

Business

Science & Innovation



Sea & Reef, run by Soren Hansen (at top), is one of only a few marine labs whose tropical saltwater fish are grown from eggs produced in captivity, including the Maine Blizzard clown fish (far left), sea horses, Darwin Ocellaris clown fish (above), and neon dottybacks (below).



PHOTOS BY SOREN HANSEN

Breeding Nemo, Maine lab flourishes

Where others failed, grad student finds key to raising saltwater tropical fish

By Kelli Whitlock Burton
GLOBE CORRESPONDENT

Soren Hansen's first marine lab was in the closet of an apartment in Orono, Maine. The University of Maine graduate student wanted to breed saltwater tropical fish in captivity and shared his idea with a few skeptical faculty scientists.

If tropical fish could be grown in Maine, he was told, it would have already been done. His closet was the only lab space he could get.

That changed, however, after he successfully bred more than 400 tomato clown fish in his homemade aquarium, feeding them with zooplankton grown in another closet. What began eight years ago as an unlikely experiment has earned Hansen the respect of those naysayers, and spawned a successful company that sells captive-bred tropical saltwater fish to pet stores around the country.

The ornamental fish industry is a billion-dollar enterprise in the United States, but the sale of saltwater aquarium fish has historically made up only a small part of that trade. Saltwater aquariums were more expensive to stock and harder to maintain, which discouraged many fish enthusiasts from buying the brightly colored swimmers.

That trend began to change earlier this decade, thanks in part to a decrease in cost and a feisty clown fish named Nemo. Disney's animated hit, "Finding Nemo," did for the tropical fish industry what "101 Dalmatians" did for breeders of polka-dotted canines. Consumer demand went through the roof.

Hansen's company, Sea & Reef, is one of only a few whose tropical saltwater fish are grown from eggs produced in captivity. Most companies stock only fish caught in the wild, many of which are captured with chemicals and methods that damage the fish, other sea life, and the delicate reef ecosystems where the fish live. Hansen says in some nations, fishermen use chemicals such as sodium cyanide to stun fish, making

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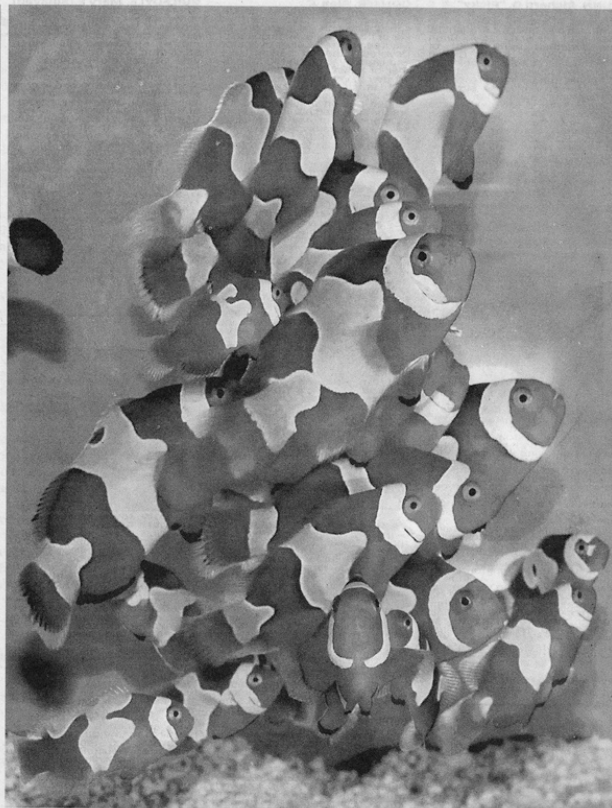
them easier to net.

Fish collected from the wild may spend days to weeks in large holding tanks before they are shipped to tropical fish suppliers worldwide and then on to pet stores. The fish are susceptible to a number of diseases, which may be easily spread while the animals await shipment.

Vance Peters, owner of Vance's Tropical Fish in Bucksport, Maine, was among Hansen's earliest customers. In more than 20 years in the business, Peters says, he was often disappointed with the fish caught in the wild that he got from other companies.

"Whenever we'd bring in wild clown fish, many of them would get sick, and no matter what we did, they would die," Peters said. "But we've never lost a single fish that came from Soren's company."

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PHOTOS BY SOREN HANSEN

Picasso clown fish, which originate in the Pacific Ocean, are among the tropical fish that Sea & Reef is breeding in Maine for sale to pet stores around the country.

Perseverance is paying off for Maine fish-breeding lab

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An avid aquarist who bought his first saltwater aquarium more than a decade ago, Hansen was familiar with the downside of stocking marine fish caught in the wild. It's little wonder that soon after arriving in Maine in 2000 for graduate school, the Denmark native hatched a plan to create a tropical marine fishery, along with Chad Callen, a fellow student. With the skeptics' warnings that tropical fish could not be bred in chilly Maine still ringing in their ears, the pair originally planned to base their company in Hawaii. University of Maine marine biologist David Townsend changed their minds.

"He believed in the project — when most were shaking their heads — and provided us with the funds for the small-scale hatchery," Hansen said. So Hansen moved his tomato clown fish breeding pair — Moe and Louise — from his closet to a small lab on campus and began the complicated process of raising ornamental saltwater fish on a large scale.

Coming up with the right tank design, water flow, and temperature, and developing the animals' food source are just a few of the challenges to raising captive-bred swimmers. Tropical marine fish can lay anywhere from 400 to 3,500 eggs at a time, and some species lay eggs daily. Some larvae are able to eat as soon as they hatch; others are less developed and unable to eat at first. All the larvae need live food but the prey must be smaller than the larvae.

"Breeding tropical fish is very different from breeding cold-water fish, and many just don't want to go to the trouble," Hansen said, especially when wild fish are abundant.

What others saw as "trouble," Hansen and Callen embraced as a scientific endeavor. Few studies of tropical marine fish develop-



In its first year, Sea & Reef sold 407 fish bred in its marine lab in Maine. This year, that number has jumped to 14,000.

ment have looked closely at the earliest stages of the animals' lives, said Hansen, who tracks fish from fertilization to larvae to adult swimmers.

Tropical marine fish are either demersal spawners — laying eggs on the sea bed — or pelagic spawners — releasing eggs into the water column. Although the majority are pelagic, including the popular yellow tangs and angelfish, these also are the hardest species to breed in captivity. The larval stage is longer than in other fish and when they hatch, they are tiny, underdeveloped, and unable to eat live food for several days. Demersal larvae, on the other hand, are harder and able to eat at birth.

All 14 species Hansen has bred are demersal spawners. So far, no one has raised pelagic tropical fish on a large scale. With support from a US Department of Agriculture grant, Hansen is developing a new type of captive-bred live prey to feed a species of angelfish. Much of the details are a trade secret, but Hansen said the prey is found in the ocean and reproduces faster than food sources developed by others working with pelagic spawners. He has also done studies on angelfish larval development and believes that within

one to two years, he will have developed his first generation of pelagic spawners.

Maintaining and stocking a saltwater aquarium is an expensive hobby, but despite the economic downturn, business is thriving. In its first year, Sea & Reef sold 407 fish. This year, that number has jumped to 14,000.

Hansen bought out Callen's share of the business several years ago and has utilized every inch of the space the university gave him. Earlier this year, he received a \$200,000 grant from the Maine Technology Institute to support expansion of his lab and research efforts. He's using the money to build a new facility at the university's Center for Cooperative Aquaculture Research, a small-business incubator located in Franklin, Maine.

At 12,000 square feet, the new facility is four times larger than his current lab. The space will allow him to expand his research into pelagic spawners, increase the number of demersal species he breeds from 14 to 30, and increase the number of fish he breeds each month from about 1,000 to 16,000.

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