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Apalachicola Bay
Oyster Situation Report

Executive Summary

Apalachicola Bay Oyster Situation Report

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EXECUTIVE SUMMARY

This report summarizes efforts conducted through the University of Florida Oyster Recovery Team, in collaboration with various stakeholders, to describe conditions in Apalachicola Bay prior to and after a historic collapse of the oyster fishery. The report characterizes conditions in the bay, reviews possible causes for the fishery collapse, and outlines a plan for future monitoring, research and fishery management. Conclusions in this report are based on analyses of data collected in historical monitoring programs conducted by the Florida Fish and Wildlife Conservation Commission, Florida Department of Agriculture and Consumer Services, Apalachicola National Estuarine Research Reserve (Florida DEP) and Northwest Florida Water Management District, as well as field, experimental, and community data collected by the authors, who are reporting in their capacity as members of the UF Oyster Recovery Team.

Findings

- Apalachicola River discharge levels are strongly influenced by rainfall over the Apalachicola-Chattahoochee-Flint River Basin. The lower part of this basin was frequently classified by the National Integrated Drought Information System as in an 'exceptional drought' during the last three years.
- Water quality data indicate that 2012 was a year of high salinity at all monitoring stations in the bay likely caused by low river flows and limited local rainfall in most months.
- A large decline in oyster landings was reported after August 2012 in the bay, and the number of reported oyster harvesting trips also dropped off each month during the second half of that year.
- The 2012 decline in oyster landings and recruitment of juvenile oysters is unprecedented during the period of data analyzed and has likely involved recruitment failure or high mortality of small oysters.
- Fisheries independent monitoring data, collected by state agencies, indicates a general downward trend in abundance of legal-sized (3 inch or larger) oysters in the bay in recent years and a large decline in sub-legal (smaller than 3 inches) oysters present in 2012.
- Because of the low abundance of sub-legal oysters in 2012 there is a high likelihood that legal-sized oysters will be in low abundance in 2013 and likely in 2014 as well.
- The current size limit of 3 inches appears to be effective at reducing the risk of "growth overfishing" where yield (pounds of meat harvested) is reduced because

oysters are harvested at too small a size. However, it is essential that this size limit be accepted by the community, adopted by the industry, and enforced by regulatory agencies and the county judicial system. Substantial future harvesting of sub-legal oysters could have negative effects not only on oyster populations but also a serious impact on the national reputation of Apalachicola oysters as a high-quality seafood product.

- Oysters, white shrimp, brown shrimp, blue crab and multiple finfish species have been analyzed for the presence of oil residue. All samples were either below the limits of detection or below quantifiable limits. Thus, based on analyses conducted so far, there is no evidence of chemical contamination from the Deepwater Horizon oil spill in the seafood sampled from Apalachicola Bay.
- A large percentage of oysters in the bay have some degree of shell parasitism by clams, polychaete worms, sponges or other organisms. This parasitism negatively affects the integrity and aesthetics of the oyster shell, the overall growth and productivity of the oysters, and the economic value of product bound for the half-shell market. There are no historic data to compare degree of shell parasitism observed in 2012-2013.

Recommendations

Monitoring

- There is a need to continue the monitoring of oysters in Apalachicola Bay, both in terms of tracking landings reported by oystermen, and in the sampling done by state agencies. The fisheries independent monitoring program needs to be expanded in its spatial extent to include all of the bay where oyster bars occur, including areas that are closed to fishing, because these may represent important sources of oyster spat.
- Oysters should be included on the list of invertebrate species routinely assessed by Fish and Wildlife Research Institute (FWRI) stock assessment staff. These assessments can identify persistent uncertainties in oyster ecology or population status and help guide research such as the relationship between Apalachicola River flows and juvenile oyster survival rate or culling mortality.

Management and Restoration

- Acceptance by the community and industry, and enforcement and adjudication of rules regarding size limits, spatial restrictions, and weekly and seasonal closures is essential for these measures to be effective in sustaining the oyster population.
- Throughout our work on this project there were persistent reports of high levels of unreported harvest and illegal harvest from closed areas. While tangible evidence of illegal activity is not available, it is clear from our simulation models that lack of compliance with current regulations could greatly reduce the likelihood of Apalachicola Bay oyster populations returning to historic population levels, regardless of management action taken.
- Oyster leases should be explored as a possible alternative to open-access fisheries. The concept of TURF (Territorial User Rights Fisheries) as a lease arrangement could be appealing to oyster fishermen and help promote restoration actions such as re-shelling because the fishermen would benefit directly from the restoration activities they were engaged in by having a “share” of the restored area (the lease) to manage and harvest from.
- The total current area of oyster bar in Apalachicola Bay that is not open to fishing is unknown, and the degree to which this area is the source of the oyster spat for the entire bay also is unknown. If this area is small or declining, then large-scale oyster relay from these closed areas to areas open to fishing may reduce the total spat available throughout Apalachicola Bay, increasing the risk of “recruitment overfishing” where harvests of adults could influence availability of future spat.
- Therefore, the practice of ‘relaying’ should be carefully evaluated in regard to its short-term benefits versus potential longer-term negative impacts to the fishery—in other words, whether or not it is depleting a substantive portion of the source population of oyster spat.
- Management actions such as shell planting could expedite the recovery of Apalachicola Bay oyster resources. However, a new modeling tool called ECOSPACE, brought forward by the UF Oyster Recovery Team, suggests that shell planting needs to be conducted at a considerably greater scale than current levels to be effective—approximately 200 acres per year for a 5-year period. A very important uncertainty is whether shell planting should concentrate large amounts of shell in small areas to create thick layers of shell or whether shell should be spread over larger areas but not in as thick a shell layer. Restoration should be done in a manner that provides information on efficacy and cost-effectiveness of different shelling strategies, including evaluating different densities of shelling and different kinds of shell material.
- A participatory decision-making process, involving SMARRT (the Seafood Management Assistance Resource and Recovery Team), relevant state agencies and experts from the state university system is needed to support long-term management of the oyster fishery in a more robust manner. The ECOSPACE model could further support members of SMARRT and management agencies to screen different policy or restoration alternatives.

Research

- Research is needed to identify an optimal approach for monitoring long-term settlement, juvenile and adult survival, productivity, health, mortality, oyster diseases, and product quality of oysters. Subsequently this information could be used to inform changes in the oyster monitoring program.
- Research is needed to quantify how oyster population dynamics, product quality and the fishery are affected

- by interactions between river flow, nutrients, salinity, harvesting intensity and restoration methods.
- There is a need to assess the harvesting practices of the oystermen and how they respond to changes in oyster abundance.
- The ECOSPACE model has additional functionality to identify effects of varying flow regimes and to screen flow alternatives, relative to Apalachicola Bay oyster population dynamics and harvest potential when the model is linked with the Apalachicola Basin River Model currently being used by the Apalachicola-Chattahoochee-Flint River Stakeholders Group.

Outreach and Education

- A community-based outreach and education program is needed to foster actions consistent with supporting a sustainable bay ecosystem and economy.
- Involvement of oyster harvesters and processers in research and restoration projects can aid in educating the entire community about bay stewardship.

The Future

The situation in Apalachicola Bay, as outlined in the pages of this report, highlights a series of interwoven ecologic, fisheries, and community concerns. The bay is a national treasure, and its demise would sever critical links among our modern society, nature and our heritage. Work to date is a starting point toward understanding the processes underlying the current crisis, and includes steps that can and should be taken in initial efforts to restore the bay. However, if we are truly committed to bringing the bay back to a point even close to its former productivity, a great deal of work is still required. These studies and analyses were conducted on a shoestring budget with internal funds from UF/IFAS, and limited support from Florida Sea Grant and from the National Institute of Environmental Health Sciences. If we are truly committed to the restoration of the bay, we can't stop here. There is a critical need for follow-up work, bringing together state and federal agencies, academic researchers, and the community, to look out over a 5-, 10-, and 20-year time scale, to conduct interventions, do the necessary research, and monitor outcomes. This will require a strong leadership structure and it will cost money. The question remains as to whether we, as a society, are willing to make this investment of time, and money, to preserve this priceless natural resource for our lifetime, and the lifetimes of our children.

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