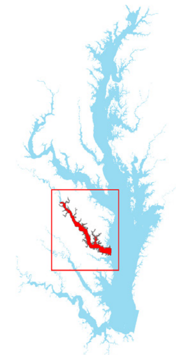
Potentially Attainable

Lower Rappahannock River (RPPMH, CRRMH)

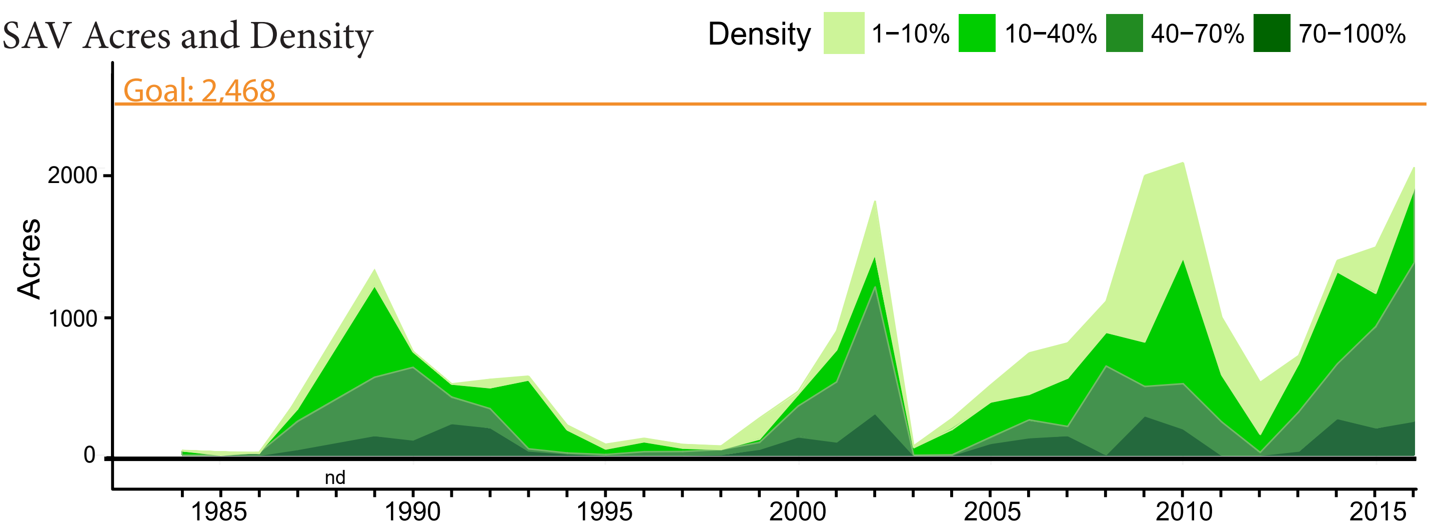


Submerged aquatic vegetation (SAV) beds along the lower Rappahannock and Corrotoman rivers are now dominated by widgeongrass.

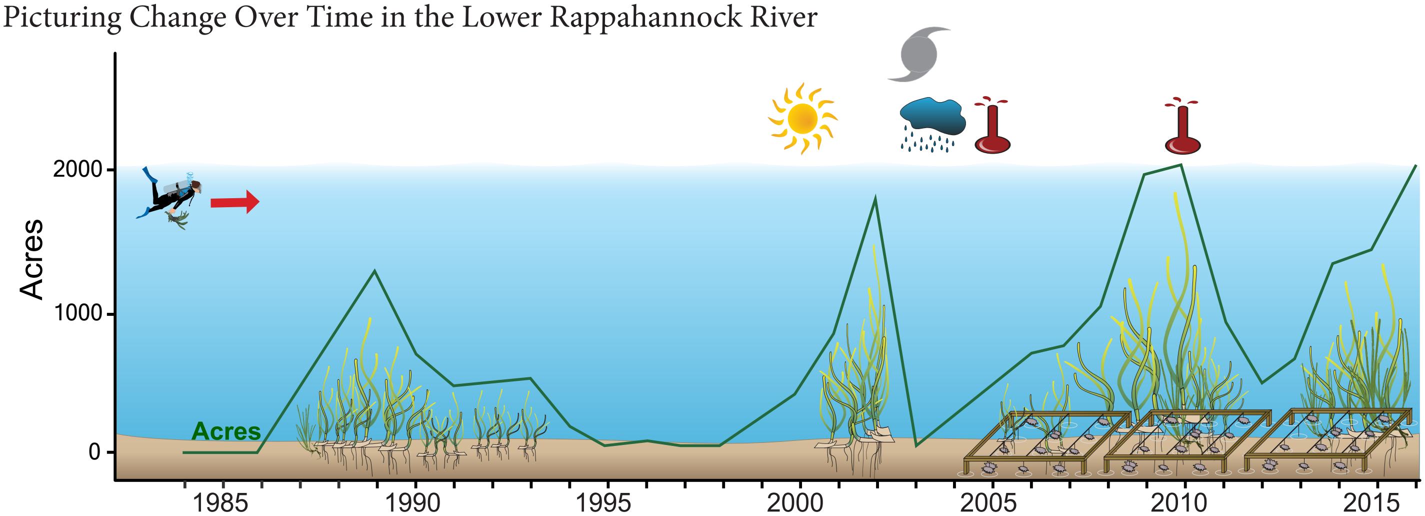
Executive Summary

SAV beds consisting of dense eelgrass and widgeongrass once dominated the shoal areas of the lower Rappahannock and Corrotoman rivers. SAV acreage achieved maximum coverage in the 1960s correlating with the driest period recorded in recent history. In 1972, Tropical Storm Agnes triggered a dramatic decline in SAV in this segment. Little SAV was noted through the 1980s but then went through a series of increases and inexplicable declines over the next few decades, possibly related to water clarity and the dynamics of widgeongrass, which now dominated this segment. The restoration goal of 2,468 acres has yet to be achieved. Efforts to restore eelgrass using both plants and seeds of the same species in the 1980s through 2010 have been unsuccessful. Aquaculture has become an emerging issue in this segment.

SAV Acres and Density



Picturing Change Over Time in the Lower Rappahannock River



Key

- Drought 1998-2002
- Wet Period 2003-2004
- Hurricane Isabel 2003
- Heat Events 2005, 2010
- Oyster Aquaculture
- Transplants 1980s-2010
- Ongoing Event
- Eelgrass
- Widgeongrass

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Take Home Points

Goal - Potentially Attainable

The goal of 2,468 acres has never been achieved. Attainment may be possible with improvements in water quality. The recent expansion of widgeongrass will help attain the goal.

Historical Coverage

Historical and recent distribution well known

Present in the early 1900s, eelgrass has long been the dominant species in this segment. Distribution and abundance were reduced in the 1930s following the Chesapeake Bay-wide eelgrass epidemic, but recovered by the 1960s reaching peak distributions through the late 1960s. More recently, SAV beds have been dominated by widgeongrass, with some eelgrass found in relatively small areas in the lower northern shore of the Rappahannock River.

Key Events

Tropical Storm Agnes

In 1972, Tropical Storm Agnes resulted in the loss and reduction of many eelgrass beds in this segment.

Transplant projects

In the 1980s, large-scale restoration efforts planting adult eelgrass, as well as seeds, were initiated with little long-term success. Smaller-scale efforts planting seeds and adult eelgrass plants were subsequently attempted, again with no success.

Vulnerability/Resilience

Water clarity

Varying periods of rainfall in the 1980s and 1990s influenced water clarity and may have facilitated the changes noted in widgeongrass distribution.

Eelgrass is susceptible to heat events

Eelgrass was rare in this segment after 1972, and despite restoration efforts, remains a very sparse member of the SAV community. If it does occur, the survival of eelgrass will ultimately depend on clearer and cooler water, as it is susceptible to heat events, similar to what occurred in 2005 and 2010. Widgeongrass, which is now the dominant species in this segment, is much more tolerant than eelgrass of temperature extremes, showing recent increases here. However, widgeongrass populations can be highly variable on an annual basis, and may fluctuate more as the Bay becomes increasingly warmer. They also typically require more light for growth than eelgrass and therefore their expansion would likely be most evident in the shallowest nearshore SAV habitats.

Aquaculture

Oyster aquaculture has been rapidly expanding, and could provide a boost to the local economy, helping replace declining wild stocks and lead to water clarity improvements due to biofiltration. However, shellfish aquaculture, which occupies shallow water habitat that is also potential SAV habitat, could limit the recovery of SAV into those regions, if improving water clarity lead to an SAV resurgence.

Management Implications

Nutrient and sediment reductions; aquaculture

Managers will need to focus on improving water clarity by reducing both sediment and nutrients. Managers will be unable to do much about temperature as this is a global issue. However, by improving water clarity, plants may be able to tolerate periods of warmer water. In addition, managers will have to deal with new and existing aquaculture lease requests, where SAV is currently present, as well as in unvegetated areas where SAV once was abundant and may begin recolonizing in the future.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2001, 2004; 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)
http://vecos.vims.edu/ (Virginia water quality data)