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Photo: Florida Sportsman

Is marine stock enhancement a smart investment?

Karl Wickstrom

No longer is there any doubt that hatchery-reared fish released into coastal waters can produce tremendous benefits both for fish populations and for communities enjoying them.

Successful stocking programs in many parts of the world enhance and maintain populations at sustainable levels, often compensating for weak natural spawns due to weather or many other factors. They also generate millions of dollars in economic activity.

Moreover, a well-run hatchery program can provide additional fish for recreational angling, bringing important socio-economic returns for the public. Sportfishing, as most folks know, is worth billions of dollars.

Yet it is even more significant to consider the positive future effects of stocking on natural standing populations of fish.

Nowhere is this more apparent than in Texas, which has had a superb hatchery program for two decades, mainly producing red drum (redfish) in massive quantities. Authorities there release more than 30 million fingerlings a year into their eight bay systems. Researchers



Photo: Lewis Environmental Services

Roy R. "Robin" Lewis III

First what is "marine stock enhancement?" As applied to fish, it refers to increasing the "stock" or numbers and weights (biomass) in a target population. The biomass of a population is estimated using a stock assessment. For a primarily recreational catch target species this usually involves regular sampling via nets, and creel censuses (what the recreational fisherman catches). For Florida we have concentrated on snook and redfish.

There is currently a fish hatchery on Tampa Bay (Stock Enhancement Research Facility or SERF). It was originally set up to grow snook for the bay. That did not work, so it switched to redfish. The current goal, as described in the Florida Marine Research Institute's Red Drum Work Plan includes "improve catch rates of red drum by recreational fishermen by 25%." This implies stocking enough hatchery-grown redfish that survive to adulthood, and legal harvest size, to allow you to take home more fish. Sounds great! After 36 years of fishing Tampa Bay, I sure would like to take home more fish!

One or two catches here, however. First, marine stock enhancement has been tried before. Dr. Ray Hilborn, professor of recreational fisheries

conclude that at least 25% of the reds in the wild have hatchery origins.

Florida's own program, although much smaller, is showing similar promise. It should be expanded substantially.

Objections to stocking are mostly based on outdated experiences from freshwater programs using old methods.

A commonly heard claim, even now, is that hatchery fish lack genetic diversity. While this was once true in some instances, the fact is that brooders nowadays are refreshed continually. In Port Manatee, for instance, the females are changed for every single group of newcomers.

Another claim is that disease is common in hatcheries and immune systems may be compromised. In truth, diseases are rare and even when found are the same as in the wild. Fish recovered from prior stockings show no pathogenic differences from wild-reared fish.

Still a third negative view reflects the somewhat naive notion that "if nature wanted the fish to be there, they would be there and we shouldn't fool with natural balances."

The no-touch policy may be an appealing concept, especially from a nonfisherman's perspective, but the fact is that we've already "fooled with nature" to a damaging extent in many cases. It now makes perfect sense to compensate for declines caused by overfishing or habitat degradations.

In both Texas and Florida, for example, commercial overfishing after World War II and into the '80s, decimated redfish populations. Netting pressures virtually wiped out the basic stocks.

Bans of gillnets and de-commercialization of reds sparked a comeback, but Texas scientists concluded it would take decades to bring back the populations and foster a strong fishery. Thus, they built three hatcheries that are renowned world-wide for their spectacular successes.

management at the University of Washington in Seattle, has been a keen observer and writer on the subject. After examining 30 years of data on attempts to manage migratory salmon populations in the northwest he concluded "artificial propagation in the Northwest has failed to live up to expectations and in many cases has been an abysmal failure." Second, in a careful examination of 11 marine stock enhancement programs worldwide, including invertebrates and turtles, and the highly touted Texas redfish program, he concluded in a 1998 paper that only one, in Japan, was economically viable. Skepticism is rampant, except, as noted by Hilborn, by "a coalition of (1) users who want more fish, (2) politicians who want easy solutions, and (3) uncritical technology advocates who seek to sell their technology." Ouch!!

In preparation for this response, I contacted the Florida Marine Research Institute, and requested information on the history of stock enhancement in Florida, costs to date and future plans. I received an undated four-page "red drum work plan," a "long-range plan" drafted in 2000 and a list of costs for SERF since 1993. I reviewed these items carefully, and found several fatal flaws, including a total lack of control areas, lack of a clear tie to a bay-wide redfish stock assessment, no indication of an unbiased peer review, and no link to ongoing bay restoration projects. I was not impressed with the scientific underpinnings of the proposed research plan. I hope I will see the results in draft form before the "conclusions" are reached, but I doubt it. Unlike many FMRI programs, the stock enhancement program is noteworthy in that annual reports with all the details are lacking, costs are fuzzy, and scientific results never seem to get published.

I was an early and vocal supporter of the saltwater recreational fishing license.

I was there the day the SERF facility and research program (for snook) was announced at a fancy party at Mote Marine Lab in 1986.

I, like many others, was promised a balanced

Florida later took similar steps in terms of legal protections for redfish but our hatchery effort has lacked the political and financial support that has made Texas reds sparkle.

Researchers say it's no coincidence that Texas has a bag limit (3) that's triple the number in Florida. In fact, the late Texas science director Larry McEachron said there's no doubt in his mind that if Texas didn't have its hatcheries, it would need to have a one-fish limit as in Florida.

None of this is meant to reflect adversely on Florida's Port Manatee program, which is truly outstanding given its constraints and relative shortage of official enthusiasm.

Port Manatee Director Bill Halstead is a highly talented and dedicated staffer who deserves the highest praise, despite my own periodic rantings that Florida tends to re-invent a wheel that Texas successfully designed many years back.

But there is welcome progress as Florida concentrates stockings on Tampa Bay, researching survivability and contemplating what size fish should be stocked to maximize the resultant number of adults per dollar.

Plans are to release 1.35 million youngsters of three different sizes during each of the next two years. Over the past two years, 2.3 million were stocked in lower Tampa Bay.

Many of these fish have assuredly reached the minimum legal keeper size of 18 inches (given a growth rate of one inch per month for the first two years). Still, it is early in the day.

There is every reason to believe that many thousands of these released fish will spawn in a few years and the population growth will be exponential.

At that point, a new Junior will swim away as a product of nature, all right, but his grandparents in many cases will have been products of the hatchery.

portfolio of investments in good scientific experiments, and implementation of the best fishery management has to offer, for the approximately \$150 million in recreational license fees and another \$30 million in Wallop-Breaux matching funds that Florida has garnered in the last 13 years. Increased habitat protection efforts, and more critical fisheries habitat restoration, were also promised. These efforts could benefit hundreds of other species of fish, invertebrates and wildlife in addition to the target species.

What I have gotten to date is a huge investment in artificial reefs (\$1 million/year = \$13 million), stock enhancement experiments (\$1.5 million/year = \$19.5 million), boat ramps, slick brochures and a fancy building (\$?). Although law enforcement is now improving with the new Florida Fish and Wildlife Conservation Commission, the old Florida Marine Patrol never seemed to get it right, and got smaller in the Tampa Bay area, not bigger, after the license fee was implemented.

An equal investment in better direct on-the-ground marine habitat protection and restoration has somehow slipped through the cracks.

Pardon me if I feel like my portfolio is mostly Enron stock, and at least Enron sent out annual reports!

No, I do not think marine stock enhancement efforts in Florida have been a wise investment of public dollars.

Long-time bay advocate Robin Lewis, a professional wetland scientist, is president of Lewis Environmental Services, Inc.

**References: Fisheries. 1992. 17(1):5
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Nature will have taken its course, with a friendly boost from us.

Karl Wickstrom is founder/editor of Florida Sportsman Magazine and a volunteer board member of the Florida Marine Enhancement Board.

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