

Potential Environmental Impacts/Concerns and Benefits for the Gulf Coast Marine Fisheries Hatchery and Enhancement Center proposed for Bruce Beach, Pensacola, Florida

The use of hatcheries to aid in the management of fisheries dates back several decades; the results of this use have been quite mixed. When reading through the peer reviewed literature you find the same thing we have witnessed within community forums here in Pensacola. If you ask one PhD fisheries biologist whether hatcheries should be used as a management tool you will learn about the myriad of concerns which have arisen from past practices. Ask another PhD fisheries biologist and you will learn of the great progress we have made over the past few decades to mitigate the concerns from past practices. There is one thing nearly all (if not all) fisheries biologist would agree on and that is that there are two main limiting factors which have led to the demise of fisheries globally: our insatiable desire to eat fish (overfishing) and a lack of critical habitat for spawning and juvenile fish development. Through research of other facilities and presentations to EAB it was found that Potential Environmental Impacts/Concerns and Benefits for the Gulf Coast Marine Fisheries Hatchery and Enhancement Center proposed for Bruce Beach fell into five categories: land remediation, fisheries, water quality, research and education and other. A summary of those issues follows.

LAND REMEDIATION

A biological survey was performed at the Bruce Beach site in 2013 and it was found that the 10 acre created site is highly disturbed with many invasive species along with other historic debris from previous industrial land uses including creosote-treated timber, concrete pilings, concrete culverts, bricks, abandoned rail spur, and other miscellaneous debris. Prior to any development done at this site an Environmental Assessment will have to be performed and any contamination on site will have to be mitigated; it has been stated by FWC officials that there are funds available for this remediation. However, taking into account the past industrial practices surrounding this site, there is a potential that extensive pollution may be found which may impact the ability of the current funding allotment to be inadequate to address the potential contamination issues. It is important to clarify that a thorough environmental assessment has not yet been performed and, therefore, this is only a potential concern. On the other hand, a benefit of approving the use of this site for the proposed hatchery may be that an invasive species filled, underutilized and potentially polluted parcel in the City will be cleaned up and put to use.

FISHERIES

There is no doubt that fisheries are declining on a global scale, including in the Pensacola Bay system. However, there is little evidence in scientific literature that hatchery operations augment native fish populations rather than replacing them. While advances in the process have led to significantly reduced impacts, more research is needed to determine if hatcheries can be successful in helping to restore fish populations. While the proposed hatchery project will add to that research needed and add to the tool belt of fisheries managers, whether this hatchery will actually address the “loss of use” derived from the Deepwater Horizon oil spill is yet to be determined.

The proposed fish hatchery will be constructed in an effort to replenish our fish populations that were impacted by the Deepwater Horizon oil spill. Although fish populations were impacted in part by the oil spill, they were also impacted long before that. Historically, our waterways have been impacted by stormwater runoff and sedimentation that has caused the loss of seagrass beds, critical habitat for many of our local fish and invertebrates. It is undeniable that reducing pollution coming into Pensacola Bay, while also restoring critical habitat, would not only be a significant benefit to our community, but would also help to address the “loss of use” of our fisheries cause by the Deepwater Horizon oil spill.

A main concern with hatchery raised species is in the area of genetics. Selective fishing on stocks, genetic change in enhanced stocks, species extinction, disruptions to ecosystems, and removal of non-target species due to genetic dilution are a few of the potential concerns found in scientific literature. Complicating this issue is the fact that genetic impacts have been difficult to demonstrate in wild populations, due to the ability of species to respond to both biological and physical parameters as well as selection pressures of changing environments. Measured genetic impacts in managed fisheries range from no detectable change to complete replacement of local stocks. Also, when/if released in large numbers, hatchery-raised fish can compete with wild populations for food and habitat, further harming wild populations. This range of possible impacts makes it difficult to predict whether or not a fish hatchery will actually address the harm of “loss of use” caused by the Deepwater Horizon oil spill.

One of the main components of genetic issues involves species fitness. Over the course of millennia, wild species have developed fitness mechanisms which allow them to respond to changes in their environment. Those species which are the fittest will pass those mechanisms off to their offspring (they will have a greater chance of reproduction). There is evidence in scientific literature that hatchery fish tend to be less fit than wild fish. It is therefore a possibility that interbreeding between wild populations and hatchery populations will actually threaten the viability of wild populations as it may lead to less reproductive viability of wild species, further exacerbating our declining fisheries. There are some studies involving freshwater hatchery operations which have shown that genetic impacts on wild populations are unavoidable; other studies suggest that the use of local, wild fish for brood stock will help to mitigate some of these negative genetic impacts. (Fortunately FWC is proposing using local fish for brood stock at the facility on Bruce Beach to reduce potential genetic impacts). It has been said that a fish hatchery is not the answer to our fisheries management issues, rather it is a tool in the toolbox of many approaches that are needed (notably water quality improvement and critical habitat restoration). It can also be said that by introducing potentially less fit species into the genetic pool, fish hatcheries may remove tools needed for wild populations to survive, increasing the need for additional hatcheries. It is imperative that the facility take into account best management practices and stay committed to reducing the potential genetic impacts of another hatchery in the northern Gulf of Mexico There are means of avoiding genetic impacts to wild fisheries which must be incorporated into the facility operation plan and will be addressed by the Technical Coordination Committee proposed by FWC for the facility. It is certainly in the City’s best interest to play an active role on that committee.

The interest in stock-enhancement programs continues to grow as more and more fisheries continue to decline. Most programs involve the release of juveniles reared in hatcheries (although some focus on the collection, rearing, and transplanted of wild juveniles) aimed at increasing recruitment to levels

approaching the carrying capacity of the habitat; optimized release strategies and increased fitness for life in the wild are required. Research does show however that decisions to use stock enhancement should be based on thorough pilot studies, including analyses of the range of projected economic and social benefits. As previously stated, there is not enough scientific information available to determine whether the potential benefits outweigh the potential gains associated with the release of hatchery fish at this time; so currently this proposal is a scientific experiment which will add to the improved understanding of stock enhancement programs and the mitigation of the negative impacts of those programs.

WATER QUALITY

Conflicts over surface water supplies and their management practices (e.g. increased withdrawal in certain areas at the expense of others) may arise. According to the PEIS water withdrawal and discharge will be limited (80% will be recirculated); however, amounts will not be known until the permitting process begins.

Pensacola Bay is listed by the EPA as an impaired body of water; there are several water quality parameters which may be impacted by the effluent coming from the proposed hatchery including, but not limited to, Biological Oxygen Demand, Total Dissolved Solids, Total Suspended Solids, Dissolved Oxygen, Ionized Ammonia, Total Nitrogen and Phosphorus. The fish hatchery is proposing water re-use in their processes as well as a two-fold filtration process and marsh filtration prior to discharge. While some elimination or alleviation of pollutants from the effluent discharge may occur, it cannot be said with certainty it will be enough. An increase in nutrients to a Bay system which already suffers from high nutrient levels is not within our communities' best interest. The use of a closed system (100% recirculated and no discharge into the Bay) is the only way to completely avoid potential water quality impacts (not currently being proposed).

A small wetland with marsh grasses is proposed to be constructed to help filter the effluent before reaching the Bay, along with potentially providing emergent grass vegetation for other ecosystem restoration projects. It should be noted that while these emergent grasses will help to reduce the pollution load entering Pensacola Bay, they will not contribute to the desperately needed submerged seagrass habitat restoration needs of Pensacola Bay which is reported to be missing 90% of historic seagrass beds. Considering nearly all sport fish and their prey spend some time in seagrass beds in their life, it can be said that one of the most significant stressors for wild fish populations is lack of critical habitat to support a larger population, not a lack of ability to reproduce.

The use of large quantities of fish meal, antibiotics, drugs, hormones, parasiticides, herbicides and other chemical / dangerous products, anti-fouling agents or pesticides, as well as with water-borne diseases and infections sometimes associated with hatchery operations are other potential threats to water quality. While FWC officials have stated these practices will not be used at this facility, they are potential impacts which have been found at other hatchery sites.

When asked about diseased fish Gil McRea (FWC) had this response: "There are a number of diseases that one has to be concerned about in fish culture. We are raising fish in tanks for only a short time,

which minimized the likelihood of disease, and all fish must be certified by an aquatic animal vet prior to release. If there is evidence of disease, the fish will not be released.” Also in response to a question raised by League of Women Voters he said: “No drugs will be used in our spawning operation – we are simply altering water temperature and photoperiod (day length) to mimic natural spawning cues out in the wild.”

Due to the fact that the permitting process will not happen for some time it is impossible to tell what the definite water quality impacts may be as we do not know what exactly will be permitted to be discharged. If we take the Tampa Bay Hatchery project as an example water quality may actually be improved for some pollutants, while impaired by others (notable nutrients). However, the potential improvement to water quality can easily be negated by a large storm washing the contents of the settling pond into Pensacola Bay. A Hurricane management plan should be a stipulation of any lease agreement or MOU to avoid this potential impact.

RESEARCH AND EDUCATION

The potential for improved understanding of fisheries management issues, ecosystem restoration, water quality, etc through research at this facility is undeniable. However, these components appear to be in the background of the larger funded project of raising fish. In order to ensure that these undeniable benefits remain a vital part of this project, Council could consider making them a critical stipulation of a lease agreement or MOU. Educating the public about the need to protect and improve water quality and critical coastal habitat will have long-term and far reaching benefits which may even better address the “loss of use” than raising and releasing fish into the northern Gulf of Mexico. When Council originally approved the negotiation of a lease at this site the education component was much larger and more comprehensive.

While the funding from BP covers the operation costs of a hatchery for five years, FWC is committed to running the facility long after the current five year funded project. The City of Pensacola can and should play a significant role in determining what should be done at this facility, not only during the five year funded project, but also once the five years of hatchery funding is exhausted. FWC has proposed a second committee, the Planning Coordination Committee, which will help to guide the project before inception and during operations. It would be imperative for the City to have an active role in this committee (regardless of where the hatchery ultimately gets built) in order to ensure that the project be planned and managed with the best interest of City residents and our surrounding communities in mind.

The educational component of the facility could be expanded back to the initial proposal that outlined a larger educational component. Ideally the establishment of a National Estuarine Research Reserve System (NERRS) Science Collaborative could address the concerns mentioned above as well as assisting our coastal community (along with all others along the Gulf of Mexico) to cope with the impacts of land use change, pollution, habitat degradation and a changing climate. In addition, NERRS has a well - established Living Classrooms & Living Laboratories program which offers a convergence of such fields as Earth systems science, biology, chemistry, geography, geology and marine science. For example, students develop math skills through detailed measurements, modeling phenomena such as growth and

cyclical variation, and analyzing data to make comparisons across multiple estuaries. They develop language skills as they read and write about estuary-related topics and communicate their explorations and findings with other students and scientists. Since estuaries have also played a significant role in human settlement, exploration and development (including in Pensacola), students gain new eyes on human history, geography and culture.

Pensacola has a rich cultural history surrounding our Bays and fisheries. Incorporating an effective educational program which helps to bring light to the myriad of issues surrounding the health of Pensacola and neighboring Bays into a lease agreement or Memorandum of Agreement is one way that Council can ensure that the most popular (and arguably most effective) components of the proposed project remain a vital component to this project in the long-term.

OTHER

In August 2012, the Pensacola City Council passed a green building ordinance that incentivizes the construction of green buildings and neighborhoods by the private sector and requires it for City projects. The City's green building standards are outlined in the Code of Ordinances, CHAPTER 14-1. BUILDING CONSTRUCTION STANDARDS, ARTICLE XIII. GREEN BUILDING CERTIFICATION. Section 14-1-295 of the standards states:

New commercial, industrial, and institutional buildings that are owned, funded, or sponsored by the city shall satisfy all of the requirements associated with either:

- (1) The current Green Commercial Building Standard of the FGBC; or
- (2) The current LEED for Core and Shell program; or
- (3) The current LEED for New Construction or derived USGBC LEED rating system (e.g., LEED for Schools, LEED for Health Care, LEED for Retail); or
- (4) An equivalent program using as a standard equivalent green building certification analysis.

Under City code, the proposed hatchery facility, which would be a "City sponsored building", must be built to a green building standard. Any lease agreement should include a requirement that the building attain a LEED certification so that the City is fully in compliance with its own green building ordinance.