Rising Tide Conservation – History and Successes

A conservation cooperative spearheaded by SeaWorld Parks & Entertainment is helping to make aquaculture of marine aquarium fish a real and viable alternative to wild collection. Rising Tide Conservation is a collaborative effort to advance technical ability and disseminate information regarding marine aquaculture.

Nearly all marine aquarium fish – about 98% – are harvested from the wild because reliable protocols for the aquaculture of marine fish have not been developed and shared throughout the industry. North American public aquariums have already bred more than 100 marine fish species, but the majority of these have been opportunistic and sporadic occurrences. These breeding successes, therefore, have not had long-term impact on marine fish collection. The vast majority of marine fish collecting is to supply the hobby industry where, despite reported captive breeding efforts, commercially bred marine tropical fish remain in the minority.

Large scale tropical marine fish aquaculture has been held back by four specific hurdles: difficulty in egg production, difficulty in larval rearing, use and production of an appropriate live feed, and most importantly, the difficulty in clearing these hurdles in an economically viable manner.

In 2009, SeaWorld Parks and Entertainment initiated a program dedicated to breeding and rearing marine tropical fish in economically viable ways to provide alternatives to wild collection. Led by SeaWorld's Vice President of Research and Science, Dr. Judy St. Leger, Rising Tide Conservation integrates the efforts and expertise available at universities, private industry, public aquariums, the marine aquarium hobby, and other research institutions to build on successes and exchange information.

Rising Tide Conservation has had many breeding and rearing successes in its seven years of collaboration including porkfish, dragonets, grunt, angelfish, and gobies. Most notably and recently, Rising Tide Conservation partner the Oceanic Institute in Hawaii has gained international recognition with one of the world's most popular saltwater aquarium fish, the yellow tang (*Zebrasoma flavescens*). More than 300,000 of these fish are collected from Hawaii's reefs each year and they now represent a breakthrough in marine aquaculture nearly 15 years in the making.

In 2001, the Oceanic Institute in Hawaii began its focus on breeding and rearing yellow tang in the hopes of establishing protocols to raise this iconic species in an aquaculture setting. The task was challenging; the larvae of this species are microscopic and they eat sub-microscopic copepods and algae. Almost nothing is known about the larval stages of

these and most other small reef fish. They have a complex lifestyle; 1000s of eggs are deposited in the reef and the emerging larvae then drift with currents, eating along the way, for one to three months until they develop a tail and the ability to swim with purpose. For more than 10 years, the Oceanic Institute focused on developing the fundamental of rearing yellow tang. Their efforts struggled at a "bottleneck" in the process at day 19 of development.

Funding from Rising Tide Conservation gave the Oceanic Institute the resources it needed to move the yellow tang project forward. In just one year, researchers worked passed the bottleneck they had experienced for a decade. In October 2015, a group of yellow tang survived to juvenile stage and in March 2016 the process had become reliably repeatable and commercial shipments of fish were made to wholesalers and aquariums.

As a founding partner of Rising Tide Conservation, SeaWorld Orlando was one of only a handful of organizations given the opportunity to purchase part of the *first* commercial shipment of aquacultured yellow tang. About 200 of these fish may now be viewed by guests in the new Rising Tide Conservation aquarium at SeaWorld Orlando's Shark Encounter exhibit.

Rising Tide Conservation will continue to support breakthrough marine aquaculture efforts and SeaWorld is working behind the scenes providing funding for research; fish, larvae, and eggs for aquaculture labs; expertise based on decades of success in fish breeding and rearing; and ensuring that both successes and roadblocks are shared among all the groups participating in Rising Tide Conservation.

Learn more about Rising Tide Conservation at SeaWorldCares.com/RisingTide, or check out one of our recent blog posts on SeaWorldCares.com:

Happening Now: Tropical Fish Are In Danger

World's First Commercial Shipment of Aquacultured Yellow Tang Debuts at SeaWorld Orlando!

From Coral Reefs to Aquariums: Protecting Tropical Fish

Saving The Reefs One Fish At A Time

One Small Fry For Rising Tide, One Giant Leap For Marine Aquaculture

Real. Amazing. Rising Tide Conservation