

Hudson River Submerged Aquatic Vegetation

What Are SAV Beds?

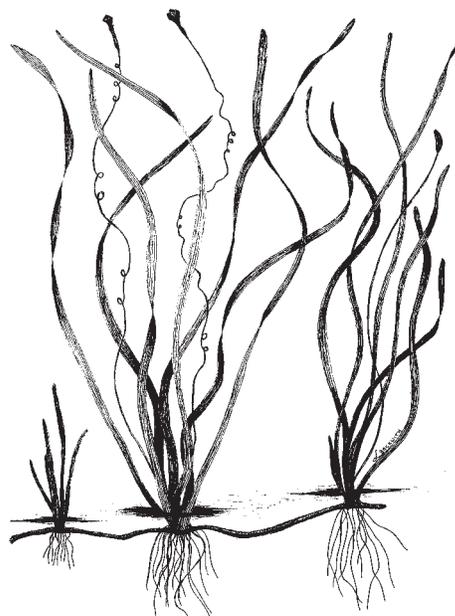
Submerged Aquatic Vegetation (SAV) refers to plants capable of growing underwater, so they are almost invisible to the casual observer. These plants are very important parts of lakes, rivers and the oceans, providing oxygen to the water and food and hiding places for small animals. In the Hudson River, SAV can occur in water up to six feet deep at low tide and may cover as much as one-quarter of the river bottom.

Common Species

Hudson River SAV includes the native plant water celery (*Vallisneria americana*), claspingleaved pondweed (*Potamogeton perfoliatus*), and such non-native plants as curly pondweed (*Potamogeton crispus*) and Eurasian water milfoil (*Myriophyllum spicatum*). The invasive water chestnut (*Trapa natans*) has much of its rosette of leaves above the water surface and so is not strictly-speaking submerged vegetation, but occurs adjacent to and intermingled with true SAV species.

Abundance

SAV occupies about 8 percent of the total river. Abundance of SAV varies dramatically among different reaches of the Hudson River, with maximum coverage of approximately 20 percent of the river area between Kingston and Catskill. Occurrence of plants is light-limited with the highest abundances in water less than three feet deep at low tide. Water celery is by far the most common species. Water chestnut is a conspicuous plant but does not occupy nearly as large an area as SAV. The extent of both SAV and water chestnut can change dramatically over time for reasons we do not yet fully understand. Because of their critical contributions to estuary health, it is important to protect historical SAV habitat. Even if SAV beds disappear, these areas should continue to receive protection as areas of SAV regrowth.



Water
celery

Illustration by Linda Beckwith McCloskey



NYS Department
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Ecology

The ecological functions of SAV beds are diverse. They act as nurseries for many larval and juvenile fish including alewife, banded killifish, white perch and carp and produce organic matter that is an integral part of the Hudson River food web. The submersed plants take in nutrients through their roots and leaves, thus reducing the likelihood of algal blooms. During calm periods they can filter suspended sediments leading to increased water clarity. SAV communities also provide important habitat and feeding areas for waterfowl. A number of diving ducks rely on the Hudson SAV beds. The canvasback (*Aythya valisineria*) eats more plants than other waterfowl and, as suggested by the duck's scientific name, water celery is a favorite food. Bufflehead, common goldeneye, merganser and scaup feed on plants, fish and invertebrates in the vegetated shallows. Wading birds such as the snowy egret and the great blue heron have been frequently observed feeding in SAV at low tide.

The Hudson River SAV Project

The Hudson River SAV project began in 1993 with the goal of assembling good information on abundance, distribution, change over time and ecological functions of SAV. Initially beds were mapped using true color aerial photographs. Determining bed location and extent was a valuable and important first step and SAV maps are presently available for the Hastings to Troy section of the Hudson River. Subsequent research documented how SAV leads to improved water quality and exactly which fishes (such as the pumpkinseed shown) and invertebrates use these plant beds as habitat. For the past six years a dedicated group of volunteers has collected data on particular sites to fill in the time points between aerial photography flights and provide more detailed information such as species composition and water depth. Information from the project is used by NYSDEC in consideration of permit applications and has been used to develop lesson plans for students. The project has always been a strong collaboration among several partners with the majority of funding from the NYSDEC, Hudson River Estuary Program, along with the Hudson River Foundation and National Science Foundation.



Pumpkinseed
(*Lepomis gibbosus*) inhabits SAV.
Archival painting, Ellen Edmonson,
courtesy NYS Museum/NYSDEC.

For More Information

Findlay, S., D. Strayer, M. Bain, W.C. Nieder, 2006. *Ecology of Hudson River Submerged Aquatic Vegetation*, Report to NYS Department of Environmental Conservation, 99 pp.
(Download at http://hrnerr.org/public/SAV/Findlay_et_al_2006.pdf 1.5 MB pdf)

About Hudson River SAV Ecology:
Hudson River National Estuarine Research Reserve
www.dec.ny.gov/lands/4915.html
www.hrnerr.org

About SAV Remote Sensing and Mapping:
Cornell Institute for Resource Information Sciences
www.css.cornell.edu/iris

SAV Education for Recreational Boaters:
New York Sea Grant
www.nyseagrant.org

Cary Institute of Ecosystem Studies:
www.caryinstitute.org

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