



## Patuxent Wildlife Research Center Science Brief for Resource Managers

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Science Brief PWRC 2003-37

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## SAV Restoration and Ecosystem Research

### Description:

The Chesapeake Bay is the nation's largest estuary and one of the most productive in the world. The Bay contains over 295 species of finfish and 45 species of shellfish, which results in the third largest fishery catch in the US, trailing only catches recorded in the Atlantic and Pacific Oceans. The Bay serves as the spawning ground for 70 to 90 percent of the striped bass in the Atlantic ocean and provides recreational fishing to one million people, at an estimated economic value of \$1 billion per year. Unfortunately, the commercial, economic and recreational value of the Bay has been threatened by over harvesting of living resources, loss of habitat, and degradation of water quality. Submerged aquatic vegetation (SAV) is a keystone element of the Chesapeake Bay ecosystem. SAV provides shelter for at least some life stages of nearly all the aquatic species in the Bay and is required habitat for many species. SAV species provide food for diving ducks. Beds of SAV were lost from the Chesapeake Bay as development increased and discharges of nutrients and suspended solids reduced light transmittance. Large efforts in many quarters, by conservation groups and state and federal agencies, are currently underway in attempts to restore SAV populations throughout the Bay. The current effort is aimed at providing relevant information on SAV ecosystems in several areas: 1) understand the links between SAV beds and their environmental requirement and 2) refine our understanding of the linkages between SAV and other living resources within the Bay.

### Progress to Date:

A study of the trophic linkages within the shallow water and SAV habitats was initiated in 1999. Stable isotope ratio technology will be used to fingerprint trophic levels and trophic connections. A symposium on "The State of Bay Science: Advances and Challenges for Aquatic and wetland resources of the Chesapeake Bay" was organized, with speakers representing the expertise in science and management

within the Bay community; the symposium was held in conjunction with the annual conference of the Society of Wetland Scientists in June, 1999 in Norfolk, VA. A two-year inventory of stable isotope measurements was completed and samples prepared and sent for laboratory analyses at the USGS National Center in Reston, VA. Samples of benthos, plankton and water were replicated on each of 3 annual sampling dates at 4 locations in the Bay. Three ancillary studies were conducted using stable isotope techniques that 1) investigated the resource dependencies of wintering diving ducks in Chesapeake Bay, 2) examined the food habits on an annual cycle of invasive mute swans, and 3) documented the isotopic signature of osprey as a representative top Bay consumer.

### Management Implications:

Findings of this study will potentially provide a better understanding of the trophic relationships and thus interdependencies between producers and consumers, predators and prey in the Chesapeake Bay ecosystem. Potentially the data set can be used as a sounding board to ask many questions about the trophic status and resilience of species that may occupy different salinity provinces of the Chesapeake Bay.

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