

## ORNAMENTALS

# Ornamentals thriving in Maine

*Launched on a shoestring by two students at the University of Maine, Sea & Reef Aquaculture is now shipping thousands of colourful reef fish to enthusiastic buyers across the country.*

BY MURIEL L. HENDRIX | PHOTOS: SEA & REEF AQUACULTURE

**FRANKLIN, MAINE** – Near the entrance of the 12,000-square-foot building that is home to Sea & Reef Aquaculture, numerous tanks hold thousands of brightly colored tropical fish destined for pet stores and wholesalers across the United States. In some, twins of “Finding Nemo’s” hero, the Tomato Clownfish, swim around each other, each confident in its own space; in others, shyer fish like the Percula Clownfish clump together and hide behind each other. Each tank holds ornamental wonders: Pajama Cardinals, Neon Dottybacks, Picasso Clownfish that have the Nemo colors but with a different pattern on each fish, color morphs of Clownfish created at Sea & Reef by selective breeding and Maine Blizzard Clownfish.

All of the approximately 20 species (including color morphs) have been raised from eggs spawned at Sea & Reef, an achievement that ensures no tropical coral reefs have been harmed or fish species further depleted when these fish reach a hobbyist’s salt water tank.

## SUSTAINABLE MOTIVES

For Søren Hansen and Chad Callan, who started the company together while students at the University of Maine at Orono, sustainability was a major reason they moved from research with cod to focus on ornamental tropical fish. Hansen, now the sole owner since Callan

moved to Hawaii, explains that millions of tropical fish imported each year to fill hobbyists’ reef tanks are harvested with harmful methods such as using sodium cyanide or dynamite to stun the fish. As many as 80% of the fish die during collection, in transport or while being held for sale. Sea & Reef and companies like it can help ease the stress on these species and coral reefs. Eventually, Hansen wants to culture every marine animal that a hobbyist needs to stock a reef tank, including corals, anemones, ornamental shrimp and sea horses.

By next September, Hansen plans to be selling 16,000 tropical fish a month, a giant leap from the 1,000 a month he and Callan were selling from the Aquaculture Research Center in Orono. This growth has been made possible by multiple sources of support, including grants from Maine Aquaculture Innovation Center, Maine Technology Institute, Efficiency Maine and the U.S. Department of Agriculture.

The venture began 10 years ago when Hansen, then finishing up his masters degree, started a side project in aquariums located in his apartment closet: he raised and sold the progeny of a breeding pair of Clownfish dubbed Moe and Louise. Callan had already graduated and was working in Hawaii. Together they formed a plan to begin a tropical fish hatchery in Hawaii.



Søren Hansen views colourful clownfish through back of aquarium at Sea & Reef Aquaculture.

## HELP & ENCOURAGEMENT

David Townsend, who was Director of the School of Marine Sciences, heard about their plans to raise tropical fish in Hawaii and encouraged them instead to start the business in Maine while earning PhDs. With help from Jake Ward, the university Assistant Vice President for Research, Economic Development and Governmental Relations, they formed Sea & Reef Aquaculture in 2003 and moved their small business to the campus Aquaculture Research Center.

Townsend says he was impressed by the promise and sustainability of raising the tropical fish in Maine, although other faculty members were skeptical, considering the Maine climate. “Actually, Maine’s cold water is a positive factor,” he says, noting that “If any tropical fish escape from a Maine facility, they would not survive. They pose no threat as an invasive species, which is a big problem with tropical fish raised in warmer climates.”

Townsend added that the presence of tropical fish in the aquaculture center was beneficial because unlike cod, which spawn once a year, the tropical species produce thousands of eggs year round. The project provided a constant source of research opportunities and aquaculture training for other students.

Sea & Reef thrived in Orono, but Hansen needed to expand. In 2010, when Seabait, a company doing research and development in the culture of sand worms at the University’s Center for Cooperative Aquaculture Research (CCAR) in Franklin moved out, CCAR director, Nick Brown, called Hansen and asked if he was interested in moving there.

## VITAL GRANTS

Brown secured a \$360,000 MTAF bond fund grant to turn the Seabait facility, which was corroded from moisture, not insulated and had a dirt floor, into an energy efficient building. R35 insulation was installed



Neon dottybacks.



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in the walls and ceiling and a concrete floor was poured. With a \$200,000 MTI Development grant (which he will repay), Hansen funded production systems, including a water supply system with heat exchangers, high tech filtration, and UV sterilization, and a 13-foot-tall water tank insulated with a covering of six-inch foam that looks like a monster paper mache project. Installation of the infrastructure at the new facility was completed by Hansen and his hatchery manager Brandon Weik. Meanwhile, another Sea & Reef full time employee, Jonathan Labrecque, who had been working with them at Orono while completing an undergraduate degree in marine science, took care of the operation there.

During a February 2011 snowstorm, they transported fish in styrofoam boxes with heat packs to keep the water temperature up. Their temporary layout was ready: Clownfish broodstock could swim in tanks where flower pots serve as surrogate anemones (in the wild they have a symbiotic relationship with anemones), cylindrical tanks held algae to feed zooplankton which provide nutrients for fish larvae, and tanks were in place for larvae and growout.

Presently, Hansen is shipping around 1500-2000 fish a month, which he says will increase to 3,000 to 4,000 fish a month in the peak season, January through March. He is adding a web site ([www.seaandreef.com](http://www.seaandreef.com)) and a part-time sales person by January. After conducting a shipping study funded by MAIC, he has developed a shipping protocol for fish densities, water volume and temperature that ensure safe delivery. He notes that his captive-raised fish are more suitable for hobbyist tanks than wild fish: "They've spent their entire life in tanks and are accustomed to people," he says, "and they are free of parasites and diseases. They're healthier."



Demersal and pelagic eggs.



Ocellaris clownfish.



Aerial view of the Center for Cooperative Aquaculture Research in Franklin. Sea & Reef Aquaculture is leasing the white building to far right from the University.

(Photo courtesy University of Maine).

### AFTER THE MOVE

After the logistics of moving and further expanding production systems is completed, Hansen will begin to raise ornamental shrimp and sea horses and return to his research with multiple pairs of beautiful Flame Angelfish (*Centropyge loricula*). They are pelagic spawners, meaning they lay their eggs in the water column, rather than on substrate like the Clownfish and other species Hansen has been raising, which are known as demersal spawners. He has completed the first stage of successfully rearing pelagic larvae, a tricky process because pelagic fish eggs produce larvae that have such small mouths they are not able to consume the zooplankton normally fed to larvae at the earliest stage of growth. Hansen was able to discover and grow suitable feed to raise the pelagic larvae to the size where they could consume conventional feed. Because pelagics account for 90% of tropical species, developing a methodology to raise them will open the way for the culture of many additional species.

When Hansen came to Maine from Denmark to work on his MS in Marine Biology, he says he envisioned some day working outdoors in the field, not in a cavernous building with no windows. But, nearly all his life he has been fascinated by aquariums, both freshwater and marine, and being indoors much of the time is his trade off for pursuing this interest, and at the same time reducing stress on coral reefs and their popular inhabitants.

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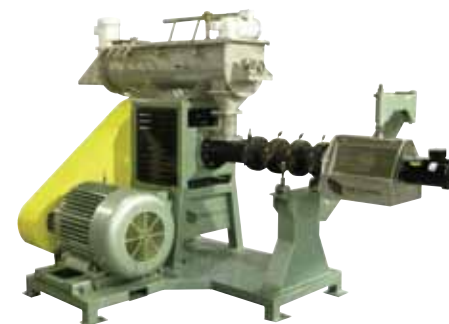
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