

Middle James River (JMROH)

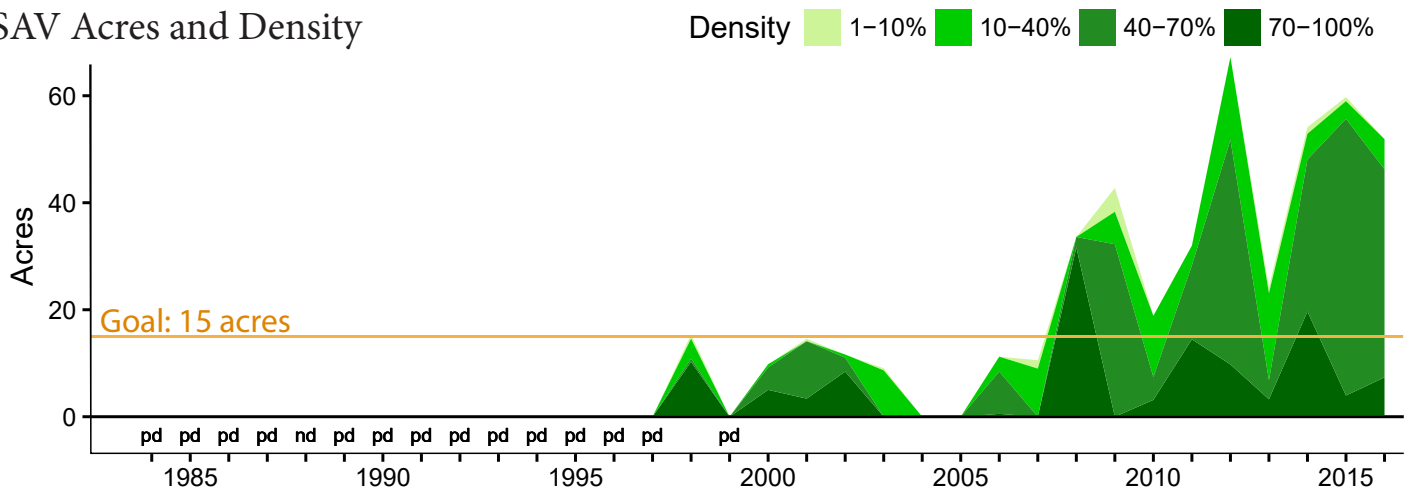
Recent expansion of beds of submerged aquatic vegetation (SAV) dominated by hornwort, naiads and hydrilla has been observed along the shorelines of the several small tributary creeks found in the middle James River.



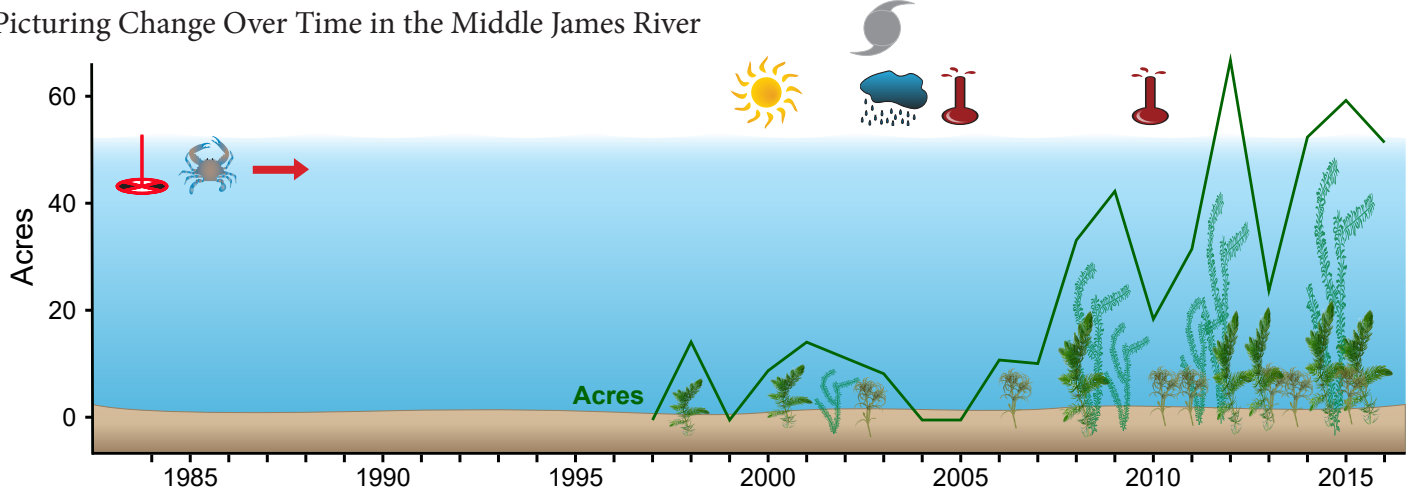
Executive Summary

Review of historical aerial photography from 1937 to 1969 showed no evidence of SAV beds in this segment. Small fringing beds of SAV consisting of hornwort and naiads were first observed in the Chesapeake Bay-wide aerial and ground surveys in 1998 in Gray's Creek and near the mouth of the Chickahominy River. Since that period, SAV consisting of hornwort, naiads and hydrilla have expanded in both Gray's Creek and Powhatan Creek located in the Jamestown Island region of the segment to reach approximately 52 acres by 2016. The segment has regularly exceeded its SAV goal of 15 acres since 2008. The canopy forming species now found here can typically grow to the water's surface and therefore are more resistant to the naturally high turbidities found near the river's zone of turbidity maximum. However, they typically can only grow within the several large tributary creeks found here which provide protection from the high waves and strong currents which characterize the open and expansive mainstem James River shorelines.

SAV Acres and Density



Picturing Change Over Time in the Middle James River



Key

	Drought 1998-2002		Poor Water Clarity		Hornwort
	Wet Period 2003-2004		Herbivory		Naiads
	Hurricane Isabel 2003		Ongoing Event		Hydrilla
	Heat Events 2005, 2010				

Goal - Attainable

The goal of 15 acres has been regularly achieved since 2008.

Historical Coverage

Historical coverage not well known

SAV consisting of hornwort was first observed in Gray's Creek in 1998. There is no historical information on the SAV here. It is possible that small pockets of SAV existed in the many small creeks entering the James River.

Key Events

Expansion of SAV since 1998

Since first observed in 1998 in Gray's Creek, SAV beds have continued to increase in abundance along small protected creek shorelines from 12 to nearly 52 acres in 2016.

Hydrilla introduction

Hydrilla was first observed in the Chickahominy region of the James River in 2000, however the typically higher salinities found in this segment have favored the growth of more salinity tolerant species such as hornwort and naiads.

Vulnerability/Resilience

Salinity

This section of the middle James River area is in an important transition area susceptible to salinity changes which could affect the composition of SAV beds in this segment. Drought conditions would likely favor hornwort and naiads while wet conditions would favor expansion of hydrilla.

Water clarity

Nutrients and suspended sediments will continue to play a dominant role in influencing SAV populations by altering the light conditions. Naturally high turbidities will limit the SAV growth to favor canopy formers in the creeks. High energy environments along the mainstem James River shorelines combined with high turbidities will limit most SAV growth there.

Herbivory

Recent information suggests herbivory, especially by blue crabs, may play an important role in limiting wild celery recruitment along mainstem James River shorelines. SAV species, such as hornwort, naiads and hydrilla, that can spread via fragments may be less affected by herbivory from crabs, birds and other herbivores.

Management Implications

Nutrient and sediment reductions; salinity

Managers should continue to focus on reducing nonpoint source nutrients and sediments to promote SAV growth in creeks and along mainstem shorelines. Water diversion for human consumption in upriver areas may increase salinities causing periodic SAV losses to these principally freshwater species.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 1999, 2000, 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)