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ABSTRACT

The U.S. Geological Survey determined submersed aquatic vegetation distribution and abundance in the tidal Potomac River and upper Potomac Estuary annually from 1993-1998. Observations were made on the location and abundance of submersed aquatic vegetation and the relative coverage of species present at the end of the growing season. The survey area extended from Chain Bridge in Washington, D.C. to Maryland Point, or as far downstream as the Route 301 Bridge depending on annual research needs. A set of 1:24,000-scale maps was created in the field and laboratory using aerial photographs and shoreline survey data collected over a period of several weeks. A set of smaller scale maps was also created to summarize the distribution and abundance of submersed aquatic vegetation and Hydrilla verticillata in the tidal Potomac River and upper Potomac Estuary.

INTRODUCTION

Submersed aquatic vegetation (SAV) is an important part of the food web in the Chesapeake Bay, providing shelter and nursery grounds for shellfish and finfish of commercial importance, as well as food for a diversity of waterfowl. SAV disappeared from the freshwater tidal Potomac River in the late 1930’s (Carter and others, 1985). In the early 1980’s, as water quality improved, many species of SAV returned (Carter and Rybicki, 1986, Rybicki and others, 1985). A southeast Asian species, Hydrilla verticillata, invaded the tidal Potomac River with the return of SAV, and populations of this exotic species increased dramatically in the mid to late 1980’s. H. verticillata can be very dense in shallow areas, where it interferes with boat traffic, and the U.S. Army Corps of Engineers (COE), local, and state agencies began a harvesting program in the mid 1980’s to provide boaters with access through the H. verticillata beds to boat moorings and marinas.

U.S. Geological Survey (USGS) researchers monitored the distribution and abundance as well as species composition of submersed aquatic vegetation (SAV) in the tidal Potomac River and Estuary beginning in 1978 (Carter and others 1985; Rybicki and others 1986; 1987). The USGS documented changes in SAV after the resurgence in SAV and provided information to many agencies, including the COE’s Aquatic Plant Management Program. A series of 1:24,000-
scale field data maps and small-scale summary maps of SAV field survey results were produced annually.

This report summarizes the observations on SAV distribution and abundance, including *Hydrilla verticillata*, for the period 1993-1998. These data are used by the Potomac Aquatic Plant Control Program for the Metropolitan Washington Council of Governments, the D. C. Department of Consumer and Regulatory Affairs: Fisheries Division, the Virginia Institute of Marine Science (VIMS), the COE, and the Chesapeake Bay Program to study SAV ecosystem dynamics and to meet local and regional aquatic plant management needs. Annual SAV coverage (in hectares) as well as species present in the survey area are available on the Internet from VIMS (Orth and others, 1993-98; http://www.vims.edu/bio/sav).

**MAPPING METHODS**

The distribution and abundance of SAV, including *H. verticillata*, were determined by shoreline survey from a shallow draft boat and the use of aerial photographs. The shoreline survey was conducted annually at the end of the growing season--late August through early October. The northern extent of the survey area was at Chain Bridge in the Potomac and near Kingman Island in the Anacostia River. The southern end of the survey area was between Aquia Creek and the Route 301 Bridge, with the extent depending on specific annual research needs. The area surveyed included all navigable tidal tributaries in the reach. Field observations on the location, percent cover of vegetation, and percent of each species in each bed encountered were made within two hours of low tide and were recorded on 1:24,000-scale maps (unpublished data). A metal rake was used to scrape along the bottom to check for the presence of species not visible from the surface and to confirm that plants were rooted and not simply floating (Rybicki and others, 1987). Aerial photographs (1:12,000 and 1:24,000 scale) were obtained annually and were used in the field and in the lab to assist in the delineation of SAV bed boundaries and determination of plant density. A set of smaller scale maps (Figures 1-33) were then created from the 1:24,000-scale maps to illustrate the overall SAV and *H. verticillata* distribution and abundance. These smaller scale maps are theme products, and SAV coverages are not exactly to scale.

**ACKNOWLEDGMENTS**

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EXPLANATION
Percent cover of Hydrilla verticillata in areas of submersed aquatic vegetation-1996

- 70 - 100
- 40 - 70
- 10 - 40
- 0 - 10

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EXPLANATION
Percent cover of submersed aquatic vegetation-1997
- 70 - 100
- 40 - 70
- 10 - 40
- 1 - 10
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**EXPLANATION**

Percent cover of *Hydrilla verticillata* in areas of submersed aquatic vegetation-1998

- **No Data**
- **0 - 10**
- **10 - 40**
- **40 - 70**
- **70 - 100**

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EXPLANATION
Percent cover of submersed aquatic vegetation-1998

- 70 - 100
- 40 - 70
- 10 - 40
- 1 - 10
- No Data