HSWRI Aquaculture Program Research Report
**** April - May 2015 ****

White Seabass Enhancement Program Undergoes Independent External Science Review

After two decades of operation and the release of over 2 million tagged white seabass fingerlings, California's Ocean Resources Enhancement and Hatchery Program (OREHP) is set to undergo a multi-year external review to help guide its future. While progress has always been tracked and reported semi-annually to an Advisory Panel, this review will be conducted by an external Science Advisory Panel (SAC). The independent review process is outlined briefly in the White Seabass Enhancement Plan, which was approved by the CA Fish and Wildlife Commission in 2010, so it has been in the works for quite some time. SAC members are spread throughout the country and represent a broad range of expertise in relevant disciplines including population biology, genetics, fish health, aquaculture, fish biology, etc. The process is being coordinated by California Sea Grant under contract with the California Department of Fish and Wildlife (DFW), who is the lead agency for the OREHP.

Figure 1. SAC members and Sea Grant staff tour HSWRI's white seabass hatchery in Carlsbad, CA.

In late May, the SAC convened at Scripps Institution of Oceanography (SIO) to hear presentations by DFW and HSWRI on the OREHP. The session was coupled with extensive Q&A followed by a tour of the hatchery in Carlsbad. The SAC is currently reviewing reports, publications and other documents associated with the program. Subpanels will be formed to facilitate comprehensive assessments of each core program area, which largely conform to their respective areas of expertise. The primary deliverable from Sea Grant is a comprehensive written report summarizing the SAC's review, including enhancement recommendations for the DFW to consider into the future.

"Dick Laub Fisheries Replenishment Program" Launched

HSWRI's experience culturing a variety of marine fish species has recently coalesced into a formal, multi-year program to complement the long-running white seabass replenishment program. Generous financial contributions from a number of individuals and corporations last year formed the base of a matching campaign that launched the effort. This initial funding was recently doubled by a generous gift from Dorothea Laub, wife of the late Dick Laub, who was an avid fisherman. The financial contributions come at a time when public support is also being bolstered by groups like the Coastal Conservation Association (CCA), which recently expanded into California.

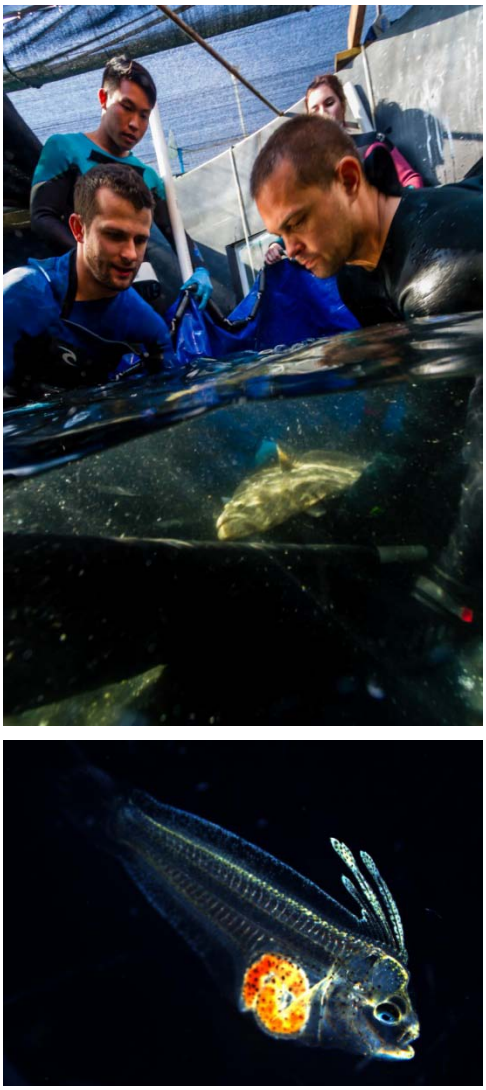

Figure 2. Breeding halibut are given annual health inspection (top); larval halibut at 24 days (below).

In the current phase of this program, HSWRI is working with the DFW to identify candidate species to consider for future stocking efforts. Already some familiar names have been suggested, with California halibut at the top of the list. California halibut was originally identified as the number two species next to white seabass in the early 80's, so a lot of preliminary work has already been done. HSWRI has a spawning population of halibut, which they are currently using to re-assess and refine culture protocols. HSWRI has successfully cultured some of the other species being discussed for possible replenishment, like giant sea bass, kelp bass, sheephead, and cabezon. Once the species list is fully developed and prioritized, appropriate broodstock management plans will have to be developed for the target species in order to facilitate pilot tagging and stocking efforts.

SeaWorld's Rising Tide Conservation Program Takes Root in Southern California

The Rising Tide Conservation (RTC) program is an initiative of the SeaWorld & Busch Gardens Conservation Fund. The mission of program is to protect reefs by developing techniques for rearing marine ornamental fish and promoting commercial production to provide alternatives to reef collection (http://www.risingtideconservation.org/). The

synergies between the RTC program and HSWRI's conservation mission and core competencies are obvious. It was not surprising then when the RTC program Director, Dr. Judy St. Leger, asked HSWRI scientists if they would be interested in partnering in the program with aquarists at the Birch Aquarium at Scripps Institution of Oceanography. The initial target species for a joint culture effort was the scythe butterflyfish (*Prognathodes falcifer*), which coincidentally is the emblematic fish of the Birch Aquarium. As described by the aquarium, "the scythe butterfly is widespread along the Pacific coast and ranges from as far north as Catalina Island off southern California to the Galapagos Islands of Ecuador. It is an unusual species because it prefers coolers waters, while most other types of butterflyfish are warm-water species. In tropical regions it usually dwells between 300 and 500 feet, making it one of the deepest-water species of butterflyfishes".

Figure 3. A scythe butterflyfish at the Birch Aquarium (photo courtesy of Scripps Institution of Oceanography, UCSD)

Working with aquarists from Birch Aquarium, HSWRI was able to obtain several batches of eggs in 2014 and 2015. The eggs were collected from an aquarium containing a single pair of butterflyfish, presumed to be a mating pair. Spawning has coincided with full moons on a fairly regular basis. Unfortunately, the eggs collected thus far have not been viable but efforts will continue. HSWRI is now in the planning stages for a RTC initiative that will involve breeding one or more species of wrasse. HSWRI has already been successful in breeding and rearing a native wrasse, California sheephead (*Semicossyphus pulcher*).

Acknowledgements

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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.

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- The Catalina Seabass Fund
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- The Shedd Family
- The U.S. Fish and Wildlife Service's Sport Fish Restoration Account
- United Soybean Board
- USC Sea Grant
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- Western Regional Aquaculture Center (WRAC)

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