

Upper Rappahannock River (RPPTF)

A recent expansion of submerged aquatic vegetation (SAV) has been observed throughout the upper Rappahannock River.

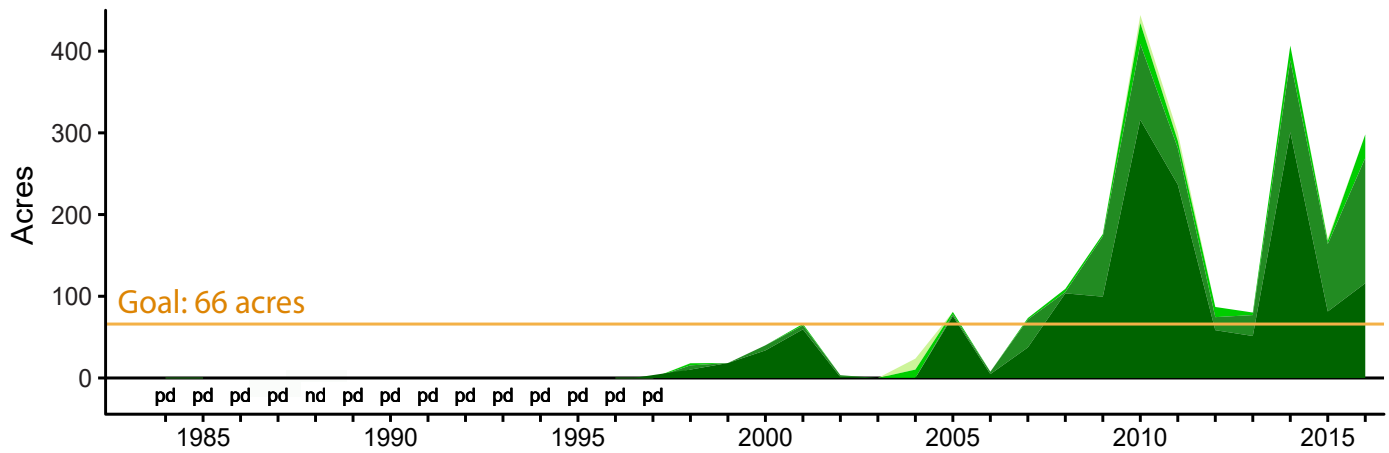


Executive Summary

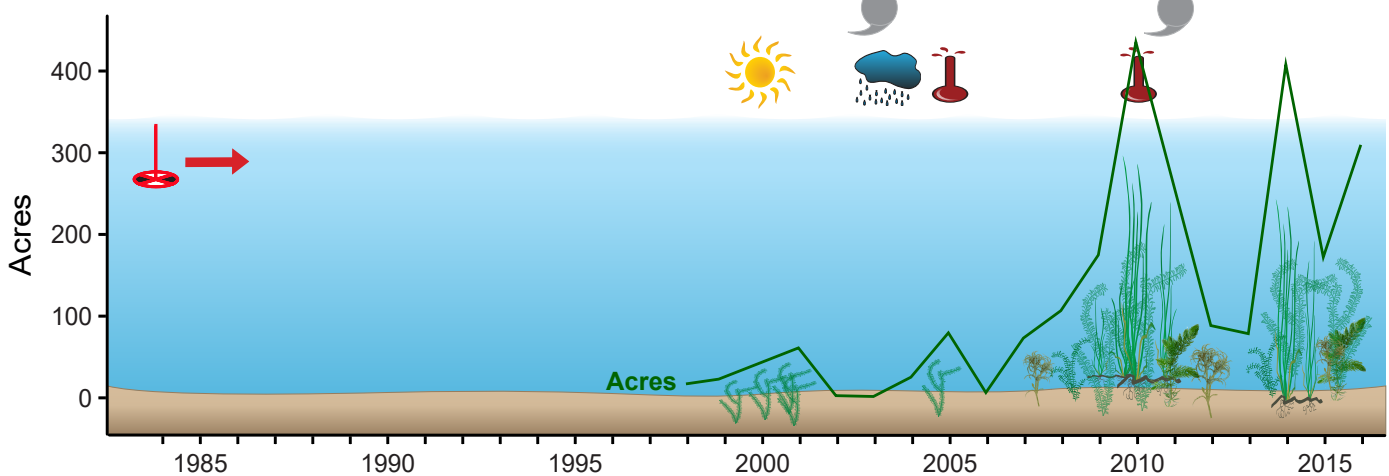
Limited historical SAV data exists for the upper Rappahannock River until 1978 when a ground survey was conducted and found SAV in the tidal wetland areas and in the several small creeks off the mainstem. SAV was also observed in 1998 when the Chesapeake Bay-wide aerial survey expanded to include this upper Rappahannock River segment. Since the onset of the Bay-wide aerial survey here, SAV beds have expanded and contracted depending on water quality conditions. The segment has regularly exceeded its SAV restoration goal of 66 acres, although this goal is likely artificially low due to limited historical coverage data. SAV species found here include hornwort, hydrilla and naiads and they populate the tidal wetland area formed by the meandering river channel, the tributary creeks and the large, shallow shoals found along the main river channel.

SAV Acres and Density

Density ■ 1-10% ■ 10-40% ■ 40-70% ■ 70-100%



Picturing Change Over Time in the Upper Rappahannock River



Key

Drought 1998-2002	Hurricane Isabel 2003	Ongoing Event	Wild Celery
Wet Period 2003-2004	Tropical Storm Lee 2011	Hydrilla	Hornwort
Heat Events 2005, 2010	Poor Water Clarity	Naiads	Common Waterweed

Goal - Attainable

The goal of 66 acres has been regularly achieved and at times dramatically exceeded since 2007. The goal is artificially low due to a lack of historical coverage data.

Historical Coverage

Historical data limited; segment wasn't included in Bay-wide aerial survey until 1998

Historical SAV data for the upper Rappahannock River is limited, but a ground survey conducted in 1978 noted hornwort, wild celery and several species of naiads in the creeks off the mainstem. The Bay-wide aerial survey didn't cover this area of the Rappahannock River until 1998 and at that time, SAV was minimal. Acreage remained low until 2007 when it increased dramatically for the next several years, peaking at 444 acres in 2010. SAV in the upper Rappahannock River is located primarily in the small creeks off the mainstem, within the large tidal swamp and marsh embayments formed by the meandering river, and along the shoals fringing the main river channel. Species observed more recently include hornwort, hydrilla, naiads, common waterweed and wild celery.

Key Events

Hydrilla introduction

Hydrilla was first observed in this segment in 1999 but it never achieved the density and abundance noted in the Potomac, Pamunkey, Mattaponi and Chickahominy rivers.

Tropical Storm Lee and Hurricane Irene

Tropical Storm Lee and Hurricane Irene swept over the Bay and its watershed in late summer, 2011. The freshwater, scour and nutrient and sediment pollution from extensive runoff that resulted from the storms severely impacted SAV in areas throughout the Bay, including the upper Rappahannock River. SAV has recovered in the time since then.

Vulnerability/Resilience

Water clarity; high energy environments

Nutrient and sediment pollution will continue to influence SAV abundance and species composition in the upper Rappahannock River by limiting light availability. High energy environments along the mainstem shorelines will also limit SAV productivity here.

Storms and floods

Areas in the upper portion of the segment where the river channel is narrower and more riverine can be subject to high flows during extreme floods. This results in both erosion and sediment deposition which can affect the SAV beds. SAV found fringing the main channel would be most vulnerable.

Management Implications

Nutrient and sediment reductions

Managers should continue to focus on implementation of best management practices (BMPs) that reduce nonpoint source nutrient and sediment pollution, particularly those that decrease loading during floods and extreme weather events.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2001, 2004; Orth et al. 2010a, 2017; Shields et al. 2012; Patrick and Weller 2015, Lefcheck et al. 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)