Potentially Attainable

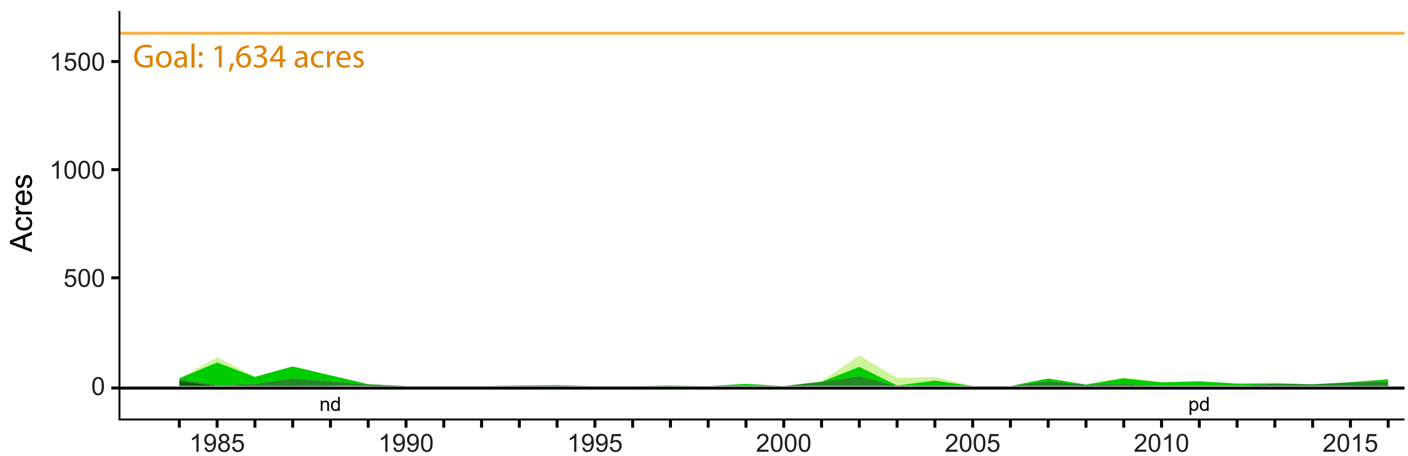
Lower Patuxent River (PAXMH1-6)

Submerged aquatic vegetation (SAV) beds have been sparse over the course of the Chesapeake Bay-wide aerial survey within the lower Patuxent River.

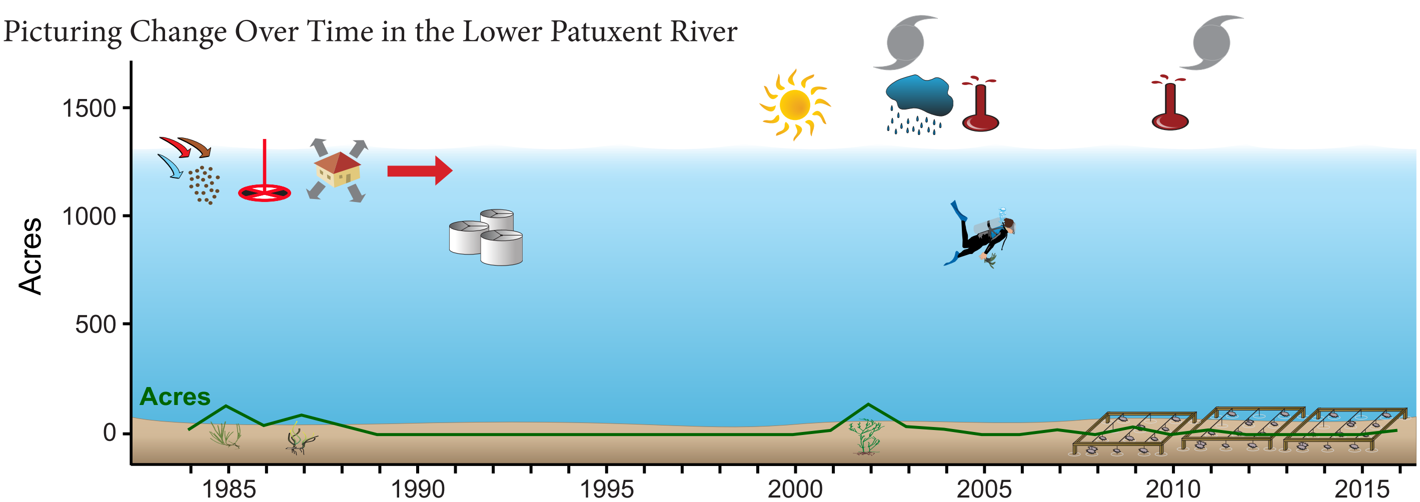
Executive Summary

The mesohaline section of the Patuxent River once supported dense beds of eelgrass and most likely widgeongrass. These beds were declining by the mid-1900s due to excessive pollution from upriver sewage discharges and runoff from unabated development and by 1970, they were virtually absent. Any remaining beds were lost due to Tropical Storm Agnes in 1972. Advanced wastewater treatment, established in the early 1990s, contributed to significant improvements in water quality, which led to the resurgence of SAV in the mid-1990s in the upper Patuxent River. Despite this, no significant recovery occurred in the mesohaline section and SAV never attained the restoration goal of 1,634 acres.

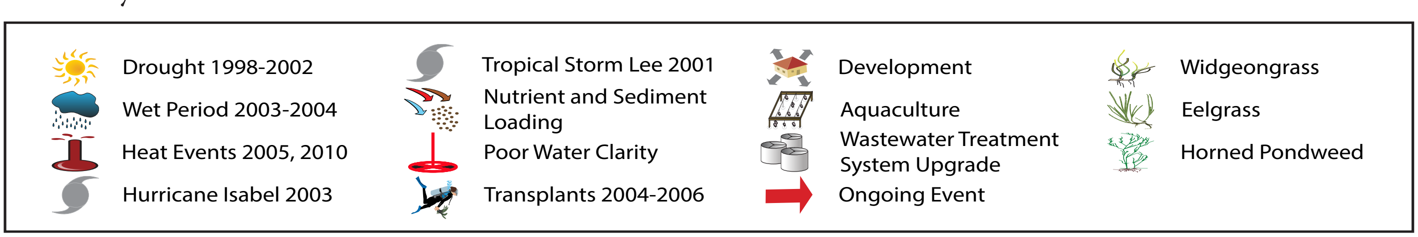
SAV Acres and Density



Picturing Change Over Time in the Lower Patuxent River



Key



Potentially Attainable

Take Home Points

Goal - Potentially Attainable

The goal of 1,634 acres has never been achieved. Attainment may be reached but only with significant improvements in water quality. The recent expansion of widgeongrass may help facilitate the recovery process.

Historical Coverage

SAV well documented as abundant until the 1960s

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Key Events

Tropical Storm Agnes

In June 1972, Tropical Storm Agnes resulted in the loss of any remaining eelgrass beds, as well as most other SAV beds in this segment.

Transplant projects

A significant number of transplant projects were conducted with both adult eelgrass plants and seeds primarily in the lower Patuxent River along the north shore region. These projects were extensive large-scale efforts using seeds in 2004, 2005 and 2006. While short-term success was noted with some of the projects, there was no long-term success (> five years).

Senator Bernie Fowler's 'Sneaker Index'

Each June, Senator Bernie Fowler will wade into the Patuxent River near Broomes Island, Maryland to measure water clarity with his sneakers, now called the 'sneaker index'. In the 1950s and 1960s, the index approached or exceeded five feet. Since the sneaker index was initiated in 1988, it has improved but has never attained the clarity noted in the 1950s.

Vulnerability/Resilience

Water clarity

Water clarity is critical to SAV survival and unless this improves, SAV will have difficulty surviving here.

Eelgrass is susceptible to heat events

Eelgrass is a cold-water SAV species in the Bay near its southern distributional boundary in the mid-Atlantic and is susceptible to extreme summertime temperatures. This was noted in August 2005 and June 2010. For eelgrass to recover and persist, water clarity must significantly improve to offset the higher water temperatures.

Oyster aquaculture and soft clam wild harvest

Oyster aquaculture has been rapidly expanding in this region, and could provide a boost to the local economy, help replace declining wild stocks and lead to water clarity improvements due to biofiltration. Shellfish aquaculture operations that occupy shallow water habitat that is also potential SAV habitat, however, could limit the recovery of SAV into those areas if water clarity improvements lead to an SAV resurgence. Wild harvesting of soft clams by mechanical harvesting could destroy recolonizing beds or even prevent plants from establishing.

Management Implications

Nutrient and sediment reductions; wastewater treatment plant upgrades

Managers will need to focus on reducing nutrients and sediment for SAV to significantly improve. Much of the nutrient pollution to this river is processed by the Western Branch Waste Water Treatment Plant (WWTP). Although improvements have been made to the WWTP over the years, any future technological advancement in wastewater treatment should be employed here to further reduce nitrogen and phosphorus pollution to the river, particularly if additional development of the watershed occurs. If development can be balanced by additional nutrient removal, some of the stressors associated with development (reduced water quality and clarity) may be mitigated to favor conditions conducive to SAV recovery. Additionally, efforts to maintain separate systems for stormwater overflow are critical to reduce nutrient and sediment levels in this river.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2004; Stankelis et al. 2003; Orth et al. 2010a, 2010b, 2017; Patrick and Weller 2015; Lefcheck et al. 2017, 2018

www.vims.edu/bio/sav/SegmentAreaChart.htm (abundance data)

www.vims.edu/bio/sav/maps.html (species information)

www.eyesonthebay.org (Maryland water quality data)