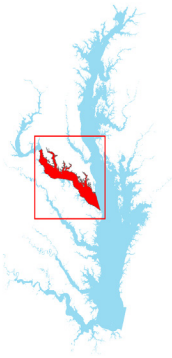
Potentially Attainable

Lower Potomac River, Maryland (POTMH-MD)

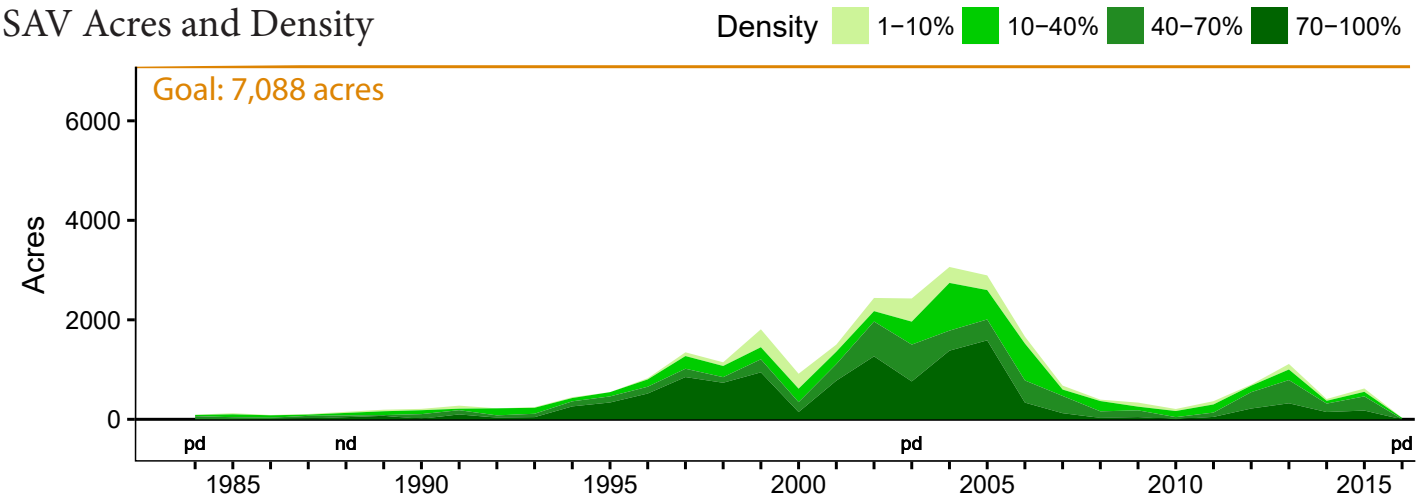


Beginning in the mid-1990s and continuing through 2001, submerged aquatic vegetation (SAV) beds dominated by a rich mix of species surged along this entire segment, but have now subsequently declined.

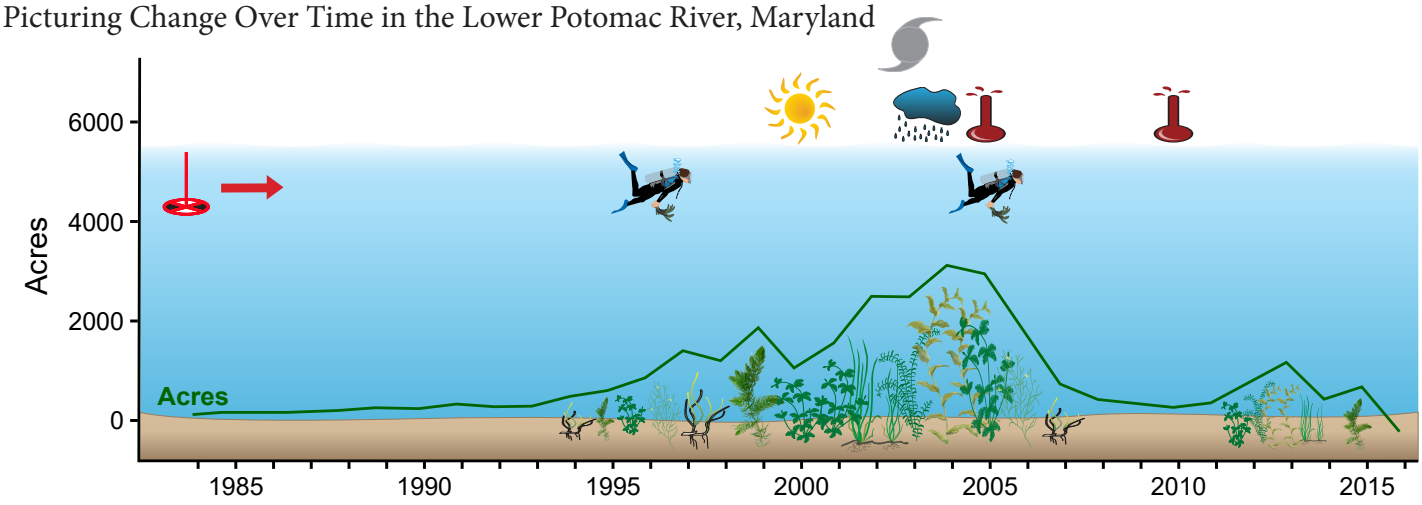
Executive Summary

Eelgrass and widgeongrass likely dominated the shoal areas of the Maryland portion of the lower mesohaline (higher salinity) Potomac River, where acreage probably achieved maximum coverage in the 1950s and 1960s, during the driest period recorded in recent history. The upper mesohaline, however, likely supported a variety of freshwater and low salinity tolerant species. A significant expansion of the non-native milfoil occurred in the 1950s, but the plant disappeared in the mid- to late 1960s. Although other species were noted in the 1960s, Tropical Storm Agnes in 1972 triggered a decline in any remaining SAV in this segment. Recent SAV coverage showed a modest resurgence beginning in the mid-1990s that continued through 2005, with reduced coverage occurring in subsequent years. The only way to reach the restoration goal of 7,088 acres of SAV in this segment is to significantly improve water clarity during the spring and summer growing season, when turbidity levels are normally the highest. It may be possible, given adequate improvements in water clarity, to see a resurgence of widgeongrass in the shallow areas of the smaller tributaries, as well as both native and non-native grasses in the fresher waters of the upper mesohaline portion of the river. Physical constraints including variably high salinity and turbidity may continue to limit SAV growth.

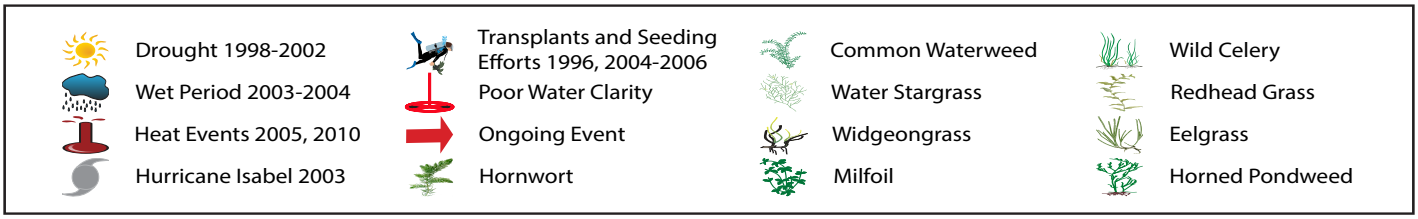
SAV Acres and Density



Picturing Change Over Time in the Lower Potomac River, Maryland



Key



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Take Home Points

Goal - Potentially Attainable

The goal of 7,088 acres has never been achieved. It is potentially attainable if water clarity is significantly improved.

Historical Coverage

Historical coverage somewhat well known

Herbarium specimens from the 1890s, 1920s and 1930s indicate that widgeongrass, redhead grass, sago pondweed and wild celery were present in the lower portion of the Potomac River during those time periods. In the 1950s, non-native milfoil expanded rapidly and covered large areas of shallow water in the middle, fresher areas of this segment, but ultimately, milfoil disappeared in the mid- to late 1960s. Additional species information from surveys that took place in the 1960s and 1970s show that several species were present in areas throughout the lower Potomac River, with eelgrass found as far north as Swan Point along with redhead grass, widgeongrass and sago pondweed. Other species observed in the freshwater reaches of tributaries of the lower Potomac River during that time period include horned pondweed, wild celery, common waterweed and naiads. Most SAV, however, disappeared in the wake of Tropical Storm Agnes in 1972.

The Chesapeake Bay-wide aerial surveys revealed a significant resurgence of SAV in several areas of the mesohaline lower Potomac River in the mid-1990s. Multiple species were recorded, including widgeongrass, water stargrass, hornwort, milfoil, common waterweed, redhead grass, wild celery and horned pondweed. This resurgence peaked in 2004 with 3,062 acres mapped for the entire segment. Widgeongrass dominated the St. Mary's River with eelgrass present primarily from transplant efforts. Widgeongrass dominated the north shore up to and including Breton and St. Clements bays. The above-noted freshwater species were found from the Wicomico River north to Picowaxen Creek. SAV abundance began to decrease in 2005, reaching a low of 207 acres in 2010. Since then, expansion has been minimal.

Key Events

Milfoil expansion in the 1950s and 1960s

Milfoil expanded rapidly in the middle of this segment in the late 1950s through the early 1960s, but it disappeared by the middle of the decade. Milfoil made a modest reappearance in the mid-1990s but it eventually died out again. The expansion may have led to the temporary exclusion of some native species but may have also contributed to the subsequent recovery of native species by improving water clarity, stabilizing sediment and trapping seeds.

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 St. Mary's River beginning in 1996, with extensive large-scale efforts using seeds in 2004, 2005 and 2006. Another large-scale effort using adult plants took place off Piney Point in 2004 and 2005. While short-term success was noted with some of the projects, the projects were not successful in the long-term (> five years).

Vulnerability/Resilience

Water clarity

High turbidity and poor water clarity persist in the lower Potomac River during the spring and summer due to nutrient and sediment pollution, especially in the upper portion of this segment. In the lower portion, summertime phytoplankton blooms can occur.

Salinity

The lower Potomac River is in an important transition area that is susceptible to fluctuations in salinity which could affect the composition of SAV beds in this segment.

Eelgrass is susceptible to heat events

Eelgrass is a cold-water SAV species and in the Bay, it is near its southern distributional boundary in the mid-Atlantic. Widgeongrass, however, is much more tolerant to temperature extremes than eelgrass, and if it can colonize some of the shallower areas in this portion of the Potomac River, it may be a suitable replacement in habitats previously dominated by eelgrass. Widgeongrass populations can be highly variable on an annual basis, however, and are expected to fluctuate in an increasingly warmer Bay. Widgeongrass also typically requires more light for growth than eelgrass and therefore its expansion may be most evident in the shallowest nearshore SAV habitats.

Management Implications

Nutrient and sediment reductions

Managers will need to focus on improving water clarity by reducing sediment and nutrient pollution in both the mainstem and tributaries of the Bay. Managers will be unable to do much about temperature as this is a global issue. By improving water clarity, however, plants may be able to tolerate periods of warmer water or variability in salinity.

References

Pfitzenmeyer and Drobeck 1963; Bayley et al. 1978; Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2004; Golden et al. 2010; Orth et al. 2010a, 2010b, 2017; Tanner et al. 2010; 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 (for water quality in the Maryland waters)