MARYLAND OYSTER ADVISORY COMMISSION
LAND USE SUBCOMMITTEE
FINDINGS AND RECOMMENTATIONS

Land Use Subcommittee

Charge: Work collaboratively with the Bay Program Sustainable Fisheries Goal Implementation Team and others to educate local land-use planners and decision makers about the importance of land use decisions to oysters.

Outcome: Provide an overview of the connections between land use and oyster restoration, making recommendations that inform land use decisions to improve the success of oyster restoration.

Approach:

The Land Use Subcommittee utilized the resources of the NOAA Chesapeake Bay Office to conduct a literature review on oyster restoration connections with land use. Dr. Peter Bergstrom led this effort and produced a white paper on the subject. This information was presented to Maryland Oyster Advisory Commission (OAC) on October 23, 2013. Using this and other information, the Land Use Subcommittee drafted the following set of findings and recommendations for consideration by the OAC.

Findings

- The Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team (Fish GIT) has identified land use as a significant concern for maintaining healthy and sustainable fish and shellfish populations.
- There is overall consensus that development and urbanization negatively impact the health of coastal environments, which impairs vital ecosystem functions such as nursery grounds and feeding areas for aquatic species, nutrient recycling, and water purification (Chapman et al. 2009; Center for Watershed Protection 2003).
- Harmful algal blooms caused by high levels of nitrogen can kill or inhibit growth at all stages of an oyster's life cycle, and in some cases if the algal bloom is very dense, the coverage can smother shallow oyster beds (Eastern Oyster Biological Review Team 2007; Soletchnik et al. 2007)
- High impervious surface values (in excess of 20%) in watersheds are not conducive to healthy oysters, due to sediment, bacteria, hypoxia, and contaminant impacts. These urban and urbanizing watersheds have stream flows that are "flashy" (either high volumes during storm events or low volumes during drought), leading to increased or decreased flows that affect salinity and create higher inputs of sediment and toxics.
- While it difficult to directly link specific land use stressors to resulting impacts on oyster health, highly urbanized or high intensity land uses (e.g., industrial, commercial or intensive agricultural

operations such as feedlots) result in higher loads of pollution that decrease available habitat (e.g., through sedimentation and eutrophication) or contribute contaminants (e.g., bacteria) that can preclude oyster survival or make oysters unsuitable for consumption. Even though bacteria do not harm oysters directly, they are indicators of potential harm to people who eat them, and the harvest closures due to their elevated levels have impacts on the shellfish industry, both for wild harvest and for aquaculture.

- Sedimentation is particularly problematic as historic oyster bottom habitat (hard surface) is covered with silt. Sediment can also be re-suspended as a result of dredging operations. This can cause other problems, such as re-suspension of nutrients or contaminants buried under layers of silt deposits.
- Changing land use patterns can cause conflicts with siting the growing number of aquaculture operations:
    1. Not in My Back Yard (NIMBY) land owners who are concerned with their waterfront property views or aesthetics; and,
    2. Declines in water quality near existing and future aquaculture operations.

  Geospatial tools are being developed to predict and map these risks under the "Planning Tools for Aquaculture Expansion and Management within the Chesapeake Bay" project of Marcia Berman at VIMS.

Recommendations

- Maryland DNR should consider current and future land use in the prioritization of oyster sanctuary restoration. Maryland DNR should collaborate with the MD Department of Planning and MD Department of the Environment to ensure that future growth projections and water quality considerations are part of this evaluation.
- The model of Maryland's Greenprint, used to establish Targeted Ecological Areas (representing lands and watersheds of high ecological value that have been identified as conservation priorities by the Maryland Department of Natural Resources (DNR)) should be applied in the context of a "Blueprint" that identifies similar priorities for aquatic habitats of high ecological value and potential for healthy oyster populations.
- The Maryland Department of the Environment should consider oyster reef protection in the execution of Watershed Implementation Plans required by the Total Maximum Daily Load provisions of the Clean Water Act. That is, plans should be implemented first where they will achieve maximum ecological return on investment, including oyster reef habitat preservation.
- MD DNR, Department of Planning and MDE should collaborate to develop a guide for local land use planners and decision makers on the importance of oyster reef habitat for fish habitat, water quality preservation and enhancement, and other valuable ecosystem services. This guide should distributed through a concerted outreach campaign to local jurisdictions that are proximate to existing oyster reef sanctuaries or adjacent to the extensive restoration underway in the Choptank River complex.

- Maryland has developed new policies to address the siting of onsite wastewater treatment (septic) systems. MD DNR should ensure that MDE continues to address failing or failed septic systems that can contaminate surface and groundwater, ultimately posing risks and problems with shellfish contamination.
- The OAC should invite Marcia Berman to provide a briefing on the "Planning Tools for Aquaculture Expansion and Management within the Chesapeake Bay" project and provide guidance on the development and application of the tool in Maryland waters. The primary objective of the projects is to enhance the abilities of states to manage, monitor and report activities associated with shellfish aquaculture. A geospatial model developed previously for Virginia will be updated for the state and expanded into Maryland waters. This model supports a desire to expand the aquaculture industry in both states by mapping areas suitable for aquaculture using data that considers physical, biological, anthropogenic, and regulatory constraints on the industry's activities. The model also considers the vulnerability of the industry to land use decisions at the local level.