arrive on the reef, hunkering down in heavy coral gardens with plenty of places to hide. As adults, the fish move to shallow reef flats where they can find algae to **CONT. >>**

One of the biggest challenges in managing a fish is knowing its life history. However, Yellow tang is among the most understood fish in Hawaii.

- Yellow tangs live for decades (the oldest known is 41 years old)
- Yellow tang grow quickly in its first years, but then slow to an almost zero growth rate
- Yellow tangs become sexually reproductive between 4 and 7 years old
- Juvenile yellow tangs prefer to live in coral gardens with plenty of places to hide. Adults prefer shallow reef flats where algae they feed on is more abundant
- Yellow tangs produce on average 1 million eggs a year, which is low compared to such reef fish as snappers or groupers
- Yellow tang eggs spend two months in the open ocean as larval fish; less than one percent likely make it back to the reef
- Yellow tang's spawning strategy is to spread out their reproductive effort over the course of each year and over the two to three decades of their reproductive lifespan

Source: Jeremy Claisse

FISHLIFE

Why is yellow tang thriving when people are fishing for it more and taking more of them?

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eat, but remain in the same areas, day after day.

Claisse says all those characteristics make the yellow tang a perfect candidate for marine protected areas. Because the spawning success is so variable, a sustained healthy adult population is critical. Then considering the fish tends to stay in one area and lives for decades, it is easy to protect a spawning population.

That's largely why in 2000 the state – with key backing from the community group, the West Hawaii Fisheries Council – designated a series of fishery replenishment areas on the West Hawaii coast that banned aquarium fish collecting. The network of areas cover 35 percent of the shoreline. And 8 years later, the results of course are impressive.

More fish, more fisherman, more money being made.

Says Bill Walsh, of the state Division of Aquatic Resources in Kona, "It's like a return on your investment in year one that will be paying back for decades."

So are yellow tangs in the free and clear? Not entirely. Walsh says as the numbers break down, the protected areas have seen a 95 percent increase in yellow tang. And demonstrating the bounty of the protected areas, there are bumps in numbers just outside the protected areas, demonstrating spillover from the healthy population.

But in open areas, the yellow tang has actually decreased by 5 percent. Walsh says the state might have to consider limiting the number of permitted aquarium fishermen, which has ballooned in recent years as the fishery flourished in the protected areas. And while the yellow tang population is strong, it is not clear how other aquarium targeted species are faring. Walsh says the discussions are underway to create a list of species that can be sustainably harvested.

Walsh adds this past year, for the first time, the number of yellow tang collected actually decreased. That is most likely due to a down year in spawning. For the same reasons yellow tangs spawn so much and for so long – because success is naturally variable – the year's spawning success could be down.

So management might need to be further refined.

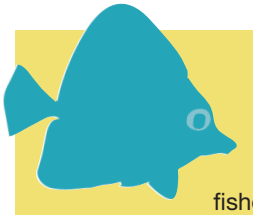
"But the good news is the breeding population is very robust," Walsh says.

And sustainable.

A fisherman collects yellow tangs for the aquarium trade. The price paid to the fisherman for a single yellow tang increased 46 percent, from $1.97 to $2.87 since 2000.

Aquarium trade collectors target juvenile yellow tangs because they are better suited for fish tanks. Juveniles are typically found in coral gardens, where there are plenty of places to hide.

Photos: Bill Walsh/DAR



MONEY FISH

The aquarium trade is the most economically valuable reef fishery in the Main Hawaiian Islands, with landing revenues exceeding akule, opelu, lobsters, reef fishes and even bottomfish. Almost 200 commercial fishers presently hold valid aquarium permits and the reported revenues reached $1.6 million in fiscal 2007.

The yellow tang is far and away the most important species in the aquarium fishery comprising 73 percent of the total fish catch and 67 percent of the total value, or nearly $1 million. Of that haul, more than 90 percent of the statewide yellow tang catch comes from the Big Island and almost all of that from West coast of the Big Island.

That equates to 354,000 Big Island yellow tang caught last year.

Source: DAR

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