HSWRI Aquaculture Program Research Report
**** October - November 2014 ****

Rose Canyon Fisheries Paves the Way for Sustainable Ocean Farming off San Diego

HSWRI has formed a business relationship with Cuna del Mar (CdM), a private equity fund dedicated to developing sustainable aquaculture, to incorporate Rose Canyon Fisheries, Inc. (RCF). RCF will permit, establish and operate a commercial-scale fish farm off the coast of San Diego, CA. This will be the first finfish farming operation in U.S. federal waters. The RCF collaboration is dedicated to fulfilling a major void in our Nation's seafood industry – a reliable, sustainable, domestic source of healthy, premium fish, grown with care in a clean, natural and regulated environment.

Figure 1. White seabass schooling in a cage system at Catalina Island.

This project is being driven by the growing global demand for healthful seafood and a lack of domestic production. Traditional harvest fisheries cannot meet this increasing demand. The U.S. farms only 2.5% of its total seafood and catches only 6.5% leaving 91% of our supply to be imported thereby contributing over $11 billion to our annual trade deficit. Approximately half of the seafood we import comes from aquaculture in foreign countries.

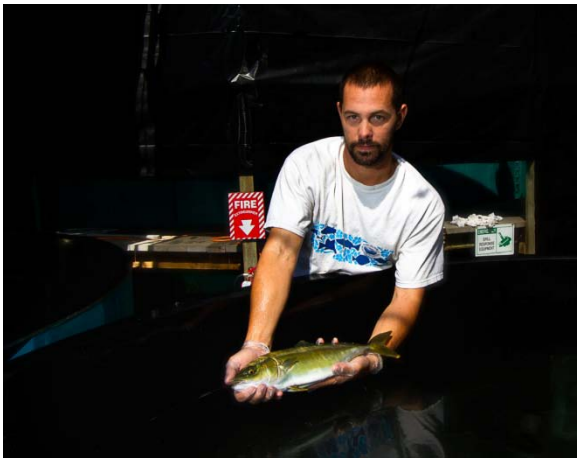

Figure 2. Research Scientist, Kevin Stuart, with a juvenile yellowtail at HSWRI.

The proposed project will eventually produce 5,000 metric tons (MT) of yellowtail jack, white seabass and striped bass annually in sea cages that will be located 4.5 miles (7.2 kilometers) from the San Diego shoreline. These are common species in coastal waters of California.

The proposed location was sited to meet multiple requirements and avoid conflicting uses and protected habitats. The site is in deep, clean, temperate, water with good current flow over a sandy bottom. This farm will support the existing seafood industry by creating new industry jobs and opportunities for commercial fishermen, and it will help ensure that the existing infrastructure for fish processing and distribution has a viable future. The consumer will benefit from a year-round supply of high quality seafood that is safe and healthful. The wild fisheries will benefit as a supplemental supply of high quality farmed fish will take pressure off wild fisheries.

US-Japan Natural Resources (UJNR) Aquaculture Panel Meets in San Diego

The National Oceanic and Atmospheric Administration (NOAA) and the Japanese National Research Institute of Aquaculture have been working together since 1971 to enhance the development of freshwater and marine aquaculture. Each year Japanese and U.S. scientists attend the aquaculture panel meeting to present and discuss current research on a specific aspect of aquaculture. In addition, a number of scientists visit their colleagues' laboratories to advance research and share resources. This fall, the 42nd annual scientific symposium of UJNR was held at the new Southwest Fisheries Science Center (SWFSC) in La Jolla. Participants were treated to tours of the facility and ocean views from the conference room. The theme of the symposium was "Genetics in Aquaculture".

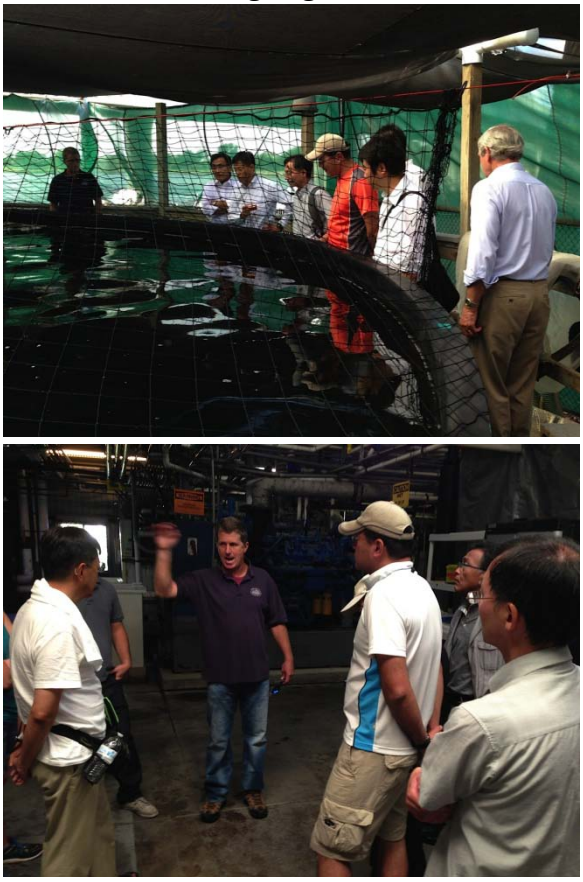

Figure 3. UJNR participants tour HSWRI facilities in San Diego (top) and Carlsbad (bottom).

HSWRI has taken an active role in the UJNR meetings, especially in recent years. The opportunities for collaboration are readily apparent given HSWRI's emphasis on culturing flounder and yellowtail, which are two of Japan's top species as well. This year we participated as a member of the organizing committee with others from NOAA, California Sea Grant, and USDA. The program also offered tours of HSWRI's hatchery facilities in San Diego and Carlsbad. Among the presentations at the symposium, talks on *Seriola spp.* dominated, owing largely to recent

expanded collaborations between HSWRI and the SWFSC on yellowtail genetics and physiology. This work has subsequently expanded to other research centers around the country.

The UJNR meeting returns to Japan next year.

HSWRI Researchers Capitalize on Abundant Seabass

Two year old white seabass of 12-20" were relatively abundant in coastal waters this fall and HSWRI researchers made time to capitalize on it for the seabass breeding program. Special permits allowed the team to legally catch these fish, which otherwise have a 28" minimum size limit and catch limits of 1-3 fish depending on the time of year. Fishing mainly in the protected waters of Mission Bay and Oceanside Harbor allowed the team to utilize small skiffs or even docks as fishing platforms. Not surprisingly, the best time for fishing was the first few hours after dusk. Because seabass is a schooling fish, multiple fish were typically caught when the school came through. A night light was used to attract baitfish, which in turn brought in the seabass, increasing our odds significantly. Several nights brought in double digit numbers of seabass that were subsequently transported to the Carlsbad Hatchery. This method of broodstock collecting is highly efficient compared to the effort required to collect significant numbers of adult fish. The downside is that the fish will have to be held in isolation for another 1-2 years before they can be added to the main breeding pools. We have established a 24" minimum size limit for fish in the primary breeding pools because that is approximately when they are sexually mature and also that is a size where they can generally fend for themselves among fish that may weigh 20-40lbs.

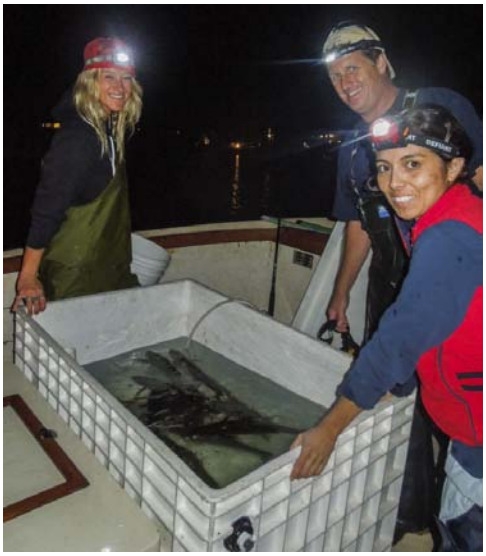

Figure 4. HSWRI researchers showcase their catch of young seabass destined for the breeding program.

Acknowledgements

This document reports on aquaculture research projects supported by numerous grants, contracts and private contributions. It also represents the hard work of many dedicated staff and volunteers throughout southern California, as well as collaborators around the country. This information was contributed by HSWRI staff and compiled by Senior Research Scientist and HSWRI Aquaculture Program Director Mark Drawbridge.

The aquaculture research program has been active for more than 35 years at HSWRI. The primary objective of this program is to evaluate the feasibility of culturing marine organisms to replenish ocean resources through stocking, and to supply consumers with a direct source of high quality seafood through aquatic farming. Please direct any questions to Mark Drawbridge at mdrawbridge@hswri.org.

Aquaculture research at HSWRI is currently supported by these major contributors:

- Avalon Tuna Club Foundation
- Cabrillo Power/NRG
- California Sea Grant
- Chevron Corporation
- Der Fruchtbaum Family Trust
- Fisherman's Landing
- H & M Landing
- NOAA's Saltonstall-Kennedy Program
- Point Loma Sportfishing
- Poseidon Water
- San Diego County Fish and Wildlife Advisory Commission
- Santa Monica Seafood
- SDG&E Environmental Champions
- Seaforth Sportfishing
- SeaWorld Parks and Entertainment
- SeaWorld San Diego
- Soy Aquaculture Alliance
- The California Department of Fish and Wildlife's Ocean Resources Enhancement and Hatchery Program
- The Catalina Seabass Fund
- The Fletcher Foundation
- The Shedd Family
- The U.S. Fish and Wildlife Service's Sport Fish Restoration Account
- United Soybean Board
- USDA National Institute of Food and Agriculture
- Western Regional Aquaculture Center (WRAC)

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