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Spotsylvania and Caroline County Tidal Marsh Inventory Including City of Fredericksburg

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SPOTSYLVANIA AND CAROLINE COUNTY TIDAL MARSH INVENTORY
INCLUDING CITY OF FREDERICKSBURG
SPECIAL REPORT NO. 167 IN APPLIED MARINE SCIENCE AND OCEAN ENGINEERING

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APRIL 1979
ACKNOWLEDGEMENTS

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The authors wish to express their sincerest gratitude to Dr. Gene M. Silberhorn, project leader, Col. George Dawes, Mr. Damon Doumlele and Mr. Kenneth Moore for their constructive review of this report. Also, a special thanks to Mr. Doumlele for his valuable assistance in the field.

For assistance in the preparation of this report, we are indebted to Mr. Edward Briley for map illustrations and Mr. Kenneth Thornberry for photographic work.

Sincere thanks to Mrs. Carole Knox and Ms. Nancy Hudgins for typing the various drafts and the final manuscript.

Finally, the authors express their thanks to Mr. W. T. Hicks, Jr. of Rappahannock Academy, Virginia for the valuable use of his boat ramp for the duration of the field work.
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INTRODUCTION

This publication is the eighteenth in a series of marsh inventory reports compiled by the Department of Wetlands Research, Virginia Institute of Marine Science. The seventeen previous reports that have been published are:

- Lancaster County
- Northumberland County
- Mathews County
- York County and the Town of Poquoson
- Stafford County
- Prince William County
- King George County
- City of Hampton
- Fairfax County
- Gloucester County
- City of Virginia Beach
  Vol. 1 & 2
- City of Newport News and Fort Eustis
- Accomack County
- Northampton County
- Westmoreland County
- James City County
  and the City of Williamsburg
- Surry County

This report is presented in much the same format as the preceding reports.

Under section 62.1-13.4 of the Virginia Wetlands Act, the Virginia Institute of Marine Science is obligated to inventory the tidal wetlands of the Commonwealth. The inventory program is designed to assist wetlands boards, cities, counties, planning districts and other local state and federal agencies as well as the general public and private industry.

A previously published study, Guidelines for Activities Affecting Virginia Wetlands, Silberhorn, Dawes and Barnard, 1974, VIMS SRAMSOE No. 46, will be helpful in the utilization of this report. Excerpts from the above document are included in the following text, explaining marsh vegetation types and their evaluation. The reader is also referred to Tidal Wetlands Plants of Virginia, Silberhorn, 1976, VIMS Educational Series No. 19, a recently published manual describing each of the wetland plants listed in the Act. Both of the documents are available from the library.

It is our desire that this inventory report and the marsh guidelines study will be useful to those concerned with conserving this valuable resource.
The wetlands found along the shoreline of the City of Fredericksburg, Spotsylvania County and Caroline County total 492.52 acres. Of this number, 0.26 acres occur in the City of Fredericksburg, 7.26 acres occur in Spotsylvania County and 485.00 acres occur in Caroline County, which contains 98% of the total marsh acreage of this inventory.

The vast majority of the marshes described in this report is of the Freshwater Mixed Community Type (Type XI). The Freshwater Mixed Communities of the upper reaches of the Rappahannock River contain such species as Yellow Pond Lily, Tearthumb and Arrow Arum. However, the abundance of any particular species in this community may fluctuate during the growing season.

This inventory report is arranged into three sections, each describing a significant length of shoreline. Section I describes the City of Fredericksburg with Sections II and III describing Spotsylvania County and Caroline County, respectively.

The sections of shoreline described in this report remain, for the most part, undisturbed. Two factors could possibly account for this. First, since the upper reaches of the Rappahannock River are fresh, crabs and shellfish are absent. Because of this, much of the commercial activity associated with the lower section of the river is absent here. Secondly, much of this shoreline is characterized by steep banks and cliffs of up to 150 feet in elevation; thus, the amount of beach available for development is limited.
For a better understanding of Virginia's Wetlands the following publications are recommended:

Coastal Wetlands of Virginia
Interim Report No. 3
Guidelines for Activities Affecting Virginia's Wetlands
Special Report in Applied Marine Science and Ocean Engineering No. 46
Gene M. Silberhorn, George M. Dawes, Thomas A. Barnard, Jr., June 1974
Virginia Institute of Marine Science Gloucester Point, Virginia 23062

Local Management of Wetlands
Environmental Considerations
Special Report in Applied Marine Science and Ocean Engineering No. 35
Kenneth Marcellus, George M. Dawes, Gene Silberhorn, June 1973
Virginia Institute of Marine Science Gloucester Point, Virginia 23062

Coastal Wetlands of Virginia
Interim Report No. 2
Special Report in Applied Marine Science and Ocean Engineering No. 27
Kenneth Marcellus, July 1972
Virginia Institute of Marine Science Gloucester Point, Virginia 23062
Coastal Wetlands of Virginia Interim Report
Special Report in Applied Marine Science and Ocean Engineering No. 10
Marvin Wass and Thomas Wright, December 1969
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062

Laws of Virginia Relating to Wetlands and Subaqueous Waters
Virginia Marine Resources Commission
2401 West Avenue
Newport News, Virginia 23607

Wetlands Guidelines
Virginia Marine Resources Commission
2401 West Avenue
Newport News, Virginia 23607

Tidal Wetlands Plants of Virginia
Educational Series No. 19
Gene M. Silberhorn, illustrated by Mary Warinner, August 1976
Virginia Institute of Marine Science
Gloucester Point, Virginia 23607

Wetlands Plants of the Eastern United States
North Atlantic Division Publication No. 220-1-1
Robert J. Pierce, February 1977
North Atlantic Division, United States Army Corps of Engineers
New York, N.Y. 10007
METHODS

Topographic maps (U.S.G.S.) were utilized to obtain major wetlands boundaries and locations. These wetlands contain various community zones and vegetative patterns, which were investigated on foot as well as by boat. Visual estimates were used in delineating boundaries and plant species percentage.

Marshes 0.25 acres or larger are designated by number. Many marshes smaller than 0.25 acres (usually narrow fringing marshes) are designated by the same symbol (shaded) as the larger marshes on the section maps. Smaller marshes (less than 1.0 acre) are exaggerated and are not indicated to scale. Information such as individual marsh acreage, marsh type and other observations are recorded in tabular form. Plant community percentages are recorded to the nearest percent, and acreages to the nearest 0.01 acre. In those instances where an individual plant species is estimated to amount to less than 0.5 percent or 0.05 acre, the symbol (-) is used to indicate a trace amount. In certain situations where an individual marsh is estimated to contain 50 percent or more of a species that is not listed as a marsh type, the closest applicable marsh type is used. For example, a marsh which is judged to contain 60 percent Wild Rice would be listed as Type XI (Freshwater Mixed Community).
Marsh Types and Evaluation

For a better understanding of what is meant by marsh types, some background information is required. The personnel of the Department of Wetlands Ecology and Environmental Impact Assessment have classified twelve different common marsh types in Virginia, based on vegetational composition. These marsh types have been evaluated according to certain values and are recorded in the Guidelines report. The following is a brief outline of the wetland types and their evaluation as found in that publication:

"It is recognized that most wetlands areas, with the exception of the relatively monospecific cordgrass marshes of the Eastern Shore, are not homogeneously vegetated. Most marshes are, however, dominated by a major plant. By providing the manager with the primary values of each community type and the means of identification, he then has a useful and convenient tool for weighing the relative importance of each marsh parcel. In Virginia, many wetlands management problems involve only a few acres or a fraction of an acre. The identification of plant communities permits the manager to evaluate both complete marshes and subareas within a marsh.

"Each marsh type may be evaluated in accordance with five general values. These are:

"1. Production and detritus availability. Previous VIMS reports have discussed the details of marsh production and the role of detritus which results when the plant material is washed into the water column. The term "detritus" refers to plant material which decays in the aquatic system and forms the basis of a major marine food web. The term "production" refers to the amount of plant material which is produced by the various types of marsh plants. Vegetative production of the major species has been measured and marshes have been rated in accordance with their average levels of productivity. If the production is readily available to the marine food web as detritus, a wetlands system is even more important than one of equal productivity where little detritus results. Availability of detritus is generally a function of marsh elevation and total flushing, with detritus more available to the aquatic environment in the lower, well-flushed marshes."
"2. Waterfowl and wildlife utilization. Long before marshes were discovered to be detritus producers, they were known as habitats for various mammals and marsh birds and as food sources for migratory waterfowl. Some marsh types, especially mixed freshwater marshes, are more valuable because of diversity of the vegetation found there.

"3. Erosion buffer. Erosion is a common coastal problem. Marshes can be eroded, but some, particularly the more saline types, are eroded much more slowly than adjacent shores which are unprotected by marsh. This buffering quality is derived from the ability of the vegetation to absorb or dissipate wave energy by establishing a dense root system which stabilizes the substrate. Generally, freshwater species are less effective than saltwater plants in this regard.

"4. Water quality control. The dense growth of some marshes acts as a filter, trapping upland sediment before it reaches waterways and thus protecting shellfish beds and navigation channels from siltation. Marshes can also filter out sediments that are already in the water column. The ability of marshes to filter sediments and maintain water clarity is of particular importance to the maintenance of clam and oyster production. Excessive sedimentation can reduce the basic food supply of shellfish through reduction of the photic zone where algae grow. It can also kill shellfish by clogging their gills. Additionally, marshes can assimilate and degrade pollutants through complex chemical processes, a discussion of which is beyond the scope of this paper...

"5. Flood buffer. The peat substratum of some marshes acts as a giant sponge in receiving and releasing water. This characteristic is an effective buffer against coastal flooding, the effectiveness of which is a function of marsh type and size.
"Research and marsh inventory work accomplished by VIMS personnel indicate that 10 species of marsh vegetation tend to dominate many marshes, the dominant plant depending on water salinity, marsh elevation, soil type and other factors. The term "dominant" is construed to mean that at least 50% of the vegetated surface of a marsh is covered by a single species. Brackish and freshwater marshes often have no clearly dominant species of vegetation. These marshes are considered to be highly valuable in environmental terms."

Marsh Types and Their Environmental Contributions

(Edited from Guidelines for Activities Affecting Virginia Wetlands)

Type I Saltmarsh Cordgrass Community

a. Average yield 4 tons per acre per annum. (Optimum growth up to 10 tons per acre).
b. Optimum availability of detritus to the marine environment.
c. Roots and rhizomes eaten by waterfowl and stems used in muskrat lodge construction. Also serves as nesting material for various birds.
d. Deterrent to shoreline erosion.
e. Serves as sediment trap and assimilates flood waters.

Type II Saltmeadow Community

a. 1-3 tons per acre per annum.
b. Food (seeds) and nesting areas for birds.
c. Effective erosion deterrent.
d. Assimilates flood waters.
e. Filters sediments and waste material.
Type III Black Needlerush Community

a. 3-5 tons per acre per annum
b. Highly resistant to erosion.
c. Traps suspended sediments but not as effective as Type II.
d. Somewhat effective in absorbing flood waters.

Type IV Saltbush Community

a. 2 tons per acre per annum or less.
b. Nesting area for small birds and habitat for a variety of wildlife.
c. Effective trap for flotsam.

Type V Big Cordgrass Community

a. 3-6 tons per acre per annum.
b. Detritus less available than from Type I.
c. Habitat for small animals and used for muskrat lodges.
d. Effective erosion buffer.
e. Flood water assimilation.

Type VI Cattail Community

a. 2-4 tons per acre per annum.
b. Habitat for birds and utilized by muskrats.
c. Traps upland sediments.

Type VII Arrow Arum-Pickerelweed Community

a. 2-4 tons per acre per annum.
b. Detritus readily available to marine environment.
c. Seeds eaten by wood ducks.
d. Susceptible to erosion from wave action and boat wakes, particularly in winter months.
Type VIII  Reed Grass Community

a. 4-6 tons per acre per annum.
b. Little value to wildlife except for cover.
c. Invades marshes and competes with more desirable species.
d. Deters erosion on disturbed sites.

Type IX  Yellow Pond Lily Community

a. Less than 1 ton per acre per annum.
b. Cover and attachment site for aquatic animals and algae.
c. Feeding territory for fish.

Type X  Saltwort Community

a. Less than 0.5 tons per acre per annum.
b. Little value to aquatic or marsh animals.

Type XI  Freshwater Mixed Community

a. 3-5 tons per acre per annum.
b. High diversity of wildlife.
c. High diversity of wildlife foods.
d. Often associated with fish spawning and nursery grounds.
e. Ranks high as a sediment trap and nursery grounds.

Type XII  Brackish Water Mixed Community

a. 3-4 tons per acre per annum.
b. Wide variety of wildlife foods and habitat.
c. Deterrent to shoreline erosion.
d. Serves as sediment trap and assimilates flood waters.
e. Known spawning and nursery grounds for fish.
Evaluation of Wetland Types

(From Guidelines for Activities Affecting Virginia Wetlands)

For management purposes, the twelve types of wetlands identified above are grouped into five classifications based on the estimated total environmental value of an acre of each type.

**Group One:**
- Saltmarsh Cordgrass (Type I)
- Arrow Arum-Pickerelweed (Type VII)
- Freshwater Mixed (Type XI)
- Brackish Water Mixed (Type XII)

Group One marshes have the highest values in productivity, wildfowl and wildlife utility and are closely associated with fish spawning and nursery areas. They also have high value as erosion inhibitors, are important to the shellfish industry and valued as natural shoreline stabilizers. Group One marshes should be preserved.

**Group Two:**
- Big Cordgrass (Type V)
- Saltmeadow (Type II)
- Cattail (Type VI)

Group Two marshes are of only slightly lesser value than Group One marshes. The major difference is that detritus produced in these marshes is less readily available to the marine environment due to higher elevations and consequently less tidal action to flush the detritus into adjacent waterways. Group Two marshes have very high values in protecting water quality and acting as buffers against coastal flooding. These marshes should also be preserved, but if development in wetlands is considered to be justified it would be better to alter Group Two marshes than Group One marshes.
The two marshes in the Group Three category are quite dissimilar in properties. The yellow pond lily marsh is not a significant contributor to the food web but it does have high values to wildlife and waterfowl. Black needlerush has little wildlife value but it ranks high as an erosion flood buffer. Group Three marshes are important though their total values are less than Group One and Two marshes. If development in wetlands is considered necessary, it would be better to alter Group Three marshes than Groups One or Two.

Group Four: Saltbush (Type IV)

The saltbush community is valued primarily for the diversity and bird nesting area it adds to the marsh ecosystem. To a lesser extent it acts as an erosion buffer. Group Four marshes should not be unnecessarily disturbed but it would be better to concentrate necessary development in these marshes rather than disturb any of the marshes in the preceding groups.

Group Five: Saltwort (Type X) Reedgrass (Type VIII)

Based on present information Group Five marshes have few values of any significance. While Group Five marshes should not be unreasonably disturbed, it is preferable to develop in these marshes than in any other types.
### Plant List

**Common Names and Scientific Names as Found in the Data Tables**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>*American Lotus</td>
<td>*Nelumbo lutea (Willd.) Pers.</td>
</tr>
<tr>
<td>Arrow Arum</td>
<td>*Peltandra virginica (L.) Kunth</td>
</tr>
<tr>
<td>Arrow Head</td>
<td>*Sagittaria latifolia Willd.</td>
</tr>
<tr>
<td>*Aster</td>
<td>*Aster spp.</td>
</tr>
<tr>
<td>Beggar's Ticks</td>
<td>*Bidens spp.</td>
</tr>
<tr>
<td>*Bull Tongue</td>
<td>*Sagittaria falcata Pursh</td>
</tr>
<tr>
<td>Bulrush</td>
<td>*Scirpus fluviatilis (Torr.) Gray</td>
</tr>
<tr>
<td>River</td>
<td>*Scirpus validus Vahl</td>
</tr>
<tr>
<td>Soft Stem</td>
<td>*Cephalanthus occidentalis L.</td>
</tr>
<tr>
<td>Button Bush</td>
<td>*Lobelia cardinalis L.</td>
</tr>
<tr>
<td>*Cardinal Flower</td>
<td></td>
</tr>
<tr>
<td>Cattail</td>
<td>*Typha latifolia L.</td>
</tr>
<tr>
<td>Common Narrow-leaved</td>
<td>*Typha angustifolia L.</td>
</tr>
<tr>
<td>Common Threesquare</td>
<td>*Scirpus americanus Pers.</td>
</tr>
<tr>
<td>*Day Flower</td>
<td>*Commelina spp.</td>
</tr>
<tr>
<td>*False Nettle</td>
<td>*Boehmeria cylindrica (L.) Sw.</td>
</tr>
<tr>
<td>*Gerardia</td>
<td>*Agalinis purpurea (L.) Penn.</td>
</tr>
<tr>
<td>*Iron Weed</td>
<td>*Vernonia noveboracensis (L.) Michx.</td>
</tr>
</tbody>
</table>

*Marsh species not included in the Virginia Wetlands Act of 1972*
Plant List (continued)

*Jewelweed
*Marsh Eryngo
Marsh Hibiscus
Pickerelweed
*Primrose Willow
Rice Cutgrass
*Sensitive Fern
Smartweed
*Sneeze Weed
*Soft Rush
Spike Rush
*St. John's-wort
*Swamp Milkweed
*Swamp Rose
Sweetflag
*Tearthumb
*Thoroughwort
*Turk's Cap Lily
*Umbrella Sedge

Impatiens capensis Meerb.
Eryngium aquaticum L.
Hibiscus moscheutos L.
Pontederia cordata L.
Ludwigia decurrens Walt.
Leersia oryzoides (L.) Sw.
Onoclea sensibilis L.
Polygonum spp.
Helenium autumnale L.
Juncus effusus L.
Eleocharis spp.
Hypericum mutilum L.
Asclepias incarnata L.
Rosa palustris Marsh.
Acorus calamus L.
Polygonum arifolium L.
Polygonum sagittatum L.
Eupatorium spp.
Lilium superbum L.
Cyperus strigosus L.

*Marsh species not included in the Virginia Wetlands Act of 1972
<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walter's Millet</td>
<td>Echinochloa walteri (Pursh) Nash</td>
</tr>
<tr>
<td>Water Hemp</td>
<td>Amaranthus cannabinus (L.) J. D. Sauer</td>
</tr>
<tr>
<td>Water Hemlock</td>
<td>Cicuta maculata L.</td>
</tr>
<tr>
<td>Water Willow</td>
<td>Justicia americana (L.) Vahl</td>
</tr>
<tr>
<td>Wild Rice</td>
<td>Zizania aquatica L.</td>
</tr>
<tr>
<td>Wood Reedgrass</td>
<td>Cinna arundinacea L.</td>
</tr>
<tr>
<td>Woolgrass</td>
<td>Scirpus cyperinus (L.) Kunth</td>
</tr>
<tr>
<td>Yellow Pond Lily</td>
<td>Nuphar luteum (L.) Sibth. &amp; Sm.</td>
</tr>
</tbody>
</table>

*Marsh species not included in the Virginia Wetlands Act of 1972*
Glossary of Descriptive Terms

cove marsh

A marsh contained within a concavity or recessed area on a shoreline; the marsh vegetation is usually found surrounding a central, open-water pond, and tidal flushing is permitted through an inlet.

creek or embayed marsh

A marsh occupying a drowned creek valley; in many large creek marshes the salinity decreases headward; this type of marsh may be divided for inventory purposes into sections if significant changes in the plant community occur along its length.

delta marsh

A marsh found growing on sediment deposited at the mouth of a tidal creek; tidal exchange through the creek mouth is usually restricted to narrow channels by the marsh.
Glossary of Descriptive Terms

extensive marsh  
a large marsh where the length and depth or width are roughly comparable; most extensive marshes are drained by many tidal channels and creeks which have little freshwater input.

fringe marsh  
a marsh which borders along a section of shoreline and generally has a much greater length than width or depth.

high marsh  
the marsh surface is at an elevation of mean high water or above; it is usually inundated less than twice daily by tidal action.

low marsh  
the marsh surface is at an elevation below mean high water; it is usually inundated twice daily by tidal action.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>marsh island</td>
<td>an isolated marsh surrounded on all sides by open water; interior portions of the marsh may contain trees scattered at highest elevations.</td>
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<tr>
<td>pocket marsh</td>
<td>a marsh contained within a small, essentially semi-circular area on a shoreline.</td>
</tr>
<tr>
<td>point or spit marsh</td>
<td>a marsh which extends from the uplands in the form of a point or spit; its development is usually influenced by tidal currents that form a sand berm behind which the marsh forms.</td>
</tr>
</tbody>
</table>
The City of Fredericksburg is situated on the uppermost tidal reaches of the Rappahannock River. Here, just below the Route 1 bridge, tidal influence ceases. Although the city possesses much tidal shoreline, marsh vegetation is scarce. Only a .25-acre fringing marsh is recorded for the area. It is dominated by Saltweed (Polygonum punctatum) with Walter's Millet (Echinochloa walteri) scattered throughout. A marsh such as this is known as a Freshwater Mixed Community (Type XI), usually of high importance as a spawning and nursery area for fishes and as a food source for waterfowl. However, the shoreline of this section has been greatly affected by commercial, industrial and recreational activity that limits (taking in account the general size of the marsh as well) the importance of this marsh.
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<tbody>
<tr>
<td>Upper Rappahannock River</td>
<td>0.26 acres</td>
<td>%</td>
<td>30</td>
<td>70</td>
<td>0.08</td>
<td>0.18</td>
<td>Fringe marsh 500 feet long dominated by Smartweed with Walter's Millet scattered throughout.</td>
<td></td>
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</tr>
<tr>
<td>Total Section I</td>
<td>0.26 acres</td>
<td>%</td>
<td>30</td>
<td>70</td>
<td>0.08</td>
<td>0.18</td>
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**MARSH TYPE**

<table>
<thead>
<tr>
<th>a = American Lotus</th>
<th>e = Common Three square</th>
<th>f = Day Flower</th>
<th>g = False Nettle</th>
<th>h = Gerardia</th>
<th>i = Ironweed</th>
<th>j = Marsh Eryngo</th>
<th>k = Primrose Willow</th>
<th>m = Sneeze weed</th>
<th>n = Soft Rush</th>
<th>o = Swamp Rose</th>
<th>p = Thoroughwort</th>
<th>q = Turk's Cap Lily</th>
<th>r = Umbrella Sedge</th>
<th>s = Water Willow</th>
</tr>
</thead>
</table>
Section II

Spotsylvania County - Deep Run to Snow Creek

This section covers the 7 miles of shoreline found on Spotsylvania County. But only two marshes are found here, a creek marsh and fringe marsh totaling 7.26 acres. The marshes in this section are classified as Freshwater Mixed Communities (Type XI) and are dominated by Jewelweed (Impatiens capensis) and Tearthumb (Polygonum arifolium and/or Polygonum sagittatum) with small amounts of Rice Cutgrass (Leersia oryzoides), Swamp Milkweed (Asclepias incarnata), Water Hemp (Amaranthus cannabinus) and Walter's Millet (Echinochloa walteri) intermixed.

Development along the shoreline of Spotsylvania County has generally been limited. Two major shoreline activities are recorded, gravel mining and the damming of Massaponax Creek.
SECTION II A. SPOTSYLVANIA COUNTY-DEEP RUN AND RAPPAHANNOCK RIVER
SECTION II B. SPOTSYLVA-NIA COUNTY-RAPPHA-NOCK RIVER AND SNOW CREEK
### Section II. Spotsylvania County - Deep Run to Snow Creek

| #  | MARSH LOCATION  | TOTAL ACRES | Yellow Pond Lily | Tearthumb | Jewelweed | Wild Rice | Rice Cutgrass | Bogger’s Ticks | Arrow Arum | Water Smartweed | Cat tail | Water Hemp | Marsh Hibiscus | Sweetflag | Arrowhead | Swamp Milkweed | Wood Reedgrass | Spike Rush | Water Hemlock - Water Parrot | Burrush | Button Bush | St. John’s Wort | Woolgrass | OTHER | OBSERVATIONS                        |
|----|-----------------|--------------|------------------|------------|-----------|-----------|---------------|----------------|-------------|----------------|----------|-------------|----------------|-----------|-----------|---------------|----------------|-----------|-----------------------------|---------|-------------|----------------|-----------|
| 2  | Off Ruffins Pond | 7.00         |                  |            |           |           |               |                |             |                |          |             |               |           |           |               |                |          | Creek marsh dominated by Jewelweed. Marsh dike at upper end forming Ruffins Pond. |
|    |                  |              | %                | 25         | 40        | 10        | 5             | 10             | -5          | 5              | -         | -           | -              | -         | -         | -              | -               | -         | d                           |
|    |                  |              | acres            | 1.75       | 2.80      | 0.70      | 0.35          | 0.70           | 0.35        | 0.35          | -         | -           | -              | -         | -         | -              | -               | -         | d                           |
| 3  | Rappahannock River | 0.26       | %                | 100        |          | -         | -             |                |             |                | -         | -           | -              |           |           | -              | -               | -         | Fringe marsh 1600 feet long containing 100% Jewelweed. |
|    |                  |              | acres            | 0.26       |          | -         | -             |                |             |                | -         | -           | -              |           |           | -              | -               | -         | d                           |
|    | Total Section II | 7.26         | %                | 24         | 41        | 10        | 5             | 10             | 5           | 5              | -         | -           | -              |           |           | -              | -               | -         | d                           |
|    |                  |              | acres            | 1.75       | 3.06      | 0.70      | 0.35          | 0.70           | 0.35        | 0.35          | -         | -           | -              | -         | -         | -              | -               | -         | d                           |

- **a** = American Lotus
- **b** = Aster
- **c** = Bull Tongue
- **d** = Cardinal Flower
- **e** = Common Threesquare
- **f** = Day Flower
- **g** = False Nettle
- **h** = Gerardia
- **i** = Ironweed
- **j** = Marsh Eryngo
- **k** = Primrose Willow
- **l** = Sensitive Fern
- **m** = Sneeze weed
- **n** = Soft Rush
- **o** = Swamp Rose
- **p** = Thoroughwort
- **q** = Turk’s Cap Lily
- **r** = Umbrella Sedge
- **s** = Water Willow
Section III
Caroline County - Snow Creek to Portobago Creek

The marshes in this section comprise 483.13 acres or 98% of the total marsh acreage of this inventory. These marshes are of diverse composition, containing species indicative of those marshes classified as Freshwater Mixed Communities (Type XI). Sizable stands of Jewelweed (Impatiens capensis), Tearthumb (Polygonum arifolium and/or Polygonum sagittatum), Wild Rice (Zizania aquatica), Arrow Arum-Pickerelweed (Peltandra virginica and/or Pontederia cordata), Yellow Pond Lily (Nuphar luteum), Rice Cutgrass (Leersia oryzoides), Sweetflag (Acorus calamus) and Beggar's Ticks (Bidens spp.) can be found throughout many of the marshes in this section. In addition to the above-mentioned flora, various other and less abundant species are found here as well. Some of these include Swamp Rose (Rosa palustris), Swamp Milkweed (Asclepias incarnata), Cardinal Flower (Lobelia cardinalis), and Woolgrass (Scirpus cyperinus), with American Lotus (Nelumbo lutea) found only in marsh 20a.

These marshes are important to the marine detritus food web and are very valuable as spawning and nursery grounds. Some of the species that utilize these areas include American and hickory shad, blueback herring, alewife, striped bass and white perch. Also, due to the diversity of the natural vegetation along the shoreline, wildlife activity is rather high. During August 1977, two bald eagles were observed flying over the upper portions of the Rappahannock River adjacent to Caroline County. In September 1977 a large flock of Canada geese, apparently feeding, was observed in White Marsh. White Marsh, the largest marsh in this section, contains a large stand of Wild Rice, which is eaten by geese as well as many other waterfowl species. Further wildlife activity is exemplified by the presence of beavers, since in many areas freshly girdled trees, beaver dams and ponds are present. For example, marshes 5, 10, 13, 16, and the upper reaches of Portobago Creek showed signs of past and present beaver activity.
Human activity along the shoreline is readily apparent, as evidenced by portions of Goldenvale Creek (page 31) and *Mill Creek (Pneumansend Creek, page 31), having been diked to form Gouldman Pond and Miller's Pond. A highly productive Yellow Pond Lily marsh in Gouldman Pond has been cut off from the estuary.

*Mill Creek branches into Pneumansend Creek
SECTION III A. CAROLINE COUNTY - SNOW CREEK TO DICKS CREEK
### Section III. Snow Creek to Portobago Creek

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a = American Lotus  
b = Aster  
c = Bull Tongue  
d = Cardinal Flower  
e = Common Threesquare  
f = Day Flower  
g = False Nettle  
h = Gerardia  
i = Ironweed  
j = Marsh Eryngo  
k = Primrose Willow  
l = Sensitive Fern  
m = Sneezeweed  
n = Soft Rush  
o = Swamp Rose  
p = Thoroughwort  
q = Turk's Cap Lily  
r = Umbrella Sedge  
s = Water Willow
SECTION III D. CAROLINE COUNTY - WHITE MARSH TO CREEK MOUNT SWAMP
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<th>MARSH LOCATION</th>
<th>TOTAL ACRES</th>
<th>Yellow Pond Lily</th>
<th>Tearthumb</th>
<th>Jewelweed</th>
<th>Wild Rice</th>
<th>Rice Coughgrass</th>
<th>Beggar's Ticks</th>
<th>Pickleweed—Arrowgrass</th>
<th>Water's Miller</th>
<th>Swamp Milkweed</th>
<th>Cattail</th>
<th>Water Hemp</th>
<th>Marsh Hibiscus</th>
<th>Sweetflag</th>
<th>Arrowhead</th>
<th>Swamp Milkweed</th>
<th>Spike Rush</th>
<th>Water Hemlock—Water Poplar</th>
<th>Burush</th>
<th>Balden Bush</th>
<th>St John’s Wort</th>
<th>Woolgrass</th>
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<th>OBSERVATIONS</th>
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<td>12</td>
<td>White Marsh</td>
<td>93</td>
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<td></td>
<td></td>
<td>Large creek marsh dominated by Wild Rice. Prime feeding area for many migratory waterfowl.</td>
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<tr>
<td>13</td>
<td>White Marsh</td>
<td>10</td>
<td>%</td>
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<td>13</td>
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<td>b e n o</td>
<td></td>
<td></td>
<td>Island area with 43% marsh and 55% swamp. Marsh area dominated by Sweetflag.</td>
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<tr>
<td>14</td>
<td>White Marsh</td>
<td>15</td>
<td>%</td>
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<td>Embayed marsh area dominated by Tearthumb, grades into bordering swamp.</td>
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<td>15</td>
<td>Rappahannock River</td>
<td>10</td>
<td>%</td>
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<td>Creek marsh system dominated by Jewelweed, grades into bordering swamp.</td>
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<td>16</td>
<td>Rappahannock River</td>
<td>46</td>
<td>%</td>
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<td>Creek marsh system dominated by Jewelweed and Tearthumb, upper end dammed by beavers and grades into swamp.</td>
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<tr>
<td>17</td>
<td>Rappahannock River</td>
<td>1.60</td>
<td>%</td>
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<td>Relatively high fringe marsh.</td>
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<td>Low fringe marsh.</td>
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<td>d h p</td>
<td>-0.23</td>
<td></td>
<td>Creek marsh dominated by Tearthumb, grades into bordering swamp.</td>
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</tbody>
</table>

a = American Lotus  
b = Aster  
c = Bull Tongue  
d = Cardinal Flower  
e = Common Three square  
f = Day Flower  
g = False Nettle  
h = Gerardia  
i = Ironweed  
j = Marsh Eryngo  
k = Primrose Willow  
l = Sensitive Fern  
m = Sneeze weed  
o = Soft Rush  
p = Swamp Rose  
q = Turk's Cap Lily  
r = Umbrella Sedge  
s = Water Willow
SECTION III F. CAROLINE COUNTY-ROYS RUN TO PORTOBAGO BAY
### Section III. Snow Creek to Portobago Creek (Continued)

| #   | MARSH LOCATION        | TOTAL ACRES | Yellow Pond Lily | Tearthumb | Jewelweed | Wild Rice | Rice Cougrass | Beggars' Ticks | Pickerweed—Arrow Awn | Walter's Millet | Shortweed | Cattail | Water Hemps | Marsh Hailous | Sweetging | Arrowhead | Swamp Milkweed | Wood Reedgrass | Spike Rush | Hemlock—Water Hemlock | Burush | Button Bash | St. John's Wort | Woolgrass | OTHER | OBSERVATIONS |
|-----|-----------------------|-------------|------------------|-----------|-----------|-----------|---------------|----------------|----------------------|----------------|-----------|---------|------------|--------------|----------|----------|----------------|---------------|-----------|---------------------|--------|-------------|-----------------|-----------|-------|
| 20  | Rappahannock River    | 2.50        |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.08 0.63 0.25 0.50 0.05 0.15 0.02 | -      | -         | 1         | -         | -              | -              | -                     | -              | -         |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 20a | Rappahannock River    | 9           |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 1.80 1.35 1.35 2.70 1.35 | -      | -         | -         | -         | -              | -              | -                     | -              | -         |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 21  | Rappahannock River    | 5           |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.78 5.85 5.85 3.90 | -      | -         | -         | -         | -              | -              | -                     | -              | -         |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 22  | Goldenvale Creek (North) | 0.25   |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.25          |          |          |          |          |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 23  | Goldenvale Creek      | 26          |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 7.80 5.20 1.30 3.90 1.95 1.35 0.39 1.17 | -      | -         | -         | -         | -              | -              | -                     | -              | -         |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 24  | Goldenvale Creek      | 0.75         |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.25          |          |          |          |          |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 25  | Roys Run (North)      | 0.50         |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.50          |          |          |          |          |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
| 26  | Roys Run              | 7            |                  |           |           |           |                |                |                      |                |          |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |
|     | acres                  | 0.35 1.60 1.05 0.70 0.35 1.75 | 0.14  | 0.14 0.35 0.70 0.07 | -      | -         | -              | -              | -                     | -              | -         |         |            |              |          |          |                |               |           |                      |        |             |                 |           |       |              |

a = American Lotus  
b = Aster  
c = Bull Tongue  
d = Cardinal Flower  
e = Common Threesquare  
f = Day Flower  
g = False Nettle  
h = Gerardia  
i = Ironweed  
j = Marsh Eryngo  
k = Primrose Willow  
l = Sensitive Fern  
m = Sneeze weed  
n = Soft Rush  
o = Swamp Rose  
p = Thoroughwort  
q = Turk's Cap Lily  
r = Umbrella Sedge  
s = Water Willow
## Section III. Snow Creek to Portobago Creek (Continued)

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<td>Relatively high embayed marsh with scattered trees. Area grades into bordering swamp dominated by Rice Cutgrass.</td>
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<td>Island area containing a mixture of trees with marsh species scattered throughout.</td>
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<td>Fringe marsh dominated by Rice Cutgrass, grades into swamp.</td>
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<td>Series of marsh fringes, and a marsh peninsula dominated by Wild Rice.</td>
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- b = Aster
- c = Bull Tongue
- d = Cardinal Flower
- e = Common Thressquarle
- f = Day Flower
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<td>Small embayed marsh containing 30% Tearchumb.</td>
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<td>Embayed fringe marsh area dominated by Tearchumb and Jewelweed,</td>
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<td>Marsh Island dominated by Wild Rice.</td>
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<td>Creek marsh area somewhat embayed, dominated by Wild Rice, grades into swamp.</td>
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<td>41</td>
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<td>Shallow area containing 100% Yellow Pond Lily</td>
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<td>Small embayed marsh area dominated by Marsh Hibiscus.</td>
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a = American Lotus  
b = Aster  
c = Bull Tongue  
d = Cardinal Flower  
e = Common Threesquare  
f = Day Flower  
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r = Umbrella Sedge  
s = Water Willow
SECTION III G. CAROLINE COUNTY-PORTOBAGO BAY TO PORTOBAGO CREEK
### Section III. Snow Creek to Portobago Creek (Continued)

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<td>%</td>
<td>Area dammed by beavers, containing non-tidal marsh system.</td>
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<td>44</td>
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<td>Embayed creek marsh dominated by Tearthumb.</td>
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<td>Embayed marsh area dominated by Jeweved.</td>
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<td>Point marsh dominated by Tearthumb.</td>
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<td>Long fringe marsh dominated by Yellow Pond Lily, area has some embayed marshes.</td>
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<tbody>
<tr>
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<td>c = Bull Tongue</td>
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<tr>
<td>d = Cardinal Flower</td>
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<tr>
<td>e = Common Threesquare</td>
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<td>i = Ironweed</td>
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<td>j = Marsh Eryngo</td>
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<td>g = False Nettle</td>
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<td>h = Gerardia</td>
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<td>l = Sensitive Fern</td>
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<td>m = Sneeze weed</td>
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<tr>
<td>p = Thoroughwort</td>
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<tr>
<td>q = Turk's Cap Lily</td>
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<tr>
<td>r = Umbrella Sedge</td>
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<td>s = Water Willow</td>
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GRAND TOTAL OF MARSHES AND SUMMARY OF MAJOR MARSH COMMUNITIES OF THE CITY OF
FREDERICKSBURG, SPOTSYLVANIA COUNTY AND CAROLINE COUNTY

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<tr>
<th>Grand Total</th>
<th>Yellow Pond Lily</th>
<th>Tearthumb</th>
<th>Jewelweed</th>
<th>Wild Rice</th>
<th>Rice Cut-Grass</th>
<th>Beggar's Ticks</th>
<th>Pickerelweed</th>
<th>Arrow Arum</th>
<th>Walter's Millet</th>
<th>Smartweed</th>
<th>Cattail</th>
</tr>
</thead>
<tbody>
<tr>
<td>acres</td>
<td>492.52</td>
<td>24.36</td>
<td>96.43</td>
<td>86.30</td>
<td>82.59</td>
<td>31.16</td>
<td>47.35</td>
<td>41.17</td>
<td>11.06</td>
<td>11.49</td>
<td>9.08</td>
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</thead>
<tbody>
<tr>
<td>acres</td>
<td>10.91</td>
<td>5.09</td>
<td>9.25</td>
<td>10.67</td>
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</table>

<table>
<thead>
<tr>
<th>Woolgrass</th>
</tr>
</thead>
<tbody>
<tr>
<td>acres</td>
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</table>

Other: a - American Lotus, b - Aster, c - Bull Tongue, d - Cardinal Flower, e - Common Threesquare, f - Day Flower, g - False Nettle, h - Gerardia, i - Ironweed, j - Marsh Eryngo, k - Primrose Willow, l - Sensitive Fern, m - Sneezeweed, n - Soft Rush, o - Swamp Rose, p - Thoroughwort, q - Turk's Cap Lily, r - Umbrella Sedge, s - Water Willow

**TYPE IX. YELLOW POND LILY**

Destruction of the community would result in a decrease in number and diversity of aquatic animal life in the immediate area. The greatest value the community has is its habitat for aquatic biota. This type should be ranked with or slightly higher than a Black Needlerush (Type III) marsh.

**TYPE XI. FRESHWATER MIXED COMMUNITY**

These are very valuable marshes and the aim should be to keep them in a natural state. This type of marsh would be ranked equivalent to a Saltmarsh Cordgrass Marsh (Type I) and an Arrow Arum-Pickerelweed (Type VII) marsh.
<table>
<thead>
<tr>
<th>Location</th>
<th>Page</th>
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</thead>
<tbody>
<tr>
<td>Caroline County</td>
<td>27-41</td>
</tr>
<tr>
<td>Creek Mount Swamp</td>
<td>33,34</td>
</tr>
<tr>
<td>Deep Run</td>
<td>24</td>
</tr>
<tr>
<td>Dicks Creek</td>
<td>29,31</td>
</tr>
<tr>
<td>Fredericksburg, City of</td>
<td>20-22</td>
</tr>
<tr>
<td>Goldenvale Creek</td>
<td>35,37</td>
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<tr>
<td>Massaponax Creek</td>
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<tr>
<td>Mill Creek (Pneumansend Creek)</td>
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<tr>
<td>Moss Neck</td>
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<td>Snow Creek</td>
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<td>Ware Creek</td>
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<tr>
<td>White Marsh</td>
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