CITY OF VIRGINIA BEACH MARSH INVENTORY

Volume 3. Back Bay and Tributaries

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Preface

This publication is one of a series of county and city tidal marsh inventories prepared by the Wetlands Advisory Group of the Virginia Institute of Marine Science. The previously published reports include:

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 and 2
City of Newport News and Fort Eustis
Accomack County
Northampton County
Westmoreland County
James City County and the City of Williamsburg
Surry County
Spotsylvania and Caroline Counties and the City of Fredericksburg
New Kent County
Essex County
Isle of Wight County
Middlesex County
City of Norfolk
King William County and Town of West Point
King and Queen County
Prince George County and City of Hopewell
City of Portsmouth

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. This inventory program is designed to aid the local wetlands boards, the state and federal regulatory agencies, and regional planning districts in making informed rational decisions on the uses of these valuable resources. They are also intended for use by the general public as a natural history guide and the scientific community as a research data source.

The reader is referred to the Shoreline Situation Report, City of Virginia Beach, SRAMSOE No. 163, Virginia Institute of Marine Science, Gloucester Point, Virginia 23062. This report focuses on various shoreline characteristics including areas of erosion and accretion, beaches, marshes, artificially stabilized areas, and fastland types and uses.

Also of interest may be a booklet, Wetlands Guidelines, available from the Marine Resources Commission, Newport News, Virginia, which describes the wetlands types and the types of shoreline activities which affect wetlands and what these effects are.

Acknowledgements

I would like to thank the many boat operators whose tireless efforts made this inventory possible including: Jeff Jacobs, Phil Murphree, Damon Doumlele, Arthur Harris, Joe Mizell, Jon Lucy, Jimmy Greene, David Rowe and Hank Hennigar.

The following individuals contributed to the inventory by providing access to certain areas or by providing overnight boat moorings: Steve Brantley, Dam Neck Naval Station, Eddie Baird and the Beggar's Bridge Hunt Club, Ma Lovitt of Lovitt's Landing and Otto Halstead at the Trojan Waterfowl Management Area.

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Introduction

Of all the tidal wetlands in Virginia, the marshes around Back Bay are among the most unique. They are the product of a very dynamic environment that has shaped and reshaped these marshes. Over the years Back Bay has ranged from a lunar tidal brackish estuary to a wind tidal freshwater system. Today's plant and animal communities reflect the sum total of these changes.

To put the Back Bay system, as it exists today, in its proper perspective one must go back several hundred years to when the Old Currituck Inlet (1650-1729) across from Knotts Island and the New Currituck Inlet (1713- 1828) further south were open to the Atlantic Ocean. These undoubtedly exerted a much stronger lunar tidal influence that resulted in higher salinities than currently exist. The large populations of big cordgrass and black needlerush, both of which are estuarine species, are probably a legacy of this estuarine influence.

With the inlets closed, the only salinity sources were periodic oceanic overwashes across the barrier spit and the Albemarle and Chesapeake Canal via the North Landing River. Locks closed off the Canal in 1932 and dune construction by the Civilian Conservation Corps along the coast during the 1930's stopped most of the overwash events. This situation allowed freshwater to slightly brackish conditions to develop throughout the Back Bay system and persisted for the most part until 1962 when the Ash Wednesday Storm caused massive overwashes and significantly raised the salinity in Back Bay.

This event coincided with a major study being conducted by the U. S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission and the Virginia Commission of Game and Inland Fisheries to determine the cause of the recent decline of submerged aquatic vegetation (SAV) in Back Bay. As a result of this study and the increase in water clarity and plant growth following the Ash Wednesday Storm, the decision was made to raise the salinity of Back Bay to help flocculate suspended silts and clays and and increase flushing by pumping saltwater from the ocean into Back Bay. It was anticipated that this would help increase the clarity of the water and thus improve the growth of SAV.

Pumping began in 1964 with the goal of maintaining 10% sea strength or 3.5 parts per thousand salinity in Back Bay. This continued on a fairly regular basis until 1974 when maintenance problems began and ceased in 1977 when the pier burned down. Essentially freshwater conditions prevailed until 1978 when pumping resumed on a regular basis and quickly reestablished brackish conditions. In 1985 a modified pumping schedule was adopted by the City of Virginia Beach which essentially terminated pumping and the Bay gradually returned to a freshwater regime.

These fluctuations in both salinity and tidal action have resulted in changes in the composition of both the emergent wetland and submerged aquatic plant communities in Back Bay. This inventory was performed during one of the freshwater episodes when

numerous freshwater plant species were present in association with the more dominant brackish species and the submerged aquatic vegetation was particularly abundant. It appears that the brackish marsh plants are more adaptable to the periods of freshwater than the freshwater plants are to the periods of brackish conditions, hence the relative dominance of the brackish species. And these plant communities are not static as evidenced by changes in the coverage of common reed, *Phragmites australis,* which has doubled and trebled in many situations according to recent (1989) observations.

In approximately 1965 Eurasian watermilfoil, *Myriophyllum spicatum*, was discovered growing in Back Bay. It gradually increased its cover until it virtually covered the entire bay in 1972. Increases in other native aquatics also occurred until in 1977 when this inventory was conducted virtually the entire bay bottom was covered with SAV. Milfoil was usually found in the deeper areas with many of the native species found in the shallower areas and along the margins of the Bay. The dominant species of SAV observed during 1977 included the following:

Eurasian watermilfoil	*Myriophyllum spicatum*
Sago pondweed	*Potamogeton pectinatus*
Wild celery	*Vallisneria americana*
Widgeongrass	*Ruppia maritima*
Bushy pondweed	*Najas quadalupensis*
Redheadgrass	*Potamogeton perfoliatus*
Muskgrasses	*Chara* spp. and *Nitella* spp.
Water arrowhead	*Sagittaria subulata*

The combination of these resources, wetland, water quality and SAV, when at their peaks, has given Back Bay a reputation as one of the premier aquatic habitats for waterfowl and largemouth bass along the Atlantic seaboard.

Methods

Wetland locations and wetland boundaries were obtained by consulting USGS topographic maps and aerial photographs. The configuration and areal extent of each marsh was confirmed by observations by boat, on foot or by low level overflights. Individual plant species percentages are quantitative estimates of coverage based on visual inspections of every marsh.

These percent cover estimates are subject to a seasonal bias depending on what time of the year the estimates are made. In the brackish water marshes if the observations are in the spring many of the late developing annuals, e.g. water hemp, saltmarsh aster, marsh fleabane and orach, are not visible among the earlier developing grasses. In the freshwater marshes the spring and early summer dominants are usually the perennials, e.g. arrow arum, pickerelweed and cattails. During late summer and early fall these are often replaced by beggars ticks and rice cutgrass as the dominant species in the same marsh. This inventory was conducted during the late summer and early fall of 1977. Back Bay was particularly well suited to this time frame because there was a relatively small amount of the early developing freshwater species and there was a sufficient amount of the early grasses remaining to obtain accurate estimates of their cover. There was also a large number of late developing species that were included in this inventory that would have been missed if it had been done during the spring and early summer.

The outline of each marsh as depicted on the topographic map was planimetered to determine its acreage. Marshes 0.25 acres or larger are designated by number. The acreage, plant species percentage and acreage, marsh type and other observations are recorded in tabular form for each of these marshes. Marshes less than 0.25 acres (usually narrow fringing marshes and very small pocket marshes) are indicated by the same shaded symbol as the numbered marshes but are not included in the tabulations. The size of the small marshes (less than one acre) is exaggerated on the maps for clarity and is not always to scale. The USGS topograghic maps used as the base maps for this inventory were prepared in the early 1950's and photo revised in 1970 and 1971. As a consequence, there were a number of phyisograghic and cultural changes which have occurred, e. g. considerable shoreline erosion has occurred in many places reducing the existing areas of wetlands including several small marsh islands that have completely eroded away. Additionally, several areas have been filled by dredge and fill operations which further reduced the existing wetland acreage.

Plant species percentages are recorded to the nearest percent and acreages to the nearest 0.1 acre in the larger marshes and the nearest 0.01 acre in the smaller marshes. The acreages of the smaller marshes are probably not accurate to the second decimal. This is used, however, as a means to more accurately balance the the calculated acreages of the individual species. In those instances where an individual plant species was estimated to amount to less than 0.5 percent or 0.05 acre, the symbol (-) is used to indicate a trace amount. In unusual situations where an individual marsh was estimated to contain more than 50 percent or more of a species not listed as a marsh type, the closest applicable marsh type was used. For example, a marsh judged to contain 50 percent marsh hibiscus would be listed as Type XI (Freshwater Mixed).

Areas surveyed included all emergent herbaceous vegetation including adjacent scrub shrub communities. This inventory generally does not include areas of swamp forest because of the difficulty in determining whether these areas met the requirement for periodic inundation contained within the Wetlands Act. This determination is made when necesssary on a case-by-case basis when jurisdiction is in question on a particular project. Given the appropriate elevation and vegetation, which are present in many instances, many of these swamp forests would be covered under the Wetlands Act, greatly increasing the acreage of tidal wetlands in Back Bay.

Marsh Types and Evaluation

For a better understanding of what is meant by marsh types, some background information is required. The personnel of the Wetland Advisory Group 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, 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 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-Pickerel Weed 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-Pickerel Weed (Type VII)
Freshwater Mixed (Type XI)
Brackish Water Mixed (Type XII)

Group One marshes have the highest values in productivity and 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 are 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.

Group Three: Yellow Pond Lily (Type IX)
Black Needlerush (Type III)

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.

Marsh Plants

Common names and scientific names as found in the data tables of this report.

American Lotus	*Nelumbo lutea* (Willd.) Persoon
Ammannia	*Ammannia teres* Raf.
Arrow Arum	*Peltandra virginica* (L.) Kunth
Arrow Grass	*Triglochin striata* R.&P.
Arrowhead*	*Sagittaria latifolia* Willd.
Bald Cypress	*Taxodium distichum* (L.) Rich
Beak-Rush	*Rhynchospora* spp.
Bedstraw	*Galium tinctorium* L.
Beggar's Ticks*	*Bidens coronata* (L.) Britton
Big Cordgrass*	*Spartina cynosuroides* (L.) Roth
Black Willow	*Salix nigra* Marshall
Blue Flag	*Iris virginica* L.
Boneset	*Eupatorium perfoliatum* L.
	Eupatorium serotinum Michaux
Bur-Head	*Echinodorus cordifolius* L. Grisebach
Buttercup	*Ranunculus* spp.
Button Bush	*Cephalanthus occidentalis* L.
Cane	*Arundinaria gigantea* (Walter) Muhl
Cardinal Flower	*Lobelia cardinalis* L.
Cattails*	*Typha angustifolia* L.
	Typha latifolia L.
Climbing Hempweed	*Mikania scandens* (L.) Willd.
Common Reed	*Phragmites australis* (cav.) Trin. ex Steud.
Common Threesquare*	*Scirpus americanus* Pers.
Dayflower	*Commelina virginica* L.
Dodder	*Cuscuta* sp.
Duckweed	*Lemna* sp.
Dune Bean	*Strophyostyles helvola* (L.) Ell.
Eclipta	*Eclipta alba* (L.) Hasskarl
Eryngo	*Eryngium aquaticum* L.
False Loosestrife	*Ludwigia decurrens* Walter
False Nettle	*Boehmeria cylindrica* (L.) Swartz
Fireweed	*Erechtites hieracifolia* (L.) Raf.
Foxtail Grass	*Setaria magna* Grisebach
	Setaria glauca (L.) Beauvois
	Setaria geniculata (Lam.) Beauvois
Frogfruit	*Lippia lanceolata* Michx.
Germander	*Teucrium canadense* L.
Groundsel Tree*	*Baccharis halimifolia* L.
Jewelweed	*Impatiens capensis* Meerb
Lilaeopsis	*Lilaeopsis carolinensis* C.&.R.
	Lilaeopsis chinensis (L.) Knutze
Live Oak	*Quercus virginiana* Miller
Lizard's-tail	*Saururus cernuus* L.
Lobelia	*Lobelia elongata* Small
Marsh Elder*	*Iva frutescens* L.
Marsh Fern	*Thelypteris palustris* Schott
Marsh Fimbristylis	*Fimbristylis spadicea* (L.) Vahl
Marsh Fleabane	*Pluchea purpurascens* (Swartz) DC
Marsh Hibiscus*	*Hibiscus moscheutos* L.
Marsh Mallow	*Kosteletskya virginica* Presl.
Marsh Pink	*Sabatia stellaris* Pursh
Meadow-Beauty	*Rhexia virginica* L.
Mermaid-Weed	*Proserpinaca palustris* L.
Mock Bishop's-Weed	*Ptilimnium capillaceum* (Michaux) Raf.
Mud Plantain	*Heteranthera reniformis* R.&P.
Needle Rush*	*Juncus roemerianus* Scheele
Nodding Ladies' Tresses	*Spiranthes cernua* (L.) Richard
Nut Sedge	*Cyperus* spp.
Olney Threesquare*	*Scirpus olneyi* Gray
Panic Grass	*Panicum dichotomiflorum* Michaux
Partridge Pea	*Cassia fasciculata* Michaux
Pennywort	*Hydrocotyle umbellata* L.
	Hydrocotyle verticillata Thunberg
Pickerelweed*	*Pontederia cordata* L.
Plumegrass	*Erianthus giganteus* (Walter) Muhl.

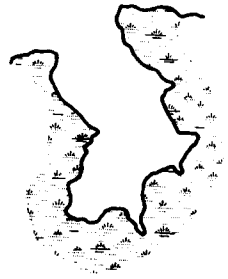
Red Maple	*Acer rubrum* L.
Rice Cutgrass*	*Leersia oryzoides* (L.) Sw.
Royal Fern*	*Osmunda regalis* L.
Rushes	*Juncus acuminatus* Michaux
	Juncus effusus L.
	Juncus scirpoides Lam.
	Juncus spp.
Sacciolepis	*Sacciolepis striata* (L.) Nash
Saltmarsh Aster	*Aster subulatus* Michaux
	Aster tenuifolius L.
Saltmarsh Bulrush	*Scirpus robustus* Pursh
Saltmarsh Cordgrass*	*Spartina alterniflora* Loisel.
Saltmarsh Loosestrife	*Lythrum lineare* L.
Salt Meadow Hay*	*Spartina patens* (Aiton) Muhl.
Saltwort	*Salicornia* sp.
Seaside Goldenrod	*Solidago sempervirens* L.
Sedge	*Carex* spp.
Smartweed*	*Polygonum punctatum* Ell.
Soft Stem Bulrush*	*Scirpus validus* Vahl.
Spikerush*	*Eleocharis fallax* Weatherby
	Eleocharis parvula (R.+S.) Link
Sprangletop	*Leptochloa fasicularis* (Lam.) Gray
Swamp Loosestrife	*Decodon verticillatus* (L.) Ell.
Swamp Milkweed	*Asclepias incarnata* L.
Swamp Rose	*Rosa palustris* Marshall
Sweet Flag	*Acorus calamus* L.
Sweet Gum	*Liquidambar styraciflua* L.
Switch Grass*	*Panicum virgatum* L.
Tearthumb	*Polygonom* arifolium L.
	Polygonum sagittatum L.
Water Dock*	*Rumex verticillatus* L.
Water Fern	*Azolla caroliniana* Willd.
Water Hemlock	*Cicuta maculata* L.
Water Hemp*	*Amaranthus cannabinus* (L.) J.D. Sauer
Water Horehound	*Lycopus virginicus* L.
Water Hyssop	*Bacopa caroliniana* (Walt.) Robins
Water Lily	*Nymphaea odorata* Aiton
Water Parsnip	*Suim suave* Walter
Wax Myrtle*	*Myrica cerifera* L.
Wild Millet	*Echinochloa walteri* (Pursh) Nash
Wild Rice*	*Zizania aquatica* L.
Wild Rye Grass	*Elymus virginicus* L.
Woolgrass	*Scirpus cyperinus* (L.) Kunth

*Species included in the Wetlands Act of 1972.

Glossary of Descriptive Terms

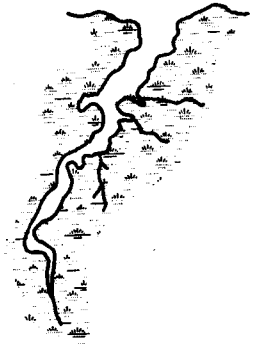
Cove Marsh

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.



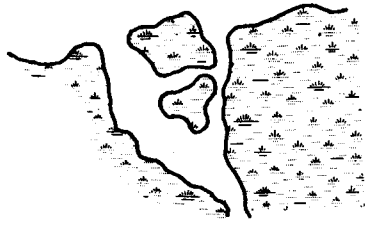
Creek or Embayed Marsh

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.



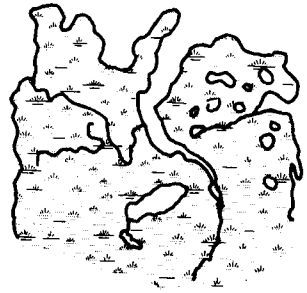
Delta Marsh

A marsh 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.



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 a section of shoreline and generally has a much greater length than width or depth.

High Marsh

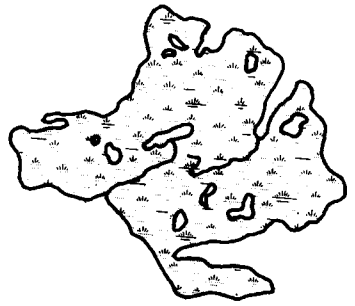
The marsh surface is at an elevation of mean high water or above; it is usually inundated less than twice daily by tidal action.

Low Marsh

The marsh surface is at an elevation below mean high water; it is usually inundated twice daily by tidal action.

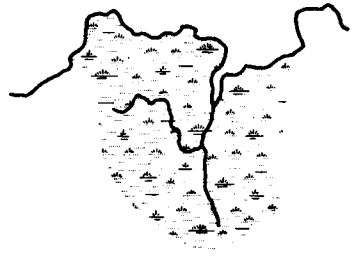
Marsh Island

An isolated marsh surrounded on all sides by open water. Interior portions of the marsh may contain trees scattered at highest elevations.



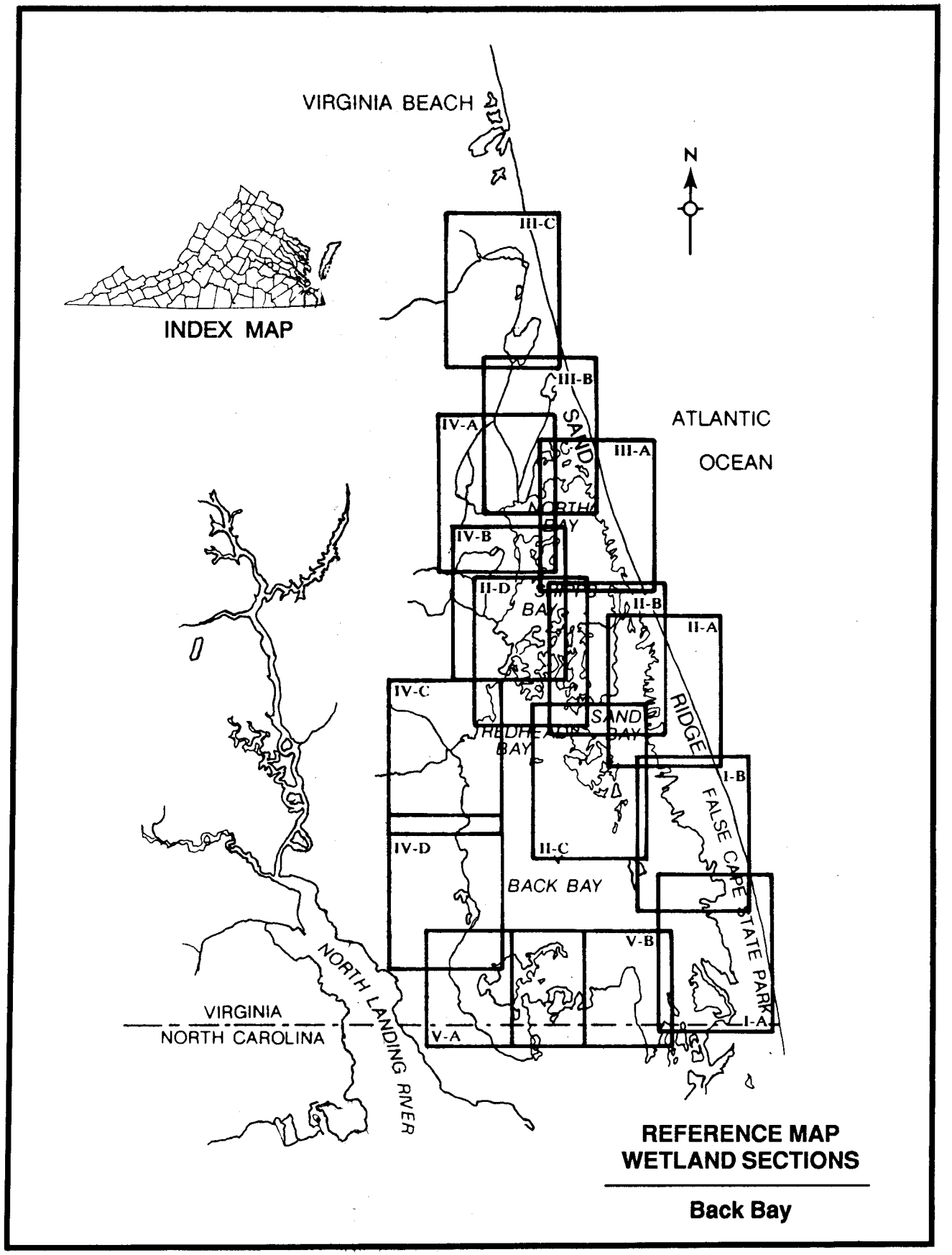
Pocket Marsh

A marsh contained within a small, essentially semi-circular area on a shoreline.



Point or Spit Marsh

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.


VIRGINIA BEACH
N
INDEX MAP
III-C
III-B
IV-A
III-A
ATLANTIC
OCEAN
SAND
RIDGE
IV-B
II-D
II-B
II-A
BAY
IV-C
SAND
RIDGE
BAY
I-B
FALSE CAPE STATE PARK
IV-D
II-C
BACK BAY
V-B
VIRGINIA
NORTH CAROLINA
V-A
I-A
NORTH LANDING RIVER
REFERENCE MAP
WETLAND SECTIONS
Back Bay

Section I

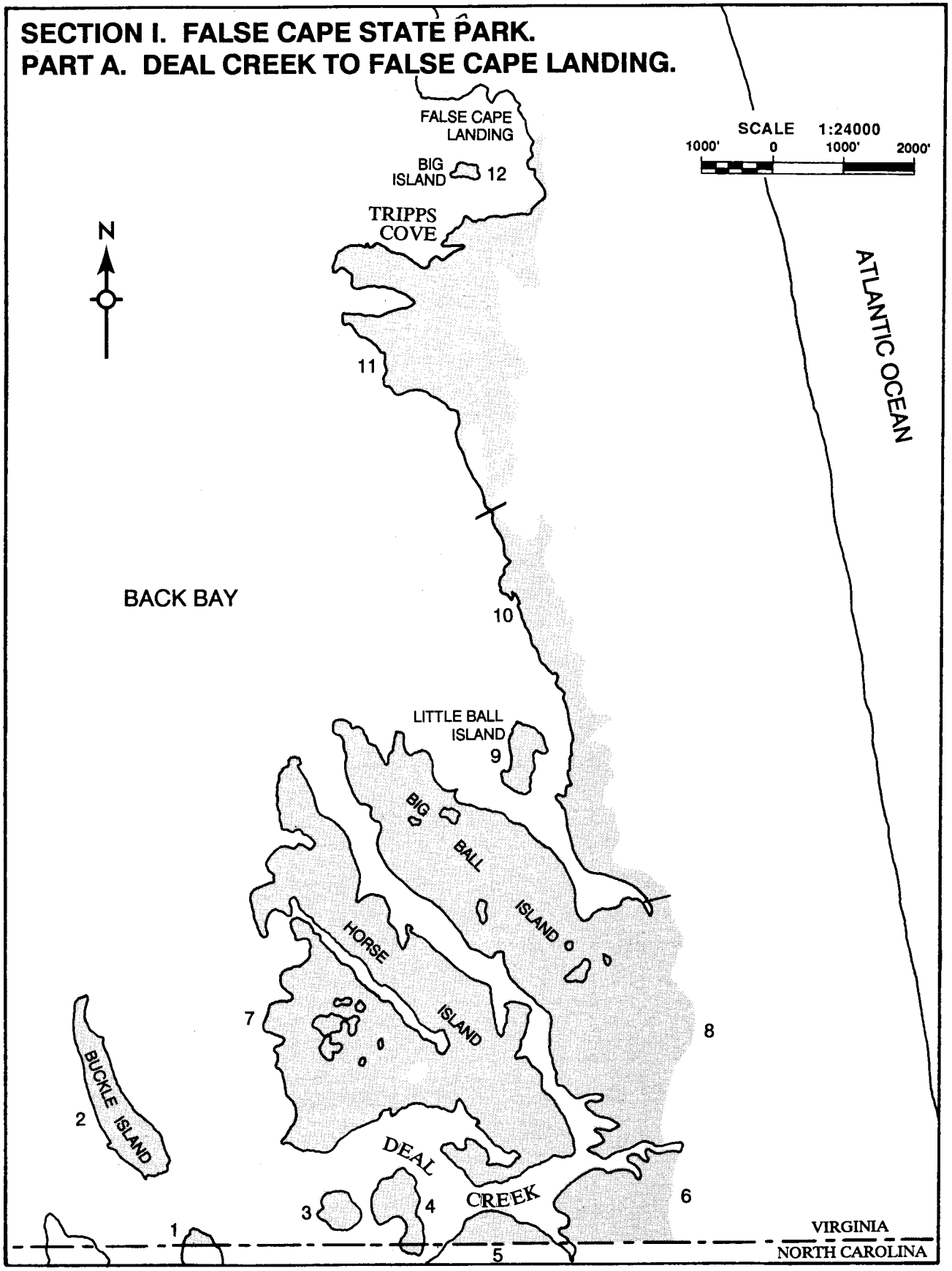
False Cape State Park

The wetlands within this section are contained within False Cape State Park and The Barbours Hill Wildlife Management Area. They are dominated by black needlerush (492) and cattails (324) for a total of 1188 acres.

The majority of the wetlands in this section are large marshes which have developed on the landward side of the barrier spit. The marshes in the southern portion of this section have developed on the relicts of the flood tide delta of the Old Currituck Inlet.

The remainder have developed as broad fringing marshes on old overwash and inlet features. Also included are the marshes on Cedar and Little Cedar Islands which are part of a relict beach ridge that used to extend from Knotts Island up to Sandbridge.

Included within this section are 129 acres of impoundments on Barbours Hill WMA which are managed for moist soil emergent vegetation during the spring and summer and flooded during the fall and winter for migratory waterfowl.


SECTION I. FALSE CAPE STATE PARK.
PART A. DEAL CREEK TO FALSE CAPE LANDING.
FALSE CAPE LANDING
BIG ISLAND
12
TRIPPS COVE
N
SCALE 1:24000
1000' 0 1000' 2000'
ATLANTIC OCEAN
11
BACK BAY
10
LITTLE BALL ISLAND
9
BIG BALL ISLAND
HORSE ISLAND
7
8
BUCKLE ISLAND
2
DEAL CREEK
3
4
6
1
5
VIRGINIA
NORTH CAROLINA

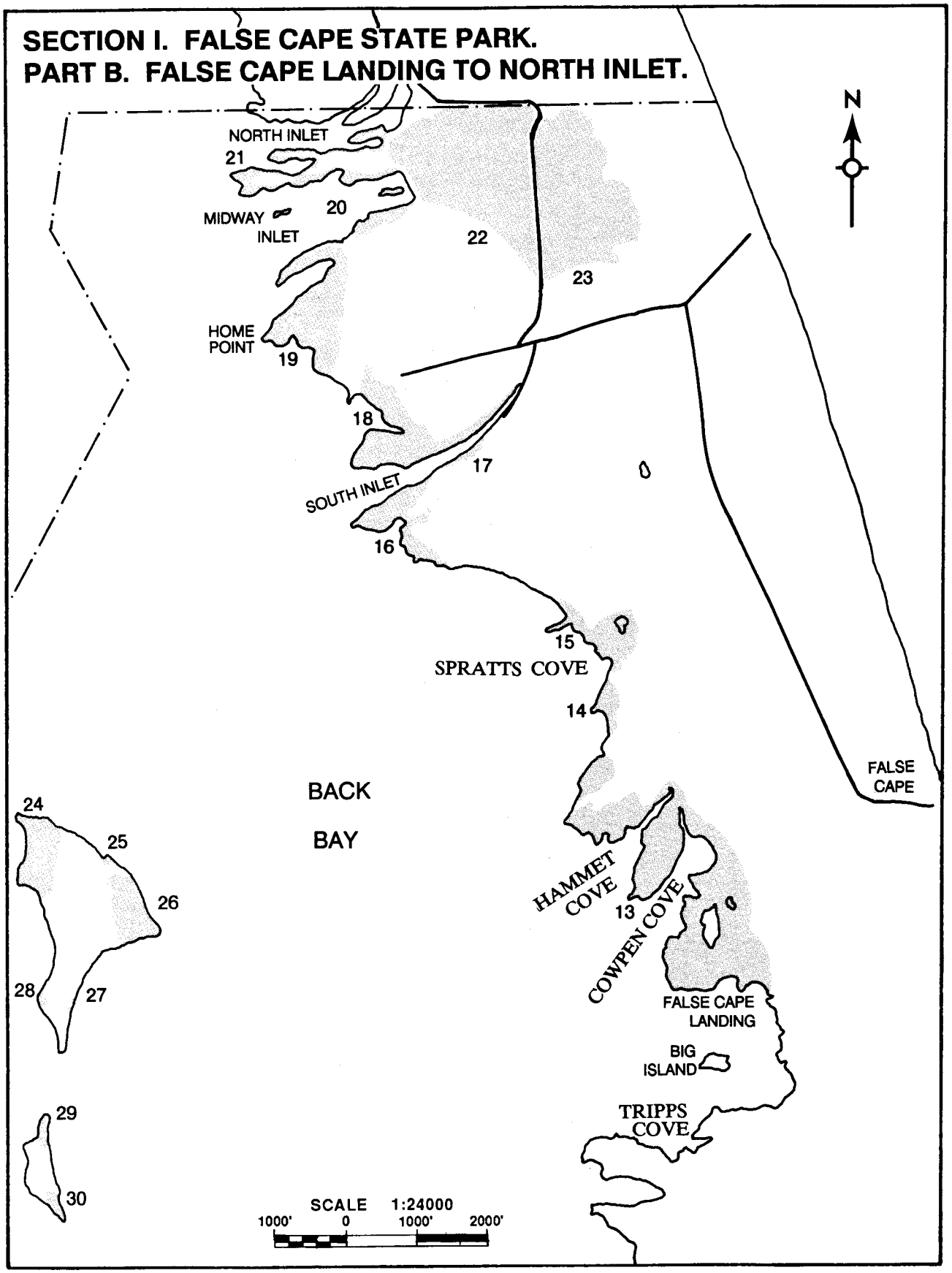
Section I. False Cape State Park. Part A. Deal Creek to False Cape Landing.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
1	Mon Island	1.93	%	61	5	15	12	--		1	2	--	--	1	--	--	--	--	1			
			acres	1.18	.10	.29	.23			.02	.04			.02					.02			
2	Buckle Island	28.16	%	15	20	10	20	1		1	15	--	5	--	10	--	--	--	--		--	
			acres	4.22	5.63	2.82	5.63	.28		.28	4.22		1.41		2.82							
3	Little Simon Island	5.95	%	1	30	30	--	9		--	4	--	2	--	12	--	--		1	--	--	
			acres	.06	1.79	1.79		.54			.24		.12		.71				.06			
4	Big Simon Island	13.02	%	--	5	81	1		--	--	3	--	1	1	2	--	--		1	--		
			acres		.65	10.55	.13				.39		.13	.13	.26				.13			
5	Deal Island	11.82	%	--	4	70	1	--			2	--	1	--	1	--	--		--	2	--	--
			acres		.47	8.27	.12				.24		.12		.12					.24		
6	Deal Creek	41.54	%	2	4	50	1	--		--	--				--	--	--	--	--	--	--	1
			acres	.83	1.66	20.77	.42															.42
7	Horse Island	269.06	%	3	4	35	45	--		--	2	--	1	--	1	--	--	--	1	--		--
			acres	8.07	10.76	94.17	121.08				5.38		2.69		2.69				2.69			
8	Big Ball Island	265.08	%	3	3	37	47	--		--	1	--	--	--	--	--	--	--	1	--	--	--
			acres	7.95	7.95	98.08	124.59				2.65								2.65			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
1		--		1				--	--	--	--	--				--	--		ff1, ww-	Small portion of marsh island mostly in North Carolina	V
				.02															ff.02		
2		1	--	--	--			1	--	1		--	--		--	--	--		o-, ff-, f-, oo-, ww-, gg-	Large marsh island	XI
		.28						.28		.28											
3		1						--	--	--	--		--			4	1		o3, ff2, ss-, ww-	Meadow and needlerush dominated marsh island	XI
		.06														.24	.06		o.18, ff.12		
4		--						2	--	--		--	--			1	--		o-, ff1, ww1, ss-	Needlerush dominated marsh island	III
								.26								.13			o.13, ff.13		
5		16		--	--			--		--	--		1	--		--	2		ww-, cc-, ff-, am-	Fringe of three square, switchgrass on north end and scattered shrubs	III
		1.89											.12				.24				
6		1	--	--	40			--	--	--	--		--	--		--	1	--	o-, ff-, ss-, ww-	Part of a larger marsh in North Carolina. Large stand of wax myrtle	III
		.42			16.62												.42				
7		4	--	--	--			--	--	--		--	--	--	--	3	--		d-, o-, ff1, oo-, ss-, ww-	Large marsh island dominated by cattails and needlerush	XI
		10.76														8.07			ff2.69		
8		1	6	--	--		--	--	--	--		--	--	--	--	--	1		o-, ff-, oo-, b-, ww-, ss-, am-	Extensive marsh with scattered ponds	XI
		2.65	15.90														2.65				

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
9	Little Ball Island	9.34	%	1	2	74	1	--			1	--		2	1	--	--	--	3	--		
			acres	.09	.19	6.91	.09				.09			.19	.09				.28			
10	Wash Woods	71.58	%	7	2	63	17	--		1	1	--	1	--	--	--	--	--	1			
			acres	5.01	1.43	45.10	12.17			.72	.72		.72						.72			
11	Tripps Cove	133.16	%	25	5	25	35	--	--	--	3	--	2	--	--	--	--	--	1			
			acres	33.29	6.66	33.29	46.61				3.99		2.66						1.33			
12	Big Island	1.81	%	--	4	67	20	1		1	2		--	--	--	1	--		--			
			acres		.07	1.21	.36	.02		.02	.04					.02						
	Total Section I. Part A.	852.45	%																			
			acres	60.70	37.36	323.25	311.43	.84		1.04	18.00		7.85	.34	6.69	.02			7.88	.24		.42
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
9		--	15					--	--	--		--		--		--	--		d-, o-, ff-, ss-, cc-, am-	Small marsh island dominated by needlerush	III
			1.40																		
10		1	--		4		--	--	--	--	--		2	--		--	--	--	ff-, oo-, ww-, ss-, am-	Extensive needlerush marsh with scattered wax myrtle and willow	III
		.72			2.86								1.43								
11		--	--	--	3	--		--	--	--	--	--	--	--		--	--	--	f-, oo-, ss-, cc1, m-, am-	Spit marsh complex with well developed shrub zone along upland	XI
					3.99														cc1.33		
12		--								--		--	2			1			ff1	Small needlerush dominated island	III
													.04			.02			ff.02		
T																					
		16.78	17.30	.02	23.47			.54		.28			1.59			8.46	3.37		4.62		


SECTION I. FALSE CAPE STATE PARK.
PART B. FALSE CAPE LANDING TO NORTH INLET.
N
NORTH INLET
21
MIDWAY INLET
20
22
23
HOME POINT
19
18
17
SOUTH INLET
16
15
SPRATTS COVE
14
FALSE CAPE
BACK BAY
24
25
26
28
27
HAMMET COVE
13
COWPEN COVE
FALSE CAPE LANDING
BIG ISLAND
TRIPPS COVE
29
30
SCALE 1:24000
1000' 0 1000' 2000'

Section I. False Cape State Park. Part B. False Cape Landing to North Inlet.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
13	Cowpen/Hammet Cove	82.18	%	1	1	89	--	--		--	--	--	2	1	--	--	--	1	5			--
			acres	.82	.82	73.14							1.64	.82				.82	4.11			
14	Spratts Cove	3.89	%	12	1	70	--	--		--	--		15	--	--		--	--	--			
			acres	.47	.04	2.72							.58									
15	Spratts Cove	11.55	%	20	5	57	--	--					10		--		1	--	--			
			acres	2.31	.58	6.58							1.16				.12					
16	South Inlet	12.52	%	--	3	59	4	--		--	--	--	9	--			--		--			
			acres		.38	7.39	.50						1.13									
17	South Inlet	1.35	%	20	9	15	30						5									1
			acres	.27	.12	.20	.41						.07									.01
18	Barbours Hill	24.74	%	1	1	85	4			--	--		5	--			--	--	--			
			acres	.25	.25	21.03	.99						1.24									
19	Home Point	27.29	%	1	3	75	2	--	--	--	--		8	--	--			--	--			
			acres	.27	.82	20.47	.55						2.18									
20	Midway Inlet	4.03	%	4	3	55	10			1	1		3				--	2	--			
			acres	.16	.12	2.22	.40			.04	.04		.12					.08				

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
13		--	--	--	--				--	--		--	--			--		--	ff-	Extensive needlerush spit marsh complex	III
14		1		1	--					--			--			--				Large needlerush pocket marsh	III
		.04		.04																	
15		1	1	1	3					--			--			--			cc1	Road across pocket marsh. Needlerush above and big cordgrass below	III
		.12	.12	.12	.35														cc.12		
16		--	3	2	20					--		--				--			oo-, cc-, am-	Needlerush spit marsh	III
			.38	.25	2.50																
17					20															Mixed vegetation fringe marsh	XI
					.27																
18		1	--	--	3					--			--			--				Needlerush point marsh	III
		.25			.74																
19		1	--	--	10					--			--			--			am-	Needlerush point marsh	III
		.27			2.73																
20		1		--	20			--	--	--				--		--		--	f-, ss-	Broad fringe marsh and three small islands with fringes	III
		.04			.81																

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
21	Midway Inlet	13.13	%	7	20	40	--	--	--	--	--		10				--	--	--	--		
			acres	.92	2.63	5.25							1.31									
22	Barbours Hill WMA	71.72	%	--	17	40	--			--	--	--	7	--	--	--	--	23		--	10	--
			acres		12.19	28.69							5.02					16.50			7.17	
23	Barbours Hill WMA	57.15	%	--	5	1	1	--			--	--	25		2	--		21		10	30	
			acres		2.86	.57	.57						14.29		1.14			12.00		5.72	17.15	
24	Cedar Island	11.58	%	15	12		60				--	--	--	--	--		--			--		
			acres	1.74	1.39		6.95															
25	Cedar Island	.33	%	3	15								35	--		1	10		--	5		18
			acres	.01	.05								.12			--	.03			.02		.06
26	Cedar Island	10.59	%	8	10	5	20				1	--		--	--		--		--			1
			acres	.85	106	.53	2.12				.11											.11
27	Cedar Island	.50	%	--	65	3	--	2	1		1		--				--		--			
			acres		.33	.02		.01	.01		.01											
28	Cedar Island	.50	%	1	10				6		2	3	5				26					1
			acres	.01	.05				.03		.01	.02	.03				.13					.01

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
21		10		--	13				--	--			--			--	--	--	ff-, am-	Peninsula complex w/ broad fringe marshes & hummocks of pine & live oak	XI
		1.31			1.71																
22		--	--	--	3				--	--			--				--		o-, ff-, oo-, ww-, zz-, am-	Waterfowl impoundment managed for emergent vegetation	XI
					2.15																
23		5	--	--	--				--	--			--				--		ff-	Waterfowl impoundment managed for emergent vegetation	XI
		2.86																			
24		5	--														8			Cattail dominated pocket marsh with two small ponds	VI
		.58															.93				
25		--		--		--				--							13		am-	Small pocket marsh	XI
																	.04				
26		53		--	1												--		cc1, am-	High pocket marsh dominated by switchgrass	XI
		5.61			.11														cc.11		
27		23			5									--		--			u-, cc-, ff-	High pocket marsh dominated by saltmeadow hay	II
		.12			.03																
28		24		--	20							--		--	--		2		am-	Small spit marsh	XI
		.12			.10												.01				

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
29	Little Cedar Island	1.49	%		20		--	--			--	--	4				--	--		--	--	
			acres		.30								.06									
30	Little Cedar Island	1.32	%		66			2			7	--	7	--	--	--	--		4	2	--	--
			acres		.87			.03			.09		.09						.05	.03		
	Total Section I. Part B.	335.86	%																			
			acres	8.08	24.86	168.81	12.49	.04	.04	.04	.26	.02	29.04	.82	1.14		.28	29.40	4.16	5.77	24.32	.19
	Total Section I.	1188.31	%																			
			acres	68.78	62.22	492.06	323.92	.88	.04	1.08	18.26	.02	36.89	1.16	7.83	.02	.28	29.40	12.04	6.01	24.32	.61
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
29		15										--	1	--			60		cc-	High point marsh	XI
		.22											.01				.89				
30		7		--								--	--	1			4		u-	High point marsh	II
		.09												.01			.05				
T																					
		11.63	.50	.41	11.50								.01	.01			1.92		.23		
T																					
		28.41	17.80	.43	34.97			.54		.28			1.60	.01		8.46	5.29		4.85		

Section II

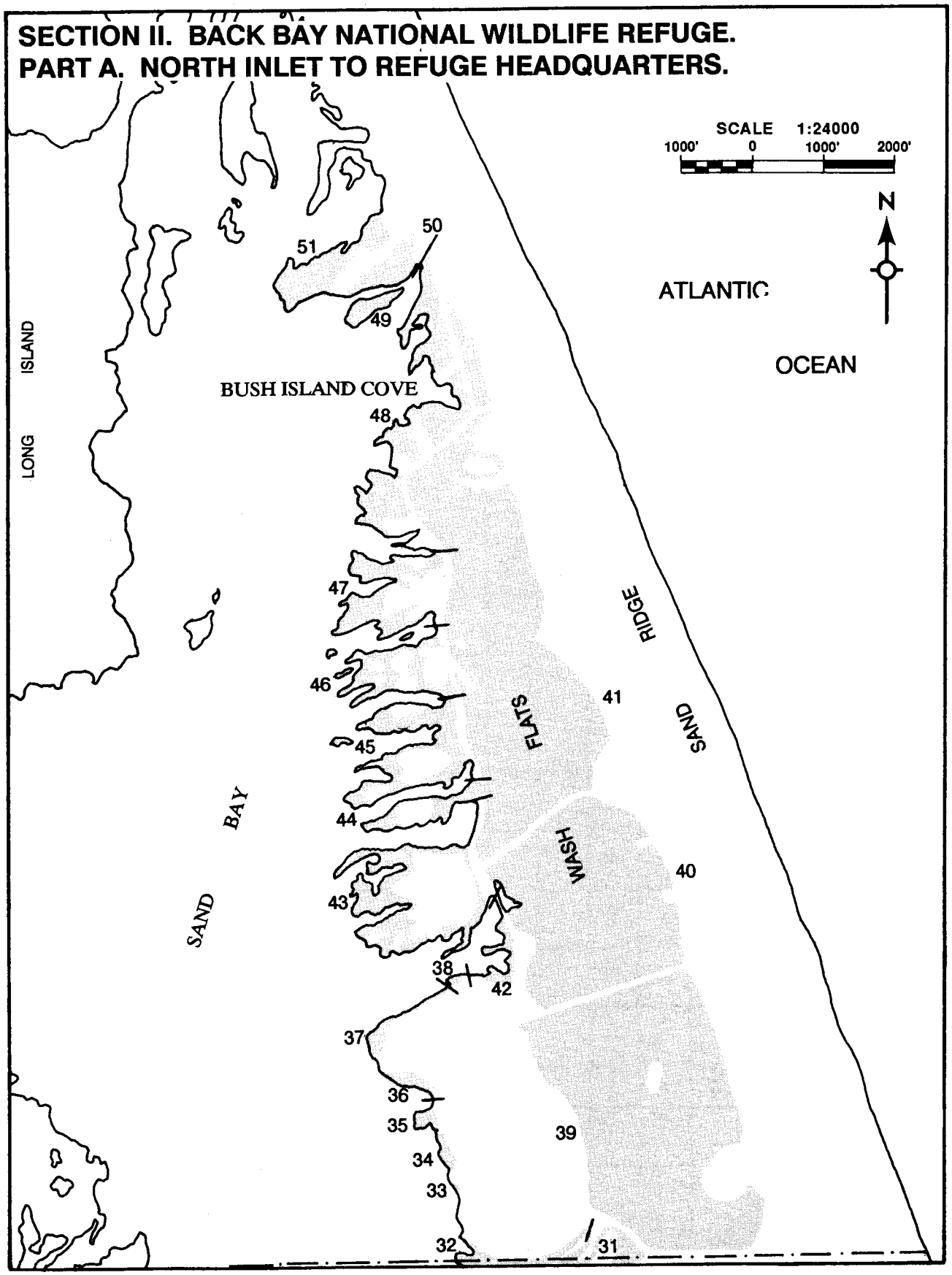
Back Bay National Wildlife Refuge

This section includes those wetlands included within the boundaries of the Back Bay National Wildlife Refuge. They include approximately 3000 acres of marsh which extends from the barrier spit below Sandbridge across Back Bay to the mainland. These wetlands are dominated by cattails, 988 acres, and black needlerush, 699 acres, with large areas of big cordgrass (213 acres) and saltmeadow grasses (241 acres).

Along the barrier spit are approximately 512 acres of moist soil impoundments that have been developed on the old overwash flats. They are drained in the spring to encourage emergent vegetation and flooded in the fall to provide enhanced wintering habitat for migratory waterfowl. Along the shoreline adjacent to the impoundments are a number of broad fringing marshes that have developed around the extremities of these old overwashes.

The majority of the rest of the marshes in this section, the Long Island and Ragged Island complexes, have developed on a geological formation known as the Sandridge-mudflat complex. It is composed of a series of relict beach ridges interspaced with lower lagoonal or mudflat deposits that formed during recent oscillations in sea level. The upland portion of Long Island is a part of the Knotts Island Ridge that once extended up to the vicinity of Sandbridge. In many instances these lagoonal deposits were comparatively low in elevation and supported very diverse wetland floras. Additionally, the coves within the Long Island and Ragged Island complexes as well as Sand Bay and its adjacent coves supported some of the most diverse and productive SAV beds observed during the inventory.

Populations of *Lilaeopsis carolinensis*, a state listed potentially endangered species were observed in marsh nos. 70, 71 and 77.


SECTION II. BACK BAY NATIONAL WILDLIFE REFUGE.
PART A. NORTH INLET TO REFUGE HEADQUARTERS.
SCALE 1:24000
1000' 0 1000' 2000'
N
ATLANTIC
OCEAN
LONG ISLAND
BUSH ISLAND COVE
BACK BAY
SAND
FLATS
WASH
RIDGE
SAND
50
51
49
48
47
46
45
44
43
38
42
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33
32
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39
31

Section II. Back Bay National Wildlife Refuge. Part A. North Inlet to Refuge Headquarters.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
31	North Inlet	7.35	%	--	5	69	15	--			--	--	--	--	--	--	--	5		5	--	
			acres		.37	5.07	1.10											.37		.37		
32	North Inlet	7.67	%	2	15	50	5	--	--	--	--	--	10		--	--	--	--	--	--		--
			acres	.15	1.15	3.84	.38						.77									
33	Sand Bay	.25	%		20	--							5				--			15		
			acres		.05								.01							.04		
34	Sand Bay	1.77	%	--	40	4	25						1		--	--	--		--	5		
			acres		.71	.07	.44						.02							.09		
35	Sand Bay	2.12	%	1	20	8	20	--		--	--		3		3	--	--	2	--	10		11
			acres	.02	.42	.17	.42						.06		.06			.04		.21		.23
36	Sand Bay	3.30	%	--	25	1	20			--	--		20		1	--	3			20		
			acres		.83	.03	.66						.66		.03		.10			.66		
37	Sand Bay	2.77	%	--	30	--	3	--					10		20				10	5		4
			acres		.83		.08						.28		.55				.28	.14		.11
38	Sand Bay	.75	%	5	5	60	--	--	--	--	--	--	5		--	--	2	--	--	--		--
			acres	.04	.04	.45							.04				.02					

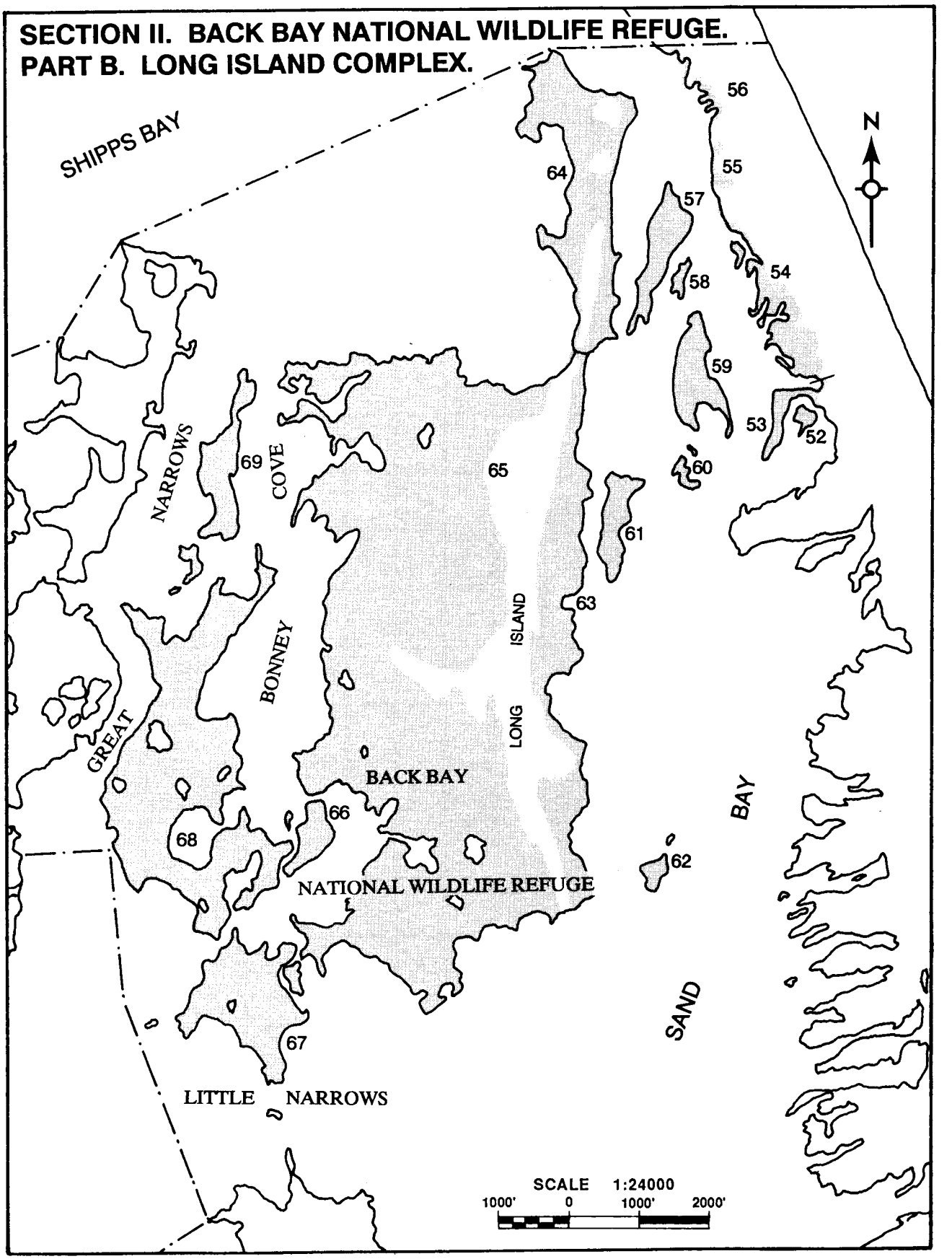
#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
31		--			--				--	--			--		--	--			o-, ff1, oo-, am-	Needlerush dominated pocket and fringe marsh	III
																			ff.07		
32		2	--	--	15	--			--	--			--			--	--	1	o-, ab-, am-	Broad fringe marsh	III
		.15			1.15													.08			
33		45			10											--			ab5	Small pocket marsh	XI
		.11			.03														ab.01		
34		10		--	1	--				1						1		2	d-, o-, ab10	Diverse pocket high marsh	XI
		.18			.02					.02						.02		.04	ab.18		
35		3		--	3	--			--	1	10					--	--	5		Diverse point marsh with small interior pond	XI
		.06			.06					.02	.21							.11			
36		10			--				--	--					--	--		--	o-	Broad fringe marsh	XI
		.33																			
37		10			8					--						--				Point marsh with adjacent fringe marsh	XI
		.28			.22																
38		10			10			--	--	--					--			3	ff-, l-, am-	Small pocket marsh	III
		.08			.08													.02			

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
39	Wash Flats	190.32	%		2	15	1	1		1	--	--	10		1		5			15	25	
			acres		3.81	28.55	1.90	1.90		1.90			19.03		1.90		9.52			28.55	47.58	
40	Wash Flats	129.53	%	--	5	12	13	1		--	--	--			--		1	--		20	41	--
			acres		6.48	15.54	16.84	1.30									1.30			25.91	53.11	
41	Wash Flats	191.95	%	--	--	52	25	1		--	--	--	1		2	--	--			10	4	1
			acres			99.81	47.99	1.92					1.92		3.84					19.20	7.68	1.92
42	Wash Flats	4.47	%	5	1	34	5	--		--	--		5		--		--	10	--	20		--
			acres	.22	.04	1.52	.22						.22					.45		.89		
43	Sand Bay	25.41	%	15	4	42	3	--		--	--	--	3	--	2		--	--	--	2		1
			acres	3.81	1.02	10.67	.76						.76		.51					.51		.25
44	Sand Bay	7.03	%	30	20	35	7	1		--			1	--	3		--	--		1		--
			acres	2.11	1.41	2.46	.49	.07					.07		.21					.07		
45	Sand Bay	21.98	%	36	12	47	2	--			--		--	--		--	--	--		--	--	
			acres	7.91	2.64	10.33	.44															
46	Sand Bay	14.87	%	45	3	50	--	--		--	--	--	--		--	--	--	--		--	--	
			acres	6.69	.45	7.44																

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
39			--	--		--	--	--	--			--	--		--				aj-, n-, ac-, yy11, xx3, o10	Waterfowl impoundment managed as an emergent wetland	XI
																			yy20.94, xx5.71, o19.03		
40		1	2	--		--	--								--		--	--	yy1, xx3, aj-, ae-, v-, o-	Waterfowl impoundment managed as an emergent wetland	XI
		1.30	2.59																yy1.30, xx3.89		
41	--	--	--	--		--	--	--		--	--	--	--		--	--	--		d-, yy1, ae-, l-, aa-, t-, xx2, v-,	o1 Waterfowl impoundment managed as an emergent wetland	III
																			yy1.92, xx3.84, o1.92		
42		10			10										--				oo-, ss-	Broad fringe marsh adjacent to road	XI
		.45			.45																
43		10	--		18			--	--	--			--			--	--		ff-, oo-	Overwash point with scattered upland hummocks	XI
		2.54			4.57																
44		2			--	--			--	--			--			--	--		ff-, oo-, ss-, am-	Overwash point with scattered upland hummocks	XI
		.14																			
45		3			--				--				--			--			ff-	Overwash point with scattered upland hummocks and small islands	XI
		.66																			
46		2	--		--		--	--	--	--			--		--	--			ff-	Overwash point with scattered upland hummocks and small islands	III
		.30																			

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
47	Sand Bay	18.66	%	40	3	50	--	--		--	--	--	--		2	--	--	--		--	--	--
			acres	7.46	.56	9.33									.37							
48	Bush Island Cove	45.46	%	41	2	52	2	--		--	--	--	--	--	--	--	--	--		--	--	--
			acres	18.64	.91	23.64	.91															
49	Bush Island	4.85	%	1	10	80	2			1	--	--	--	--	2	--	--	1	2		--	--
			acres	.05	.49	3.88	.10			.05					.10			.05	.10			
50	Bush Island Cove	12.20	%	5	20	20	38			1	--	--	--	--	1	--	--	10	2		--	--
			acres	.61	2.44	2.44	4.64			.12					.12			1.22	.24			
51	Bush Island Cove	15.84	%	4	40	13	35			--	--	--	--	--	--	--	--	8	--		--	--
			acres	.63	6.34	2.06	5.54											1.27				
	Total Section II. Part A.	708.55	%																			
			acres	48.34	30.99	227.30	82.91	5.19		2.07			23.84		7.69		10.94	3.40	.62	76.64	108.37	2.51
			%																			
			acres																			
			%																			
			acres																			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
47		4			1		--	--	--	--			--		--	--	--		o-, ff-, oo-, yy-, af-, j-, hh-, ag-,	ii-, gg- Overwash points with very diverse low marsh areas	III
		.75			.19																
48		2	--		--		--	--	--	--			--		--	1			ff-, oo-, af-	Overwash points with scattered upland hummocks	III
		.91														.45					
49		--	1				--		--			--			--	--			ff-, ss-	Needlerush dominated marsh island	III
			.05																		
50		--	3		--				--				--			--				Cattail dominated pocket marsh	VI
			.37																		
51	--	--					--	--	--				--		--	--	--		gg-	Cattail dominated point marsh	VI
T																					
		8.24	3.01		6.77					.04	.21					.47		.25	58.81		


SECTION II. BACK BAY NATIONAL WILDLIFE REFUGE.
PART B. LONG ISLAND COMPLEX.
SHIPPS BAY
N
56
55
64
57
54
58
59
53
52
60
65
69
NARROWS
COVE
61
63
ISLAND
LONG
BONNEY
GREAT
BACK BAY
66
68
62
BAY
NATIONAL WILDLIFE REFUGE
SAND
67
LITTLE NARROWS
SCALE 1:24000
1000' 0 1000' 2000'

Section II. Back Bay National Wildlife Refuge. Part B. Long Island Complex.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
52	Refuse Cove Island	2.01	%	--	12	75	5			--	--	--	1	--	1	--	--	5	1		--	--
			acres		.24	1.51	.10						.02		.02			.10	.02			
53	Sand Bay	7.31	%	1	10	86	--	--		--	--	--	--	--	2	--	--	1	--		--	
			acres	.07	.73	6.29									.15			.07				
54	Sand Bay	21.09	%	5	10	70	5	--		--	--	--	--	--	--	--	--	--	--		--	--
			acres	1.05	2.11	14.76	1.05															
55	Sand Bay	2.99	%	--	15	6	30		--		--	--	--		25			10	--			
			acres		.45	.18	.90								.75			.30				
56	Sand Bay	4.77	%	3	6	90	--	--		--	--		--		--	--	--	--				
			acres	.14	.29	4.29																
57	Sand Bay Island	17.33	%	20	15	40	10	--		--	--	--	--	--	1	--	--	14				--
			acres	3.47	2.60	6.93	1.73								.17			2.43				
58	Sand Bay	1.95	%	12	3	70	--			--	--	--	--	--	--	--	--	15				
			acres	.23	.06	1.37												.29				
59	Sand Bay	16.72	%	19	5	45	20	--		--	--	--	--	--	3	--	--	8				
			acres	3.18	.84	7.52	3.34								.50			1.34				

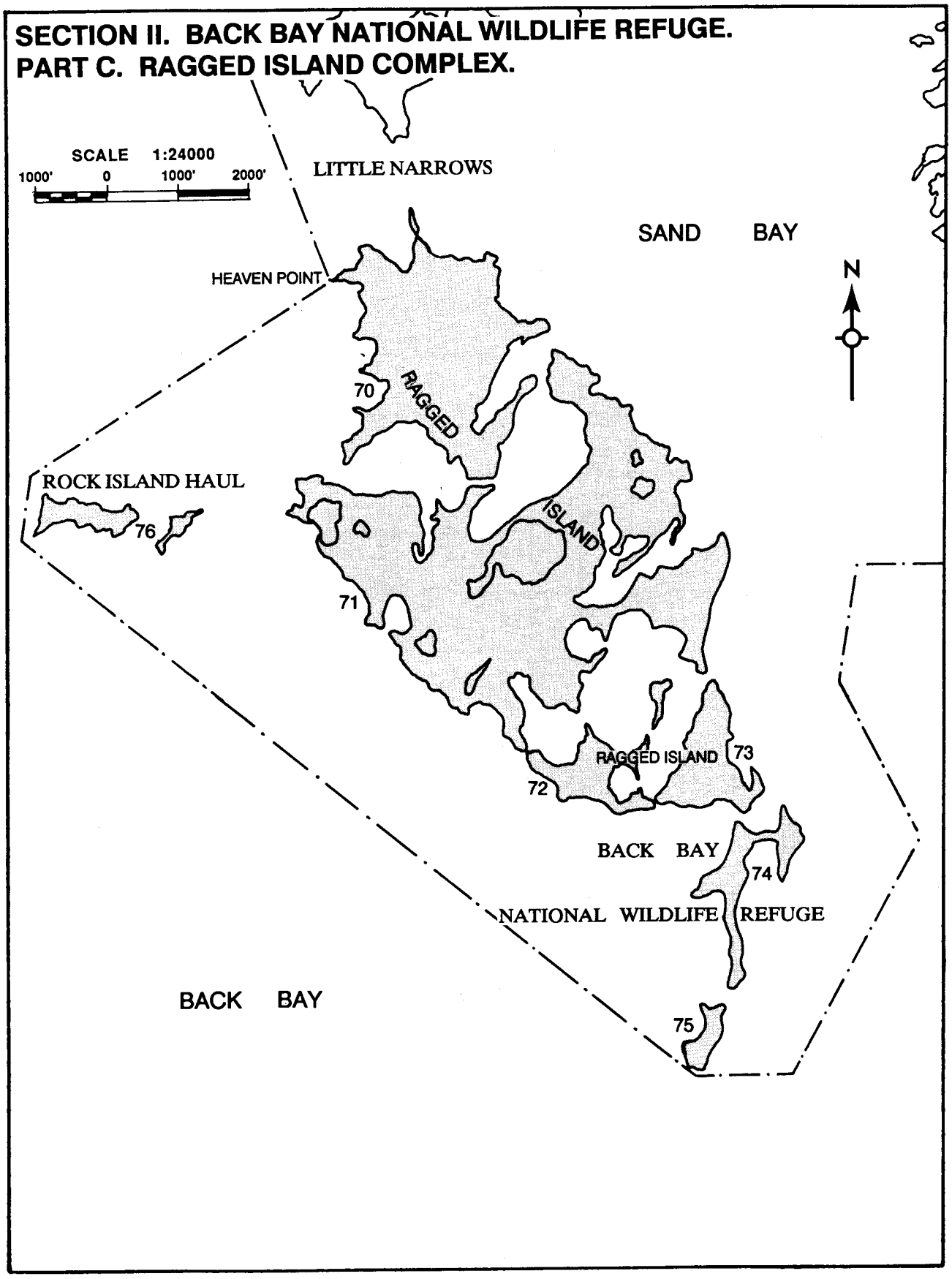
*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
52		--					--	--	--						--		--			Needlerush dominated marsh island	III
53		--			--		--	--	--	--		--	--			--	--		oo-	Needlerush dominated point marsh	III
54		--	10		--				--				--		--	--			aa-	Very broad fringing marsh	III
			2.11																		
55					1		--	--	--	--			--		--	--	1	10	aa2, ff-, ag-	Large pocket marsh dominated by cattails and spikerush	XI
					.03												.03	.30	aa.06		
56		--		--	1			--					--							Several small pocket and spit marshes	III
					.05																
57		--	--				--	--	--							--	--		ff-	Marsh island with a mixture of vegetation	XI
58		--		--					--							--				Small needlerush dominated island	III
59		--														--			oo-	Mixed vegetation marsh island	XI

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
60	Sand Bay	1.95	%	25	20	30	--			--	--	--	1	--	--	1	--	23				
			acres	.49	.39	.59							.02			.02		.45				
61	Sand Bay	12.07	%	2	3	90	--			--	--	--	1	--	2	--	--	2	--		--	--
			acres	.24	.36	10.86							.12		.24			.24				
62	Shell Point	2.63	%	17	28		35	--		--	1	--	--	--	--	1	--	17				
			acres	.45	.74		.92				.03					.03		.45				
63	Long Island	68.07	%	12	10	35	20	--		--	--	--	1	--	1	--	--	5	1	--		--
			acres	8.17	6.81	23.82	13.61						.68		.68			3.40	.68			
64	Long Island	61.64	%	13	20	45	5	--		--	--	--	14	1	--	--	--	1	--	--	--	
			acres	8.01	12.33	27.74	3.08						8.63	.62				.62				
65	Long Island	495.57	%	2	15	3	62	1	--	--	2	--	8	1	2	--	--	1	2			--
			acres	9.91	74.34	14.87	307.25	4.96			9.91		39.65	4.96	9.91			4.96	9.91			
66	Bonney Cove	9.30	%	6	6	3	42	--		--	1	5		7	6	1	1	6	16			
			acres	.56	.56	.28	3.91				.09	.47		.65	.56	.09	.09	.56	1.49			
67	Little Narrows	46.64	%	7	6	2	67	--		--	1	1	1	2	2	1	1	4	5			
			acres	3.26	2.80	.93	31.25				.47	.47	.47	.93	.93	.47	.47	1.87	2.33			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
60		--						--	--										ff-	Two small highly eroded islands	XI
61		--							--							--				Entirely needlerush except northeast corner of island	III
62							--	--	1							--			oo-	Mixed vegetation marsh island	XI
									.03												
63		15	--	--	--	--	--	--	--				--		--	--	--		d-, ak-, ff-, gg-, hh-	Eastern side of Long Island ridge	XI
		10.21																			
64		1		--	--		--	--	--	--		--	--		--	--	--		ff-, oo-	North end of Long Island	XI
		.62																			
65		1	--	--	--		--	--	--	--			--			--	--		o-,ak-,am-, ff-, oo-,gg-,n-,ss-	Major portion of Long Island. Very diverse vegetation	VI
		4.96																			
66		--		--			--	--	--	--							--			Two marsh islands	XI
67		--	--				--	--	--	--							--			Cattail dominated marsh islands	VI

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
68	Bonney Cove	140.95	%	14	8	3	30	1	--	--	1	4	3	5	5	4	4	5	8	--		--
			acres	19.73	11.28	4.23	42.29	1.41			1.41	5.64	4.23	7.05	7.05	5.64	5.64	7.05	11.28			
69	Bonney Cove	22.76	%	1	1	88	--	--		--	--	3	--	3	3	--	1	--	--	--		
			acres	.23	.23	20.03						.68		.68	.68		.23					
	Total Section II. Part B.	935.75	%																			
			acres	59.19	117.16	146.20	409.43	6.37			11.91	7.26	53.82	14.89	21.64	6.25	6.43	24.13	25.71			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

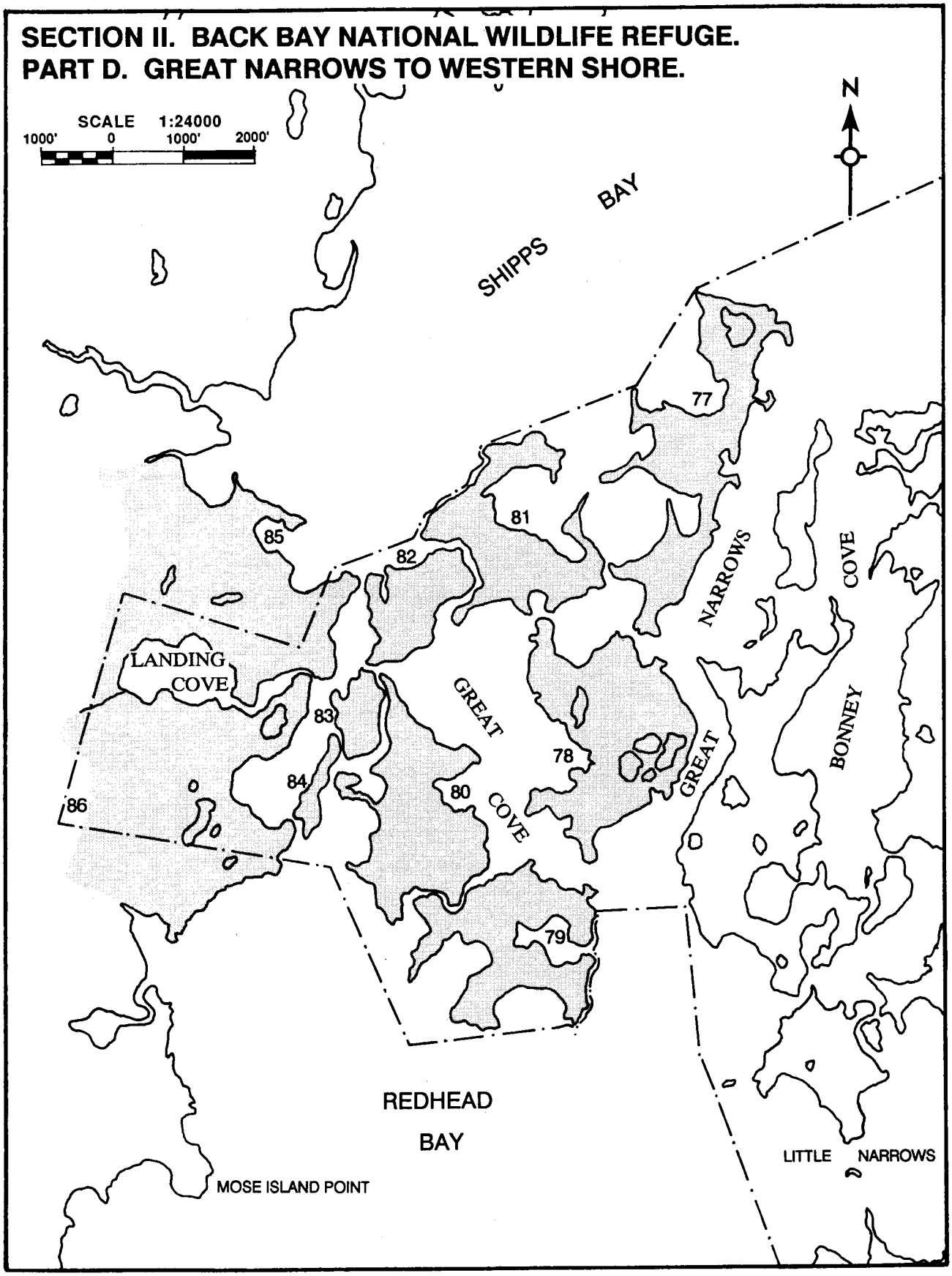
*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
68		1					2	--	--	--							1		n-, ak1	Very heterogeneous low marsh vegetation	XI
		1.41					2.82										1.41		ak1.41		
69		--					--	--	--											Needlerush dominated marsh island	III
T																					
		17.20	2.11		.08		2.82		.03								1.44	.30	1.47		


SECTION II. BACK BAY NATIONAL WILDLIFE REFUGE.
PART C. RAGGED ISLAND COMPLEX.
SCALE 1:24000
1000' 0 1000' 2000'
LITTLE NARROWS
SAND BAY
N
HEAVEN POINT
70
RAGGED
ISLAND
ROCK ISLAND HAUL
76
71
RAGGED ISLAND
73
72
BACK BAY
74
NATIONAL WILDLIFE REFUGE
BACK BAY
75

Section II. Back Bay National Wildlife Refuge. Part C. Ragged Island Complex.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
70	North Ragged Island	130.69	%	8	16	19	15	1		--	1	2	--	5	2	1	--	15	12	1		
			acres	10.46	20.91	24.83	19.60	1.31			1.31	2.61		6.53	2.61	1.31		19.60	15.68	1.31		
71	South Ragged Island	312.65	%	5	15	3	40	--		--	--	4	--	4	1	1	--	14	8	--		2
			acres	15.63	46.90	9.38	125.06					12.51		12.51	3.13	3.13		43.77	25.01			6.25
72	Ragged Island	22.86	%	10	15	--	41	1			2	1	1	7	1	--	1	15	--			
			acres	2.29	3.43		9.37	.23			.46	.23	.23	1.60	.23		.23	3.43				
73	Ragged Island	29.90	%	10	15	2	55	1			1	--	1	6	1	--	1	3	1	--	--	--
			acres	2.99	4.49	.60	16.45	.30			.30		.30	1.79	.30		.30	.90	.30			
74	Ragged Island	20.22	%	65	10	--	13	--			--	--	1	1	--	--	1	--		--		
			acres	13.14	2.02		2.63						.20	.20			.20					
75	Ragged Island	7.05	%	40	5		25	--		--	2		--	--	--	--	--		--	--		
			acres	2.82	.35		1.76				.14											
76	Rock Island Haul	14.86	%	4	9		59	6			--	3	7	--	2	5	2	1	--			
			acres	.59	1.34		8.77	.89				.45	1.04		.30	.74	.30	.15				
	Total Section II. Part C.	538.23	%																			
			acres	47.92	79.44	34.81	183.64	2.73			2.21	15.80	1.77	22.63	6.57	5.18	1.03	67.85	40.99	1.31		6.25

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
70		1		--			--	--	--								1		s-, ii-, n-	Large diverse marsh island	XI
		1.31															1.31				
71		1	1				--	--	--	--				--	--		--		o-, n-, ii-, ak1	Extremely large marsh island with numerous ponds and coves	XI
		3.13	3.13																ak3.13		
72		1	2	--			--	--	--			--					2		ii-	Marsh island	XI
		.23	.46														.46				
73		1		--	--		--	--	--				--	--			2		kk-	Marsh island with small area of upland	VI
		.30															.60				
74		2	6	--									--				1			Big cordgrass dominated marsh island	V
		.40	1.21														.20				
75		1	25	--			--	--	--			--	--				2		u-, am-, cc-	Small marsh island with large stand of common reed	XI
		.07	1.76														.14				
76		1	--				--							--			1			Marsh island experiencing severe erosion	VI
		.15															.15				
T																					
		5.59	6.56														2.86		3.13		


SECTION II. BACK BAY NATIONAL WILDLIFE REFUGE.
PART D. GREAT NARROWS TO WESTERN SHORE.
SCALE 1:24000
1000' 0 1000' 2000'
N
SHIPPS BAY
77
81
85
82
NARROWS
COVE
LANDING COVE
83
GREAT
78
84
80
COVE
GREAT
BONNEY
86
79
REDHEAD BAY
LITTLE NARROWS
MOSE ISLAND POINT

Section II. Back Bay National Wildlife Refuge. Part D. Great Narrows to Western Shore.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
77	Great Narrows	91.24	%	--	1	85	--	--			--	2	1	6	3	1	1		--			--
			acres		.91	77.55						1.82	.91	5.47	2.74	.91	.91					
78	Great Narrows	100.78	%	3	6	46	33			--	1	1	--	3	3	1	--	1	--			--
			acres	3.02	6.05	46.36	33.26				1.01	1.01		3.02	3.02	1.01		1.01				
79	Great Cove	70.78	%	7	4	43	30	--		--	--	1	1	1	10	1	1		--			1
			acres	4.95	2.83	30.44	21.23					.71	.71	.71	7.08	.71	.71					.71
80	Great Cove	78.41	%	2	2	20	64	1		--	--	--	--	--	10	1	--		--			
			acres	1.57	1.57	15.68	50.18	.78							7.84	.78						
81	Great Cove	62.83	%	4	1	74	1	1			--	--	--	2	2	--	--		15			
			acres	2.51	.63	46.49	.63	.63						1.26	1.26				9.42			
82	Great Cove	35.30	%	11	4	20	25	3			1	1	--	1	9	--	--		25			--
			acres	3.88	1.41	7.06	8.83	1.06			.35	.35		.35	3.18				8.83			
83	Great Cove	15.17	%	10	1	30	40	--		--	--		--	1	10	--	--		8		--	--
			acres	1.52	.15	4.55	6.07							.15	1.52				1.21			
84	Great Cove	8.03	%	72	1	5	15	1	--	--	1	--	1	1	2	--	--					--
			acres	5.78	.08	.40	1.20	.08			.08		.08	.08	.16							

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
77				--			--	--	--	--									ii-	Marsh heavily eroded	III
78		--	--	--			1	--	--								1			Dominated by needlerush relict marsh community	XI
							1.01										1.01				
79		--	--	--			--	--	--	--		--	--	--	--		--			North end dominated by needlerush relict saltmarshes	XI
80		--	--				--	--	--	--		--	--	--	--		--			Large marsh island dominated by cattails	VI
81				--			--	--												Marsh island dominated by needlerush	III
82		--					--	--	--	--										Diversely vegetated marsh island	XI
83		--					--	--	--	--		--		--	--					Marsh island dominated by big cordgrass	XI
84		--					--	1	--	--			--				--			Islands dominated by big cordgrass	
								.08													

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
85	Landing Cove	169.56	%	4	--	26	58	--	--	1	1	--	--	1	1	--	--		5			--
			acres	6.78		44.09	98.34			1.70	1.70			1.70	1.70				8.48			
86	Hill Landing	184.80	%	15	--	10	50	--	--	1	1	1	--	--	3	--	--		15	--		--
			acres	27.72		18.48	92.40			1.85	1.85	1.85			5.54				27.72			
	Total Section II. Part D.	816.90	%																			
			acres	57.73	13.63	291.10	312.14	2.55		3.55	4.99	5.74	1.70	12.74	34.04	3.41	1.62	1.01	55.66			.71
	Total Section II.	2999.43	%																			
			acres	213.18	241.22	699.41	988.12	16.84		5.62	19.11	28.80	81.13	50.26	69.94	14.84	20.02	96.39	122.98	77.95	108.37	9.47
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
85		--	3	--			--	--	--	--				--	--		--		r-, gg-, o-	Low marsh, relic shoreline vegetation	VI
			5.09																		
86		1	1	--			--	--	--	1	--			1	--		--		r-, o-	Large areas of low marsh around landing cove most s.cyn south half	VI
		1.85	1.85							1.85				1.85							
T																					
		1.85	6.94				1.01	.08		1.85				1.85			1.01				
T																					
		31.58	18.62		6.85		3.83	.08	.03	1.89	.21			1.85		.47	5.31	.55	64.71		

Section III

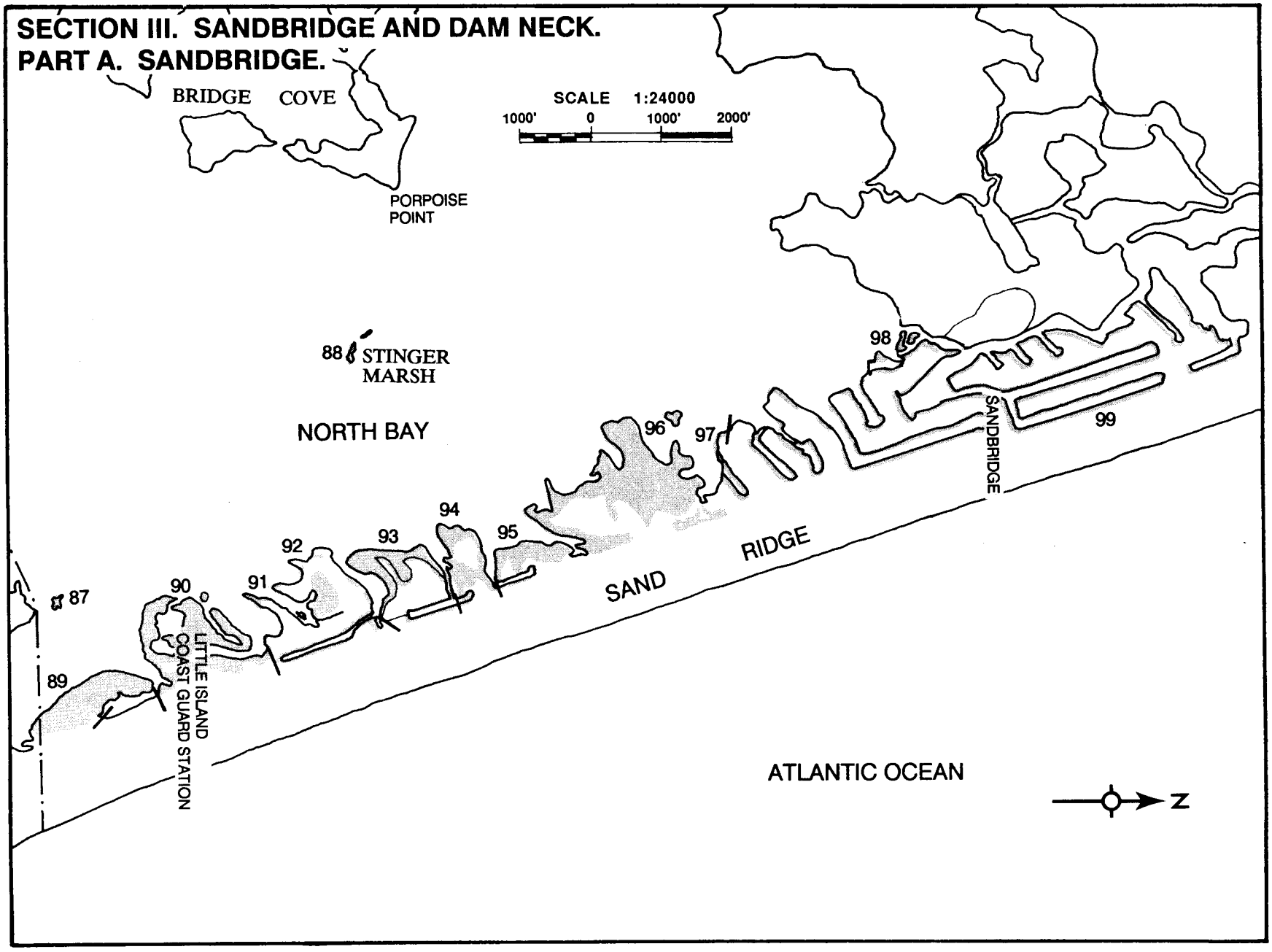
Sandbridge and Dam Neck

This section extends from the Back Bay National Wildlife Refuge north to roughly the head of the Back Bay watershed. It includes the marshes along the developed portion of the barrier spit, the large embayed marshes of North Bay and the more isolated wetlands of the headwaters. There are almost 1500 acres of marsh in this section that are, again, dominated by cattails, 545 acres, and black needlerush, 249 acres. Smartweeds (119), spikerush (97) and big cordgrass (90) also contribute significant areas to the acreage.

The wetlands along the bayside of Sandbridge have been severely impacted and diminished by extensive dredging and filling for the canal developments. Marsh number 101 has a dike around its perimeter but was only partially filled with dredged material.

The marshes numbered 100-110, known as the Sandbridge Marshes, make up a very important habitat complex within the Back Bay complex. This over 900 acre tract of marsh with excellent interspersion of open water, exceptionally diverse wetlands vegetation and submerged aquatic vegetation beds make it particularly important to migratory waterfowl.

Above the Sandbridge Marshes are several isolated wetlands and water bodies including Black Gut, Lake Tecumseh, Redwing Lake and Lovetts Marsh. They are relicts of the Sandridge-mudflat complex and are hydrologically connected to Back Bay through a complex system of drainage ditches and the channelized Hell Point Creek. These areas are the recipients of much of the stormwater runoff from a rapidly urbanizing Virginia Beach. The stormwater flowing through the natural wetlands has the benefit of the inherent filtering abilities of the wetlands while those discharged into Hell Point Creek receive little, if any, benefits before reaching Back Bay.


SECTION III. SANDBRIDGE AND DAM NECK.
PART A. SANDBRIDGE.
BRIDGE COVE
SCALE 1:24000
1000' 0 1000' 2000'
PORPOISE POINT
88 STINGER MARSH
NORTH BAY
98
99
SANDBRIDGE
96
97
94
95
92
93
91
90
87
89
SAND RIDGE
LITTLE ISLAND COAST GUARD STATION
ATLANTIC OCEAN
N

Section III. Sandbridge and Dam Neck. Part A. Sandbridge.

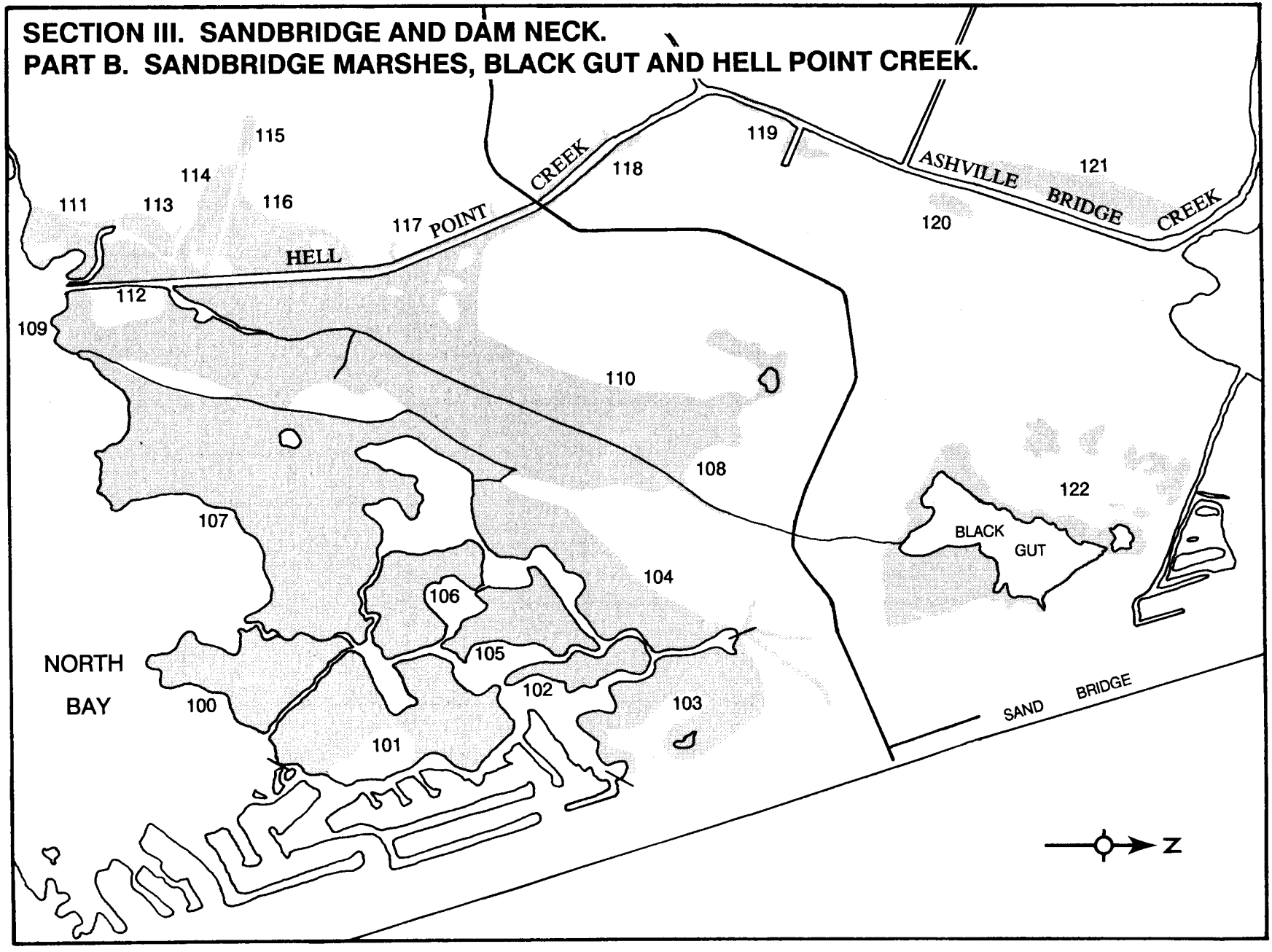
#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
87	Little Island Area	.25	%	10	32	1	2	--		--	--	2	1		13	5	--	30			--	
			acres	.03	.08	--	.01					.01	--		.03	.01		.08				
88	Stinger Marsh	.25	%		--		55	--		--	1	--	2	--	25	--	--				--	--
			acres				.14				--		.01		.06							
89	Sand Ridge	16.75	%	2	3	95	--	--		--	--	--	--		--	--	--	--	--			
			acres	.34	.50	15.91																
90	Little Island	25.97	%	6	3	89	1	--		--	--		--	--	--	--		--	--		--	
			acres	1.56	.78	23.11	.26															
91	Sand Ridge	.61	%	30	20	40	1			1		--			--	--	--	8		--		
			acres	.18	.12	.24	.01			.01								.05				
92	Sand Ridge	4.36	%	--	--	100	--			--	--	--	--		--	--						
			acres			4.36																
93	Sand Ridge	11.68	%	30	6	56	6	--		--	--	--	--	--	--	--	--	1	--		--	--
			acres	3.50	.70	6.54	.70											.12				
94	Sand Ridge	7.91	%	60	5	30	1	--		1	--	--	--	--	1	--	--	1	--		--	
			acres	4.75	.40	2.37	.08			.08					.08			.08				

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
87		2					--		1						1					Small marsh island	XI
		.01							--						--						
88		12					--	2	--	--			--		--		3			Small marsh island dominated by cattail	VI
		.03						.01									.01				
89		--	--	--	--		--	--	--				--		--					Dominated by needlerush relic saline marsh	III
90		--	1	--	--		--	--	--				--		--					Relic needlerush marsh	III
			.26																		
91				--	--								--			--				Small marshes reflecting former saline conditions	XI
92				--	--								--			--	--			Small marsh dominated by needlerush	III
93		--	--	--	1	--	--	--	--	--	--		--		--	--	--		ff-, s-	Relic needlerush marsh	III
					.12																
94		--	--	--	1	--		--	--		--		--		--	--	--		ff-	Dominated by big cordgrass	V
					.08																

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
95	Sand Ridge	7.59	%	64	5	30	--	--		--	--	--	--	--	1	--	--	--	--		--	
			acres	14.86	.38	2.28									.08							
96	North Bay	40.62	%	43	7	42	6	--	--	1	1	--	--	--	--	--	--	--	--		--	
			acres	17.47	2.84	17.06	2.44			.41	.41											
97	Sandbridge	.08	%	75	25											--						
			acres	.06	.02																	
98	Sandbridge	1.73	%	7	30		38	--		1	1	--			2	--	--				--	
			acres	.12	.52		.66			.02	.02				.03							
99	Sandbridge	.80	%	--	80	--	--	--		--		--				--	--			--		
			acres		.64																	
	Total Section III. Part A.	118.60	%																			
			acres	32.87	6.98	71.87	4.30			.52	.43	.01	.01		.28	.01		.33				
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
95		--		--	--		--	--	--				--		--		--		s-	A productive marsh dominated by big cordgrass	V
96		--	--	--	--	--	--	--	--				--		--	--	--		s-, bb-, ff-	Marsh dominated by needlerush and big cordgrass	XI
97					--								--						ff-	Fringe marsh dominated by big cordgrass	V
98		20					--		--	--						--			ii1	Small marsh islands	XI
		.35																	ii.02		
99		8	--	--	1				1				9				--		ff1	Discontinuous fringe marsh	II
		.06			.01				.01				.07						ff.01		
T																					
		.45	.26		.21			.01	.01				.07				.01		.03		

SECTION III. SANDBRIDGE AND DAM NECK.
PART B. SANDBRIDGE MARSHES, BLACK GUT AND HELL POINT CREEK.



Section III. Sandbridge and Dam Neck. Part B. Sandbridge Marshes, Black Gut and Hell Point Creek.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
100	Upper North Bay	50.92	%	20	3	--	52	7	--	6	1	--	1	1	8	--	--	--				
			acres	10.18	1.53		26.48	3.56		3.06	.51		.51	.51	4.07							
101	Upper North Bay	84.64	%	38	10	1	48	--	--	1	--	--	--	--	2		--	--	--	--		
			acres	32.16	8.46	.85	40.63			.85					1.69							
102	Upper North Bay	17.35	%	--		30	55	5	--	--	--	1	1	--	7	--	--	--				
			acres			5.21	9.54	.87				.17	.17		1.21							
103	Upper North Bay	53.80	%	--	--	45	25	--	6	8	--	--			--		--					
			acres			24.21	13.45		3.23	4.30												
104	Upper North Bay	71.90	%	--	1	49	35	6	6	--	--	--	--	1	1	1	--	--		--		--
			acres		.72	35.23	25.17	4.31	4.31					.72	.72	.72						
105	Upper North Bay	33.45	%	--	1	25	54	8	--	1	1	--	--	--	10	--	--	--	--	--		--
			acres		.33	8.36	18.06	2.68		.33	.33				3.35							
106	Upper North Bay	37.43	%	1	5	5	55	10	--	1	4	--	2	1	15	--	--	--	--	--		1
			acres	.37	1.87	1.87	20.59	3.74		.37	1.50		.75	.37	5.61							.37
107	Upper North Bay	223.22	%	2	10	1	64	5	--	1	--	2	2	1	6	1	--	1	3	--	--	--
			acres	4.46	22.32	2.23	142.86	11.16		2.23		4.46	4.46	2.23	13.39	2.23		2.23	6.70			

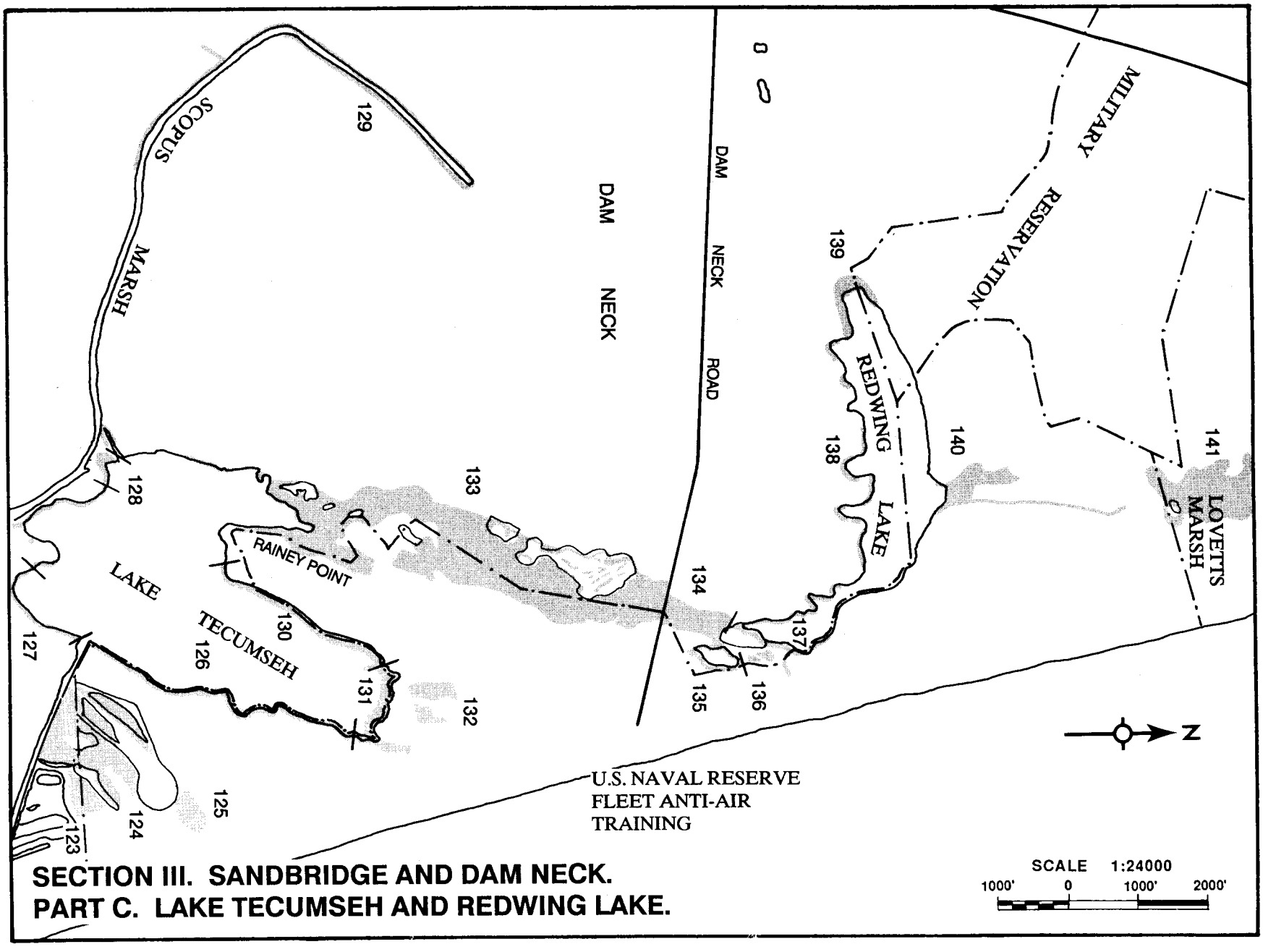
#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
100		1		--			--	--	--	--		--	--		--		--			Large marsh dominated by cattail	VI
		.51																			
101	--	--	--	--	--		--					--	--						am-	Large marsh dominated by cattail and big cordgrass	XI
102							--	--	--	1	--						--	--	gg-	Marsh island dominated by cattail	VI
										.17											
103		--	--		15	1			--				--							Embayed and fringing marsh	XI
					8.07	.54															
104		--	--		--	--	--	--	--	--	--	--			--				i-, n-	Large marsh dominated by black needlerush and cattail	XI
105		--	--		--		--	--	--	--	--			--	--		--			Low marsh dominated by cattail	VI
106		--	--				--	--	--	--							--		n-	Large areas of low marsh	VI
107		1	--				--	--		--			--		--		--	--	gg-	Extensive marsh dominated by cattail	VI
		2.23																			

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
108	Upper North Bay	78.02	%	--	--	40	45	3	3	3	1		--	--	3	--	--		--			
			acres			31.21	35.11	2.34	2.34	2.34	.78				2.34							
109	Upper North Bay	76.17	%	2	5	14	28	15	8	1	1	1	1	--	15	1	--	3	2		--	
			acres	1.52	3.81	10.66	21.33	11.43	6.09	.76	.76	.76	.76		11.43	.76		2.29	1.52			
110	Hell Point Creek	186.80	%	1	1	12	50	19	2	1	--	--	--	--	13	--	--	--	--	--	--	
			acres	1.87	1.87	22.42	93.40	35.49	3.74	1.87					24.28							
111	Hell Point Creek	14.03	%	50	3	--	12	15		--		--	1	1	5		--	--		--		12
			acres	7.02	.42		1.68	2.10					.14	.14	.70							1.68
112	Hell Point Creek	13.70	%		4	15	20	25	--	--	--	2	--	--	8	--	--	1	25			--
			acres		.55	2.06	2.74	3.43				.27			1.10			.14	3.43			
113	Hell Point Creek	7.59	%	--	10	15	40	22	--	--	--	--		--	11		--	1	1			
			acres		.76	1.14	3.04	1.67							.83			.08	.08			
114	Hell Point Creek	15.41	%		15	20	20	22	--	1	1	--	--	--	19	--		--				--
			acres		2.31	3.08	3.08	3.39		.15	.15				2.93							
115	Hell Point Creek	2.24	%			--	--	40	5	--	--		5		17							--
			acres					.90	.11				.11		.38							

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
108		--	--			--		--	--		--	--	2				--	--	f-, i-	Long narrow berm separating this marsh and #109	XI
													1.56								
109		3	--			--		--	--	--	--	--	--	--	--			--	e-, g-, b-, v-, jj-	Marsh with diverse vegetation	XI
		2.29																			
110	--	--	1		--	--	--	--	--	--	--	--	--	--	--	--		--	h-, i-, w-, l-, s-	Large marsh dominated by cattails	VI
			1.87																		
111		--						--	1		--								i-, w-, l-, y-	Marsh dominated by cattail	V
									.14												
112		--	--			--	--	--	--		--	--	--					--	g-, i-, j-, q-, w-, am-	Island center dominated by three square and smartweed	XI
113		--						--			--	--	--	--	--				k-	Marsh with diverse vegetation	XI
114		--	1			--	--	1		--	--	--	--		--			--	g-, i-, b-, w-, am-	Center part of marsh may have been cultivated in the past	XI
			.15					.15													
115		4						1			--	--				--		18	i10	Small marsh adjacent to farmland	XI
		.09						.02										.40	i.22		

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
116	Hell Point Creek	30.30	%	--	--	64	33	--		--	--			--	--							
			acres			19.39	10.00															
117	Hell Point Creek	.50	%		30	40	5															
			acres		.15	.20	.03															
118	Hell Point Creek	2.54	%			--	15	9	19	10			--		30		--					
			acres				.38	.23	.48	.25					.76							
119	Hell Point Creek	2.16	%			7	20	2	--	40					1	--	--				3	
			acres			.15	.43	.04		.86					.02						.06	
120	Hell Point Creek	3.60	%					5		90												
			acres					.18		3.24												
121	Ashville Bridge Creek	28.22	%			8	--	7	--	--			15		--	--	--					--
			acres			2.26		1.98					4.23									
122	Black Gut	78.23	%		--	5	30	8	5	5					16	--	--	--		20		5
			acres			3.91	23.47	6.26	3.91	3.91					12.52					15.65		3.91
	Total Section III. Part B.	1112.22	%																			
			acres	57.58	45.10	174.44	491.47	95.76	24.21	24.52	4.03	5.66	11.13	3.97	87.33	3.71		4.74	11.73	15.65	.06	5.96

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
116	--		3			--						--	--			--			l-	Dominated by black needlerush and cattail	III
			.91																		
117			25																	Marsh dominated by saline species	XI
			.13																		
118	--					1			1	--			--					15	f-, g-, r-, s-, x-, t-	Marsh interspersed with willows and wax myrtle	XI
						.03			.03									.38			
119								--		--			--			--		10	d1, e1, q10, w5, s-	Narrow, discontinuous fringe marsh	XI
																		.22	d.02, e.02, q.22, w.11		
120																2			g3, h-, v-	Marsh dominated by marsh hibiscus	XI
																.07			g.11		
121	34	--	8				--	--		--	--	--	--	--		--	--	25	d-, f-, g-, h-, i-, l-, r-, j-, q-, b-,	k-, v-, n-, am3 Diverse marsh	XI
	9.59		2.26															7.06	am.85		
122	--	--	--					--	1	1	1		2		--	--	--	--	d-, f-, i1, r-, q-, b-, o-, t-	Diversely vegetated marsh	XI
									.78	.78	.78		1.56						i.78		
T																					
	9.59	5.12	5.32		8.07	.57		.17	.95	.95	.78		3.12			.07		8.06	2.33		



SECTION III. SANDBRIDGE AND DAM NECK.
PART C. LAKE TECUMSEH AND REDWING LAKE.

Section III. Sandbridge and Dam Neck. Part C. Lake Tecumseh and Redwing Lake.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
123	Sandbridge Borrow Pits	5.79	%		15	--	20	1	--	3			--		2					--		
			acres		.87		1.16	.06		.17					.12							
124	Sandbridge Borrow Pits	29.62	%		3	--	75	1	--	10					11	--				--		
			acres		.89		22.22	.30		2.96					3.26							
125	Sandbridge Borrow Pits	3.60	%			30	5	20		--				5								
			acres			1.08	.18	.72						.18								
126	Lake Tecumseh	.52	%			--	--	15		10			22		--		--			23		--
			acres					.08		.05			.11							.12		
127	Lake Tecumseh	.26	%			1	5	10		--							5			40		
			acres			.00	.01	.03									.01			.10		
128	Lake Tecumseh	1.35	%			--	25	8		20			--	--	--					--		
			acres				.34	.11		.27												
129	Scopus Marsh	.47	%			--	--	65	--	--			15									
			acres					.31					.07									
130	Lake Tecumseh	.63	%					50	1	--			20				5			4		
			acres					.32	.01				.13				.03			.03		

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
123	--	2					1				--		50			3		--	e-, f3, g-, i-	Inactive borrow pits in marsh	IV
		.12					.06						2.90			.17			f.17		
124	--	--					--	--			--	--	--			--		--	d-, f-, h-	Scattered upland islands	VI
125	--	5																	g35	Relict marsh isolated by road + draining through culvert	XI
		.18																	g1.26		
126		15					--			--	--		--			10	--	5	d-, h-, a-, q-	Continuous fringe marsh	XI
		.08														.05		.03			
127		24	14				1									--			a-, p-	Fringe marsh	
		.06	.04				.00														
128		--									--		5			--		--	d-, e20, f-, h-, b20, k2, c-	High pocket marsh with willows	XI
													.07						e.27, b.27, k.03		
129		2	--	15			--					--							d-, j-, u3, v-	Discontinuous fringe marsh	XI
		.01		.07															u.01		
130		--									--	--				20			d-, g-	Continuous fringe marsh	XI
																.13					

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
131	Lake Tecumseh	1.31	%				45	20	5	2			10							15		--
			acres				.59	.26	.07	.03			.13							.20		
132	Lake Tecumseh	4.57	%			30	8			50					5							
			acres			1.37	.37			2.29					.23							
133	Dam Neck	117.08	%			--	9	7	25	40			--	--	3		--			--		--
			acres				10.54	8.20	29.27	46.83					3.51							
134	Dam Neck	8.24	%					25	--	30					--							
			acres					2.06		2.47												
135	Dam Neck	2.32	%		8	--	4	30	--	--					10					1		--
			acres		.19		.09	.70							.23					.02		
136	Dam Neck	.68	%		1	5	--	52		5					1					--		
			acres		.01	.03		.35		.03					.01							
137	Redwing Lake	1.87	%		5	--	2	40	2	15			1		15					15		
			acres		.09		.04	.75	.04	.28			.02		.28					.28		
138	Redwing Lake	.25	%					34	2	2					2							
			acres					.09	.01	.01					.01							

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
131	--	--									--	--			--	2		1	h-	Broad fringe marsh	XI
																.03		.01			
132	--				--		--						7							Very high marsh invaded by maples	XI
													.32								
133	--	--					--	--		--	--	--	1		--	--	--	13	d-, e-, f1, g1, h-, j-, b-, k-, l-,	m-, n-, o- Grades into cypress swamp to south	XI
													1.17					15.22	f1.17, g1.17		
134	2											--				30		11	f2, s-	Diverse marsh	XI
	.16															2.47		.91	f.16		
135	--	--								12	--	--	--		5			--	f-, h-, i-, q30, w-, b-, l-	Marsh/pond dominated by smartweed and lotus	XI
										.28					.12				q.70		
136	--	--									15							--	h1, i20, b-, k-, l-	Pond dominated by water lily and smartweed	XI
											.10								h.01, i.14		
137		1									--		--			2		2	f-, h-, j-	Fringe marsh	XI
		.02														.04		.04			
138		20														40				Fringe marsh	XI
		.05														.10					

*	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
139	Redwing Lake	4.68	%				--	70														
			acres					3.28														
140	Redwing Lake	7.21	%				81	5	5	5			1		3							--
			acres				5.84	.36	.36	.36			.07		.22							
141	Lovetts Marsh	25.51	%		30		30	20	--	5			5		5							
			acres		7.65		7.65	5.10		1.28			1.28		1.28							
	Total Section III. Part C.	215.96	%																			
			acres		9.70	2.48	49.03	23.08	29.76	57.03			1.81	.18	9.15		.04			.75		
	Total Section III.	1446.78	%																			
			acres	90.45	61.78	248.79	544.80	118.84	53.97	82.07	4.46	5.67	12.95	4.15	96.76	3.72	.04	5.07	11.73	16.40	.00	5.96
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
139																			g30	Fringe marsh	XI
																			g1.40		
140		--							--									--	e-, f-, g-, h-, r-	Low marsh dominated by cattail	VI
141	5		--		--														f-	Marsh with diverse vegetation	XI
	1.28																				
T																					
	1.44	.52	.04	.07			.06			.28	10		4.46		.12	2.99		16.21	6.76		
T																					
	11.03	6.09	5.62	.07	8.28	.57	.06	.18	.96	1.23	.88		7.65		.12	3.06	.01	24.27	9.12		

Section IV

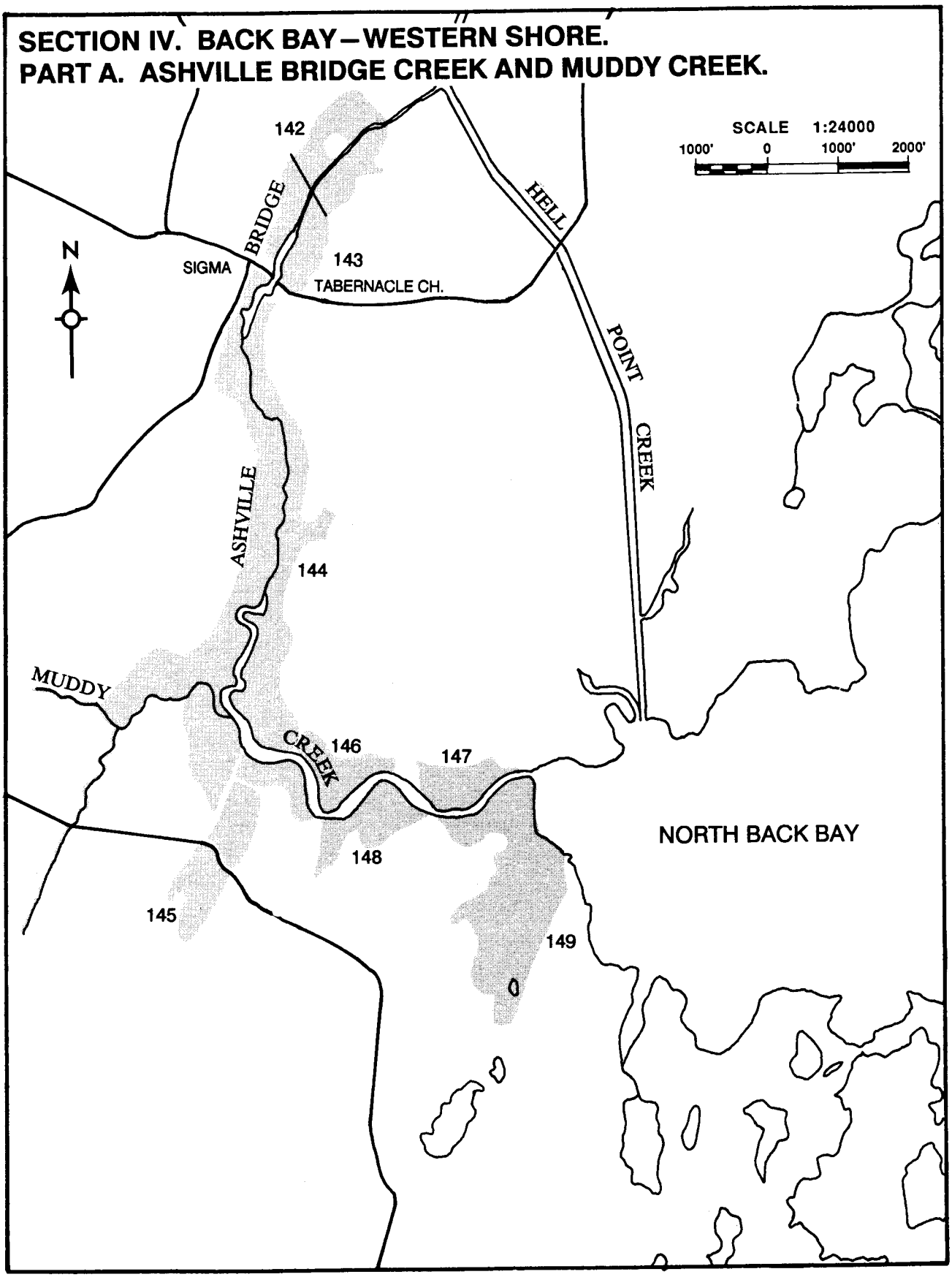
Back Bay – Western Shore

The marshes of this section are composed of the extensive marshes of the western bayshore as well as those of the major tributary streams, Asheville Bridge/Muddy Creek, Beggars Bridge Creek and Nawney Creek. There are approximately 2848 acres of marsh in this section which are dominated by cattails, 1420 acres, and black needlerush, 793 acres, with substantial areas of big cordgrass (148) and Olney threesquare (106). Many of these marshes are extremely complex floristically supporting as many as 28 different species in a relatively small area of habitat.

These marshes, particularly along the tributary streams, are important in the maintenance of water quality because of their role as a filter for upland runoff along the western shore. The buffer that these marshes provide between the upland development and the bay waters is critical to the long term health of the Bay.

During the inventory in 1977, the Asheville Bridge/Muddy Creek system supported an extensive stand of American lotus, *Nelumbo lutea*, which has since died out. The subsequent increases in the salinity of Back Bay probably contributed to their demise.

The majority of the marshes numbered 173, 174 and 175 make up the Trojan Waterfowl Management Area maintained by the Virginia Department of Game and Inland Fisheries.


SECTION IV. BACK BAY—WESTERN SHORE.
PART A. ASHVILLE BRIDGE CREEK AND MUDDY CREEK.
SCALE 1:24000
1000' 0 1000' 2000'
N
142
143
144
145
146
147
148
149
SIGMA
TABERNACLE CH.
BRIDGE
HELL
POINT
CREEK
ASHVILLE
MUDDY
CREEK
NORTH BACK BAY

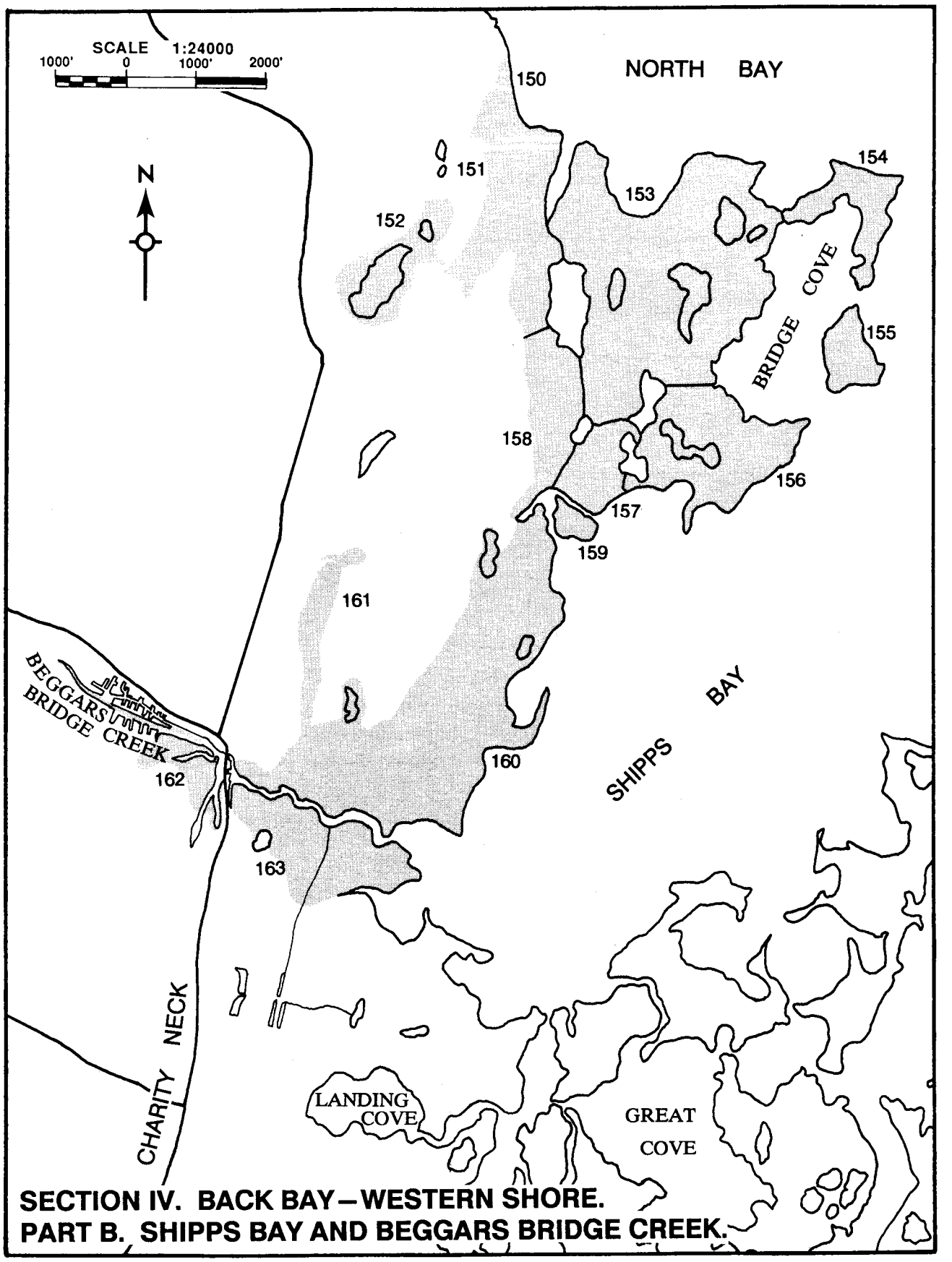
*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
142	1	--	--					--	--									10	f-, g2, h-, r-, k-, n-, s-	Northern & eastern sections succeeding to shrubs, willows & sweet gum	XI
	.32																	3.17	g.63		
143	6							--	--	--	--	--					--	1	f-, g-, h-, r-, q10, b-, am-	Creek marsh dominated by cattail	VI
	1.28																	.21	q2.13		
144	2		--			2		--	--	--	--	--		--	--		--	--	e-, f-, g3, h-, i-, s-, aa-, q1, b2,	w-, c-, dd-, a-, ee-, ai-, z-, x-, am- Lg. crk. marsh dom. by needlerush & cattail	XI
	3.20					3.20													g4.80, q1.60, b3.20		
145	--	--	--	--	--	--		--	--	--	--					--	--	1	f-, g1, i-, aa-, r-, w1, b-, x-, bb-	cc- Evidence of dredged material	III
																		.40	g.40, w.40		
146		1	3	--		1		--		--	--	--	--	--			--	--	e-, g1, s-, q3, w-, b-	Dredged canal, marsh dominated by needlerush	III
		.16	.47			.16													g.16, q.47		
147	--	--	--		1	--		--	--		--							--	f-, h-, i-, b-, z-, am-	Creek marsh dominated by needlerush	III
					.15																
148			2		--	--			--			--			--			--	g-, z-	Creek marsh dominated by cattail	VI
			.41																		
149			8		--	--					--							--	g-, i-, v-, bb-	Marsh dominated by cattail	VI
			5.88																		

Section IV. Back Bay - Western Shore. Part A. Ashville Bridge Creek and Muddy Creek.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
142	Ashville Bridge Creek	31.65	%				30	7	18	27			--		5							--
			acres				9.50	2.22	5.70	8.55					1.58							
143	Ashville Bridge Creek	21.28	%			--	75	2	4	2			--		--							--
			acres				15.96	.43	.85	.43												
144	Ashville Bridge Creek	160.11	%	--	--	40	44	1	2	2	--		--	--	1		--	--				--
			acres			64.04	70.45	1.60	3.20	3.20					1.60							
145	Muddy Creek	39.67	%	--	--	65	20	1	6	5	--		--		--		--					
			acres			25.79	7.93	.40	2.38	1.98												
146	Muddy Creek	15.66	%		1	65	22	--	2	1	--	--	--	--	--		--	--		--		
			acres		.16	10.18	3.45		.31	.16												
147	Muddy Creek	14.71	%	--	--	55	42	--	1	--		--	--	--	1		--	--				--
			acres			8.09	6.18		.15						.15							
148	Muddy Creek	20.63	%	2	--	23	60	1	1	1	--	--		--	--	--	--		10			--
			acres	.41		4.74	12.38	.21	.21	.21									2.06			
149	Muddy Creek	73.50	%	12	--	5	62	3	--	--	4		--	1	--		--		5	--		--
			acres	8.82		3.68	45.57	2.21			2.94			.74					3.68			

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
	Total Section IV. Part A.	377.21	%																			
			acres	9.23	.16	116.52	171.42	7.07	12.80	14.53	2.94			.74	3.33				5.74			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
T	4.80	7.66	5.97			.59								.52			2.46		5.70		



SECTION IV. BACK BAY—WESTERN SHORE.
PART B. SHIPPS BAY AND BEGGARS BRIDGE CREEK.

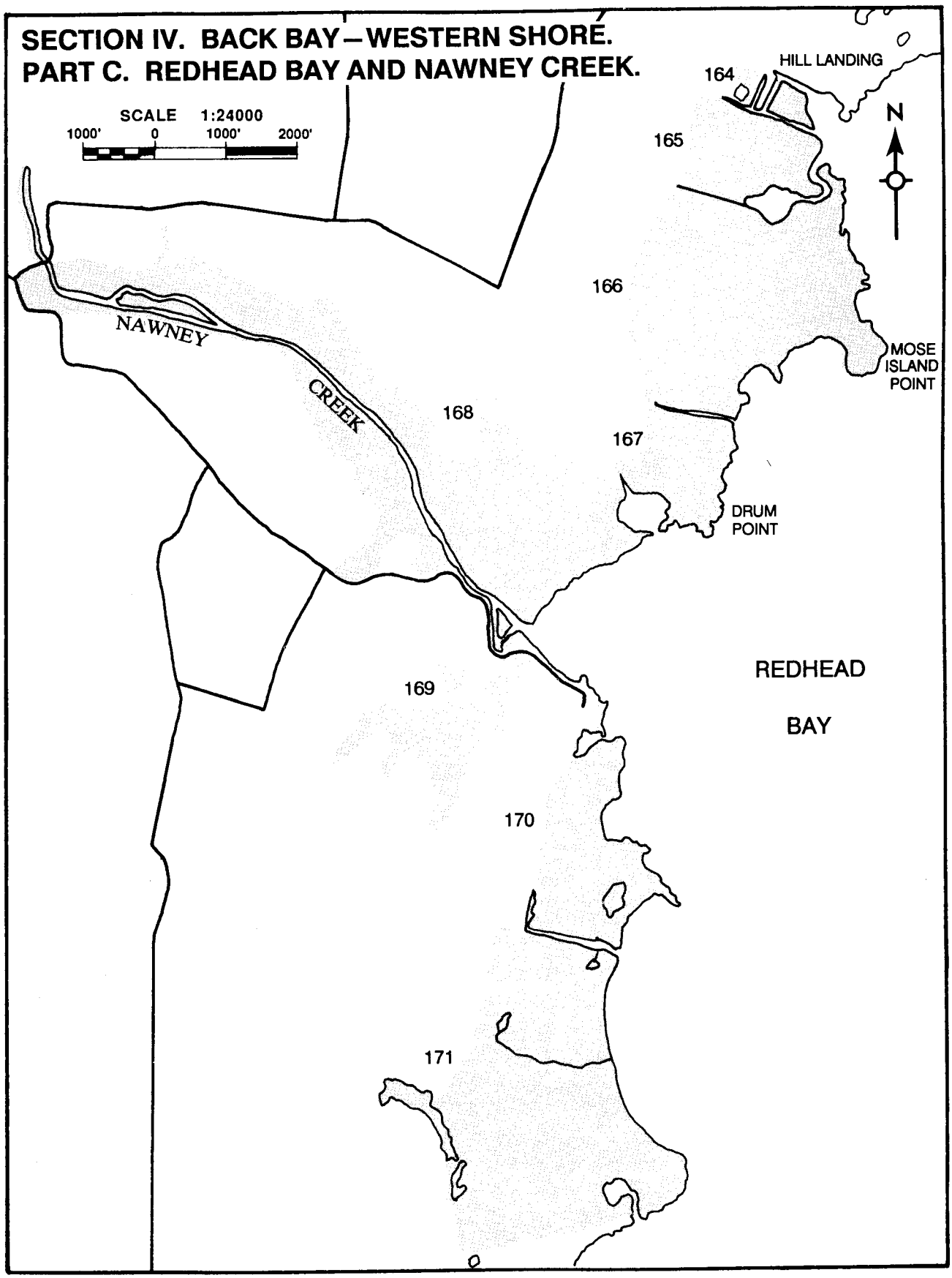
Section IV. Back Bay - Western Shore. Part B. Shipps Bay and Beggars Bridge Creek.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
150	Bridge Cove Area	12.99	%	35	2	--	30	--	--	--	6		--	--	--	--	--					--
			acres	4.55	.26		3.90				.78											
151	Bridge Cove Area	61.66	%	10	--	45	40	--	--		1	--	--	1	--		--			--		--
			acres	6.17		27.75	24.66				.62			.62								
152	Bridge Cove Area	30.83	%		--		94	--	--	5			--		--		--					--
			acres				28.98			1.54												
153	Bridge Cove	191.61	%	20	2	18	40	2		1	2	--	--	--	2	--	--	--	13		--	--
			acres	38.32	3.83	34.49	76.64	3.83		1.92	3.83				3.83				24.91			
154	Bridge Cove	25.58	%	40	4	2	25	10		3	3	1	3	1	5	--	1	--	--		--	
			acres	10.23	1.02	.51	6.40	2.56		.77	.77	.26	.77	.26	1.28		.26					
155	Bridge Cove	15.72	%	10	6	30	30	10		2	2	1	2	--	6	--	1		--			
			acres	1.57	.94	4.72	4.72	1.57		.31	.31	.16	.31		.94		.16					
156	Bridge Cove	67.63	%	6	8	25	35	5		1	2	4	1	--	1	1	--	--	10			--
			acres	4.06	5.41	16.91	23.67	3.38		.68	1.35	2.71	.68		.68	.68			6.76			
157	Shipps Bay	22.85	%	5	5	40	13	5	--	--	--	1	1	1	10	3	--	3	12	--		--
			acres	1.14	1.14	9.14	2.97	1.14				.23	.23	.23	2.29	.69		.69	2.74			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
150		25	2					--		--	--	--	--			--	--	--		Mixture of high and low marsh plants	XI
		3.25	.26																		
151		--	3			--	--	--				--	--		--	--	--	--	f-, h-, n-, b-, k-, am-	Marsh dominated by needlerush and cattail	XI
			1.85																		
152	--		1			--		--		--	--		--			--	--	--	i-, b-	Low, embayed marsh dominated by cattail	VI
			.31																		
153		--	--				--	--	--	--	--		--		--		--		j-, r-	Large marsh, diverse vegetation	XI
154		2					--	--					--		--		--		r-	Diverse vegetation	XI
		.51																			
155		--	--				--	--	--								--			Fringe of fleabane, sedges and wild millet	XI
156		--					1	--		--			--		--		--		am-	Diverse vegetation	XI
							.68														
157		--	--				--	--	--						--		1		b-, r-	Pond with diverse submerged aquatic vegetation	XI
																	.23				

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
158	Shipps Bay	36.24	%	--	--	20	25	1	--		--	--	--	--	5	5	1	--	40			--
			acres			7.25	9.06	.36							1.81	1.81	.36		14.50			
159	Shipps Bay	6.25	%	4	2	65	--	1	--	--	1	--	1	--	2	--	1	5	17			
			acres	.25	.13	4.06		.06			.06		.06		.13		.06	.31	1.06			
160	Shipps Bay	191.78	%	--	2	44	45	--	1	1	1	--	1	1	--	--	--	--	2		--	
			acres		3.84	84.38	86.30		1.92	1.92	1.92		1.92	1.92					3.84			
161	Beggars Bridge	19.56	%		--	--	30	30	2	15	--		5	--	10	--	3					2
			acres				5.87	5.87	.39	2.93			.98		1.96		.59					.39
162	Beggars Bridge Creek	13.23	%	1	1	59	29	--	2	2	--		--	1	--	--	--					
			acres	.13	.13	7.81	3.84		.26	.26				.13								
163	Beggars Bridge Creek	53.14	%	3	1	45	43	--	1	1	2	--	1	--	--	--	--		--			
			acres	1.59	.53	23.91	22.85		.53	.53	1.06		.53									
	Total Section IV. Part B.	749.07	%																			
			acres	68.01	17.23	220.93	299.86	18.77	3.10	10.86	10.70	3.36	5.48	3.16	12.92	3.18	1.43	1.00	53.81			.39
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
158			3			--	--	--				--			--		--		l-	Marsh dominated by three square, needlerush and cattail	XI
			1.09																		
159		--	--			--	--			--			--				1		dd-	Marsh dominated by needlerush	III
																	.06				
160	--	--	2	--		--	--	--						--	--		--		i-, aa-, r-, b-	Creek with diverse submerged aquatic vegetation	XI
			3.84																		
161	--					--			1	--	--			--	--			1	i1, aa-, r-, z-	Creek with abundant algae, duckweed and water lily	XI
									.20									.20	i.20		
162	1	2	--		1	--		--	--	--	--		1			--	--	--	i-, aa-, l-, z-, a-, ee-, o-, ff-	Marsh dominated by needlerush	III
	.13	.26			.13								.13								
163			3			--	--	--	--				--	--	--				z-	Marsh dominated by needlerush and cattail	XI
			1.59																		
T																					
	.13	4.02	8.94		.13		.68		.20				.13				.29	.20	.20		


SECTION IV. BACK BAY—WESTERN SHORE.
PART C. REDHEAD BAY AND NAWNEY CREEK.
SCALE 1:24000
1000' 0 1000' 2000'
HILL LANDING
164
165
166
N
NAWNEY
CREEK
168
MOSE
ISLAND
POINT
167
DRUM
POINT
REDHEAD
BAY
169
170
171

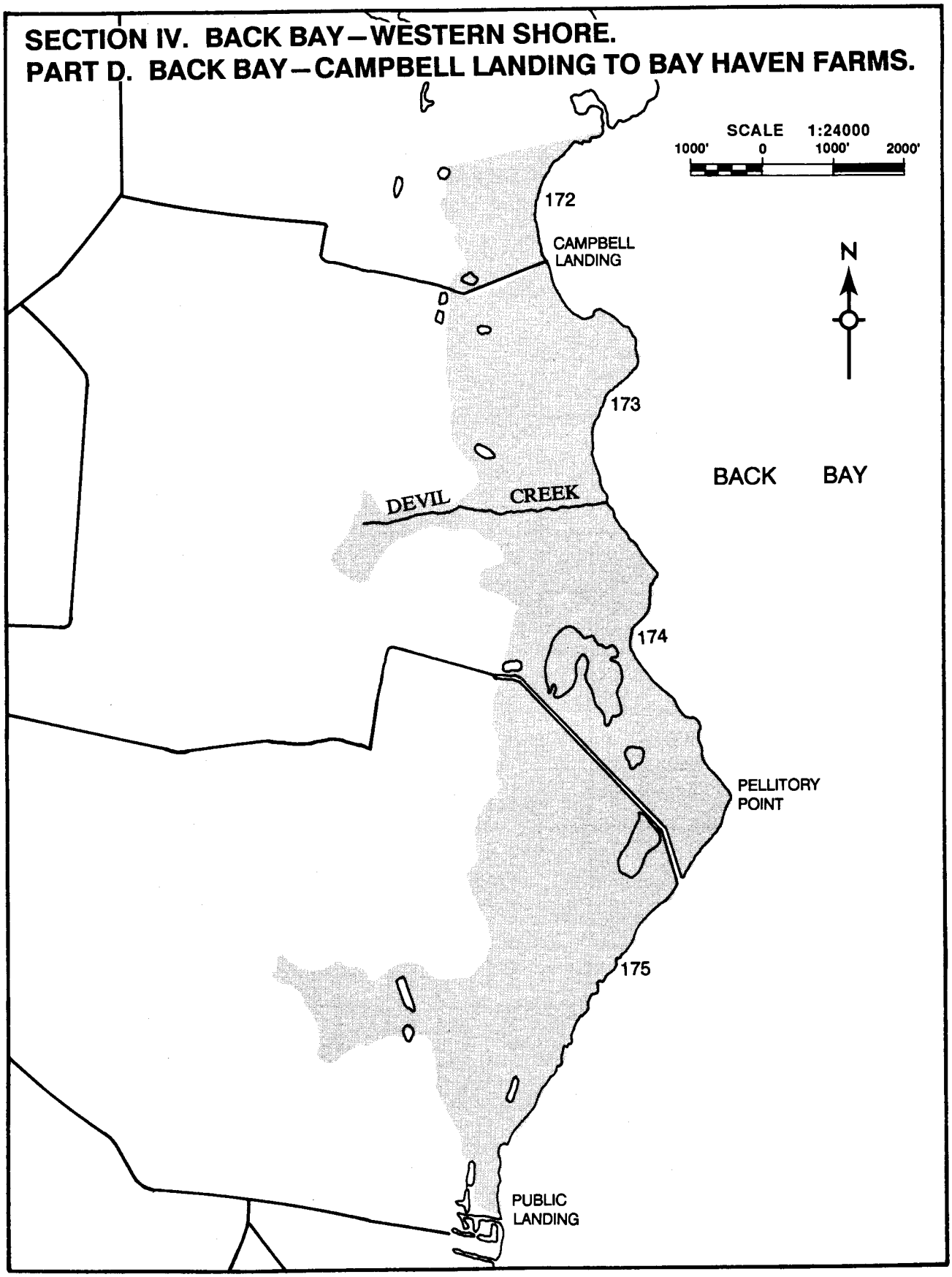
Section IV. Back Bay - Western Shore. Part C. Redhead Bay and Nawney Creek.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
164	Hill Landing	9.20	%	19	5	50	25	--	--	--	--	--	--	--	--	--	--		--			--
			acres	1.75	.46	4.60	2.30															
165	South Hill's Landing	51.87	%	1	2	41	45	--		1	2	--	--	--	2	--	--	--	3			--
			acres	.52	1.04	21.27	23.34			.52	1.04				1.04				1.56			
166	Mosels Point	189.68	%	2	2	27	56	--		1	1	--	1	1	2	--	--	--	3			1
			acres	3.79	3.79	51.21	106.22			1.90	1.90		1.90	1.90	3.79				5.69			1.90
167	Drum Point	44.77	%	2	1	60	24	1		1	3	--	1	1	2	--	--	--	2			--
			acres	.90	.45	26.86	10.74	.45		.45	1.34		.45	.45	.90				.90			
168	Nawney Creek	280.92	%	1	1	34	53	1	--	3	1	--	--	--	2	--	--	--	1	--	--	
			acres	2.81	2.81	95.51	148.89	2.81		8.43	2.81				5.62				2.81			
169	Nawney Creek	59.43	%	--	5	56	28	--	1	3	1		--	--	1	--	--	--		--	--	--
			acres		2.97	33.28	16.64		.59	1.78	.59				.59							
170	Redhead Bay	80.84	%	2	1	41	36	--		1	4	--	2	1	--	--	--	--	11		--	--
			acres	1.62	.81	33.14	29.10			.81	3.23		1.62	.81					8.89			
171	Redhead Bay	246.37	%	5	1	25	43	1		--	1	--	8	5	1	2	--	--	7	--	--	--
			acres	12.32	2.46	61.59	105.94	2.46			2.46		19.71	12.32	2.46	4.93			17.25			

*	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
164		1	--				--	--	--	--	--		--	--					i-, o-, am-	Island with dredged channels on three sides	III
		.09																			
165		1	--	--		--	--	--	--	--			--	1	--	--	--		i-, aa-, o1, oo-, am-	Marsh dominated by needlerush and cattails	XI
		.52												.52					o.52		
166		2	1				--	--	--		--		--	--		--	--		o-, ff-, ak-, am-	Large marsh dominated by cattails	XI
		3.79	1.90																		
167		1	1				--	--	--	--			--	--			--		oo-	Marsh dominated by needlerush	III
		.45	.45																		
168	--	1	1		--	--	--	--	--	--		--	--	--		--	--	--	f-, g-, aa-, o-, ff-, oo-, dd-,	b1, s-, cc-, qq-, rr-, a-, m-, ak- Lg. creek marsh dom. by cattails & needlerush	VI
		2.81	2.81																b2.81		
169	--	--	--		--	1	--	--	--			--	--	--					f2, g-, o-, aa1, n-, bb-, oo-, a-,	l1, al- Embayed marsh dominated by needlerush and cattails	III
						.59													f1.19, aa.59, l.59		
170		--	1	--			--	--					--			--	--		o-, ff-, tt-, bb-, oo-, ss-, am-	Marsh dominated by needlerush and cattails	XI
			.81																		
171		--	--	--	--		--	--	--	--		--	--	--		--	1	--	d-, o-, ff-, oo-, ss-, ak-, am-	Large marsh dominated by cattail and needlerush	XI
																	2.46				

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
	Total Section IV. Part C.	963.08	%																			
			acres	23.71	14.79	327.46	443.17	5.72	.59	13.89	13.37		23.68	15.48	14.40	4.93			37.10			1.90
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
T																					
		.16	6.76		.15	3.36												3.78	13.79		


SECTION IV. BACK BAY—WESTERN SHORE.
PART D. BACK BAY—CAMPBELL LANDING TO BAY HAVEN FARMS.
SCALE 1:24000
1000' 0 1000' 2000'
N
172
CAMPBELL LANDING
173
BACK BAY
DEVIL CREEK
174
PELLITORY POINT
175
PUBLIC LANDING

Section IV. Back Bay - Western Shore. Part D. Back Bay - Campbell Landing to Bay Haven Farms.

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
172	Campbell Landing	54.68	%	2	2	75	13	--		--	5		--	1	--	--	--	--	1	--		--
			acres	1.09	1.09	41.01	7.11				2.73			.55					.55			
173	Devil Creek	165.00	%	4	1	18	70	--		--	2	--	--	2	--	--	--		2			
			acres	6.60	1.65	29.70	115.50				3.30			3.30					3.30			
174	Pellitory Point	208.70	%	6	3	15	65	--	--	4	2	--	2		1	--	--		1			
			acres	12.52	6.26	31.31	135.66			8.35	4.17		4.17		2.09				2.09			
175	Pellitory Point	330.21	%	8	1	8	75	--	--	--	3	--	--	--	1	--	--	--	1			
			acres	26.42	3.30	26.42	247.66				9.91				3.30				3.30			
	Total Section IV. Part D.	758.59	%																			
			acres	46.63	12.30	128.44	505.93			8.35	20.11		4.17	3.85	5.39				9.24			
	Total Section IV.	2847.95	%																			
			acres	147.58	44.48	793.35	1420.38	31.56	16.49	47.63	47.12	3.36	33.33	23.23	36.04	8.11	1.43	1.00	105.89			2.29
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
172		1	--	--			--	--	--	--			--	--		--	--		d-, i-, o-, ff-, ss-, am-	Dredge channel, black needlerush marsh. Trojan Waterfowl M.A.	III
		.55																			
173		--	1	--			--	--					--			--	--		f-, oo-	Marsh dominated by cattails. Trojan Waterfowl M.A.	VI
			1.65																		
174		--	1	--	--		--	--	--	--			--			--	--		f-, o-, oo-, ak-, am-	Large cattail marsh with large pond	VI
			2.09																		
175		--	2	--	--			1		--		--	--			--	--		d-, f-, o-, ff-, ss-, oo-, uu-,	cc-, am- Large cattail marsh with ponds. Trojan Waterfowl M.A.	VI
			6.60					3.30													
T																					
		.55	10.34					3.30													
T																					
	4.93	12.39	32.01		.28	3.95	.68	3.30	.20				.13	.52			2.75	3.98	19.69		

Section V

Southern Back Bay

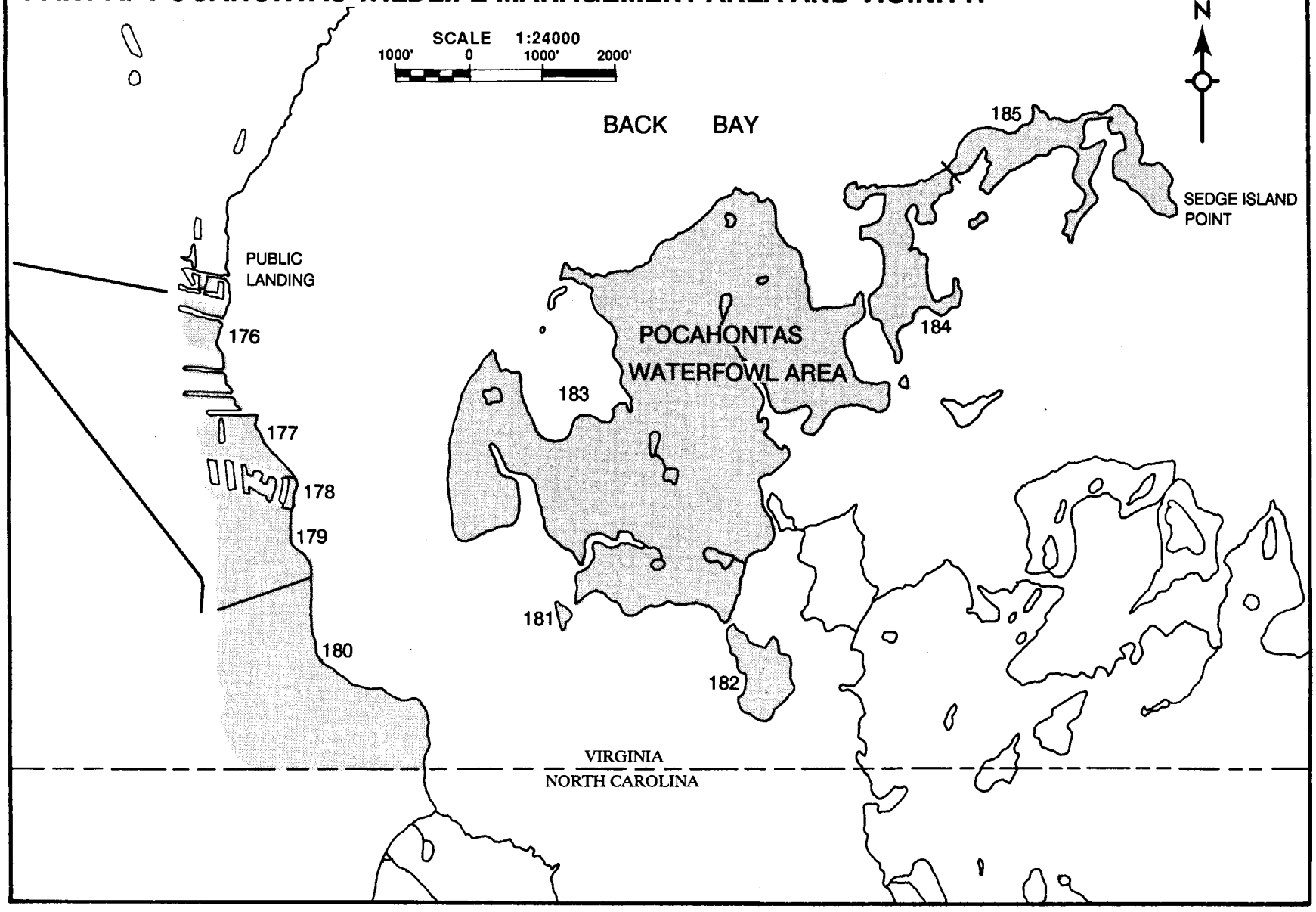
This section contains the last 166 acres of the western bayshore marshes; portions of which have been impacted by dredging and filling in the past. Typically, these marshes are dominated by cattails, black needlerush and big cordgrass.

Offshore is the Pocahontas Waterfowl Area which is managed as a public waterfowl hunting area by the Virginia Department of Game and Inland Fisheries. It consists of a number of marsh islands totalling over 500 acres. The vegetation is dominated by cattails and switchgrass.

Immediately adjacent to the Pocahontas Waterfowl Area is the Virginia portion of the Mackay Island National Wildlife Refuge. The majority of the Refuge is located across the border in North Carolina. The Virginia portion consists of a number of marsh islands, some supporting stands of trees, and a large section of marsh west of Knotts Island. The area encompassed totals 724 acres of predominately cattail and black needlerush with a large number of associated species.

The total marsh area for this section is approximately 1442 acres. Cattails, 727 acres, and switchgrass, 345 acres, dominated the cover with sizeable complements of black needlerush (137) and big cordgrasss (85).

SECTION V. SOUTHERN BACK BAY.
PART A. POCAHONTAS WILDLIFE MANAGEMENT AREA AND VICINITY.



Section V. Southern Back Bay. Part A. Pocahontas Wildlife Management Area and Vicinity.

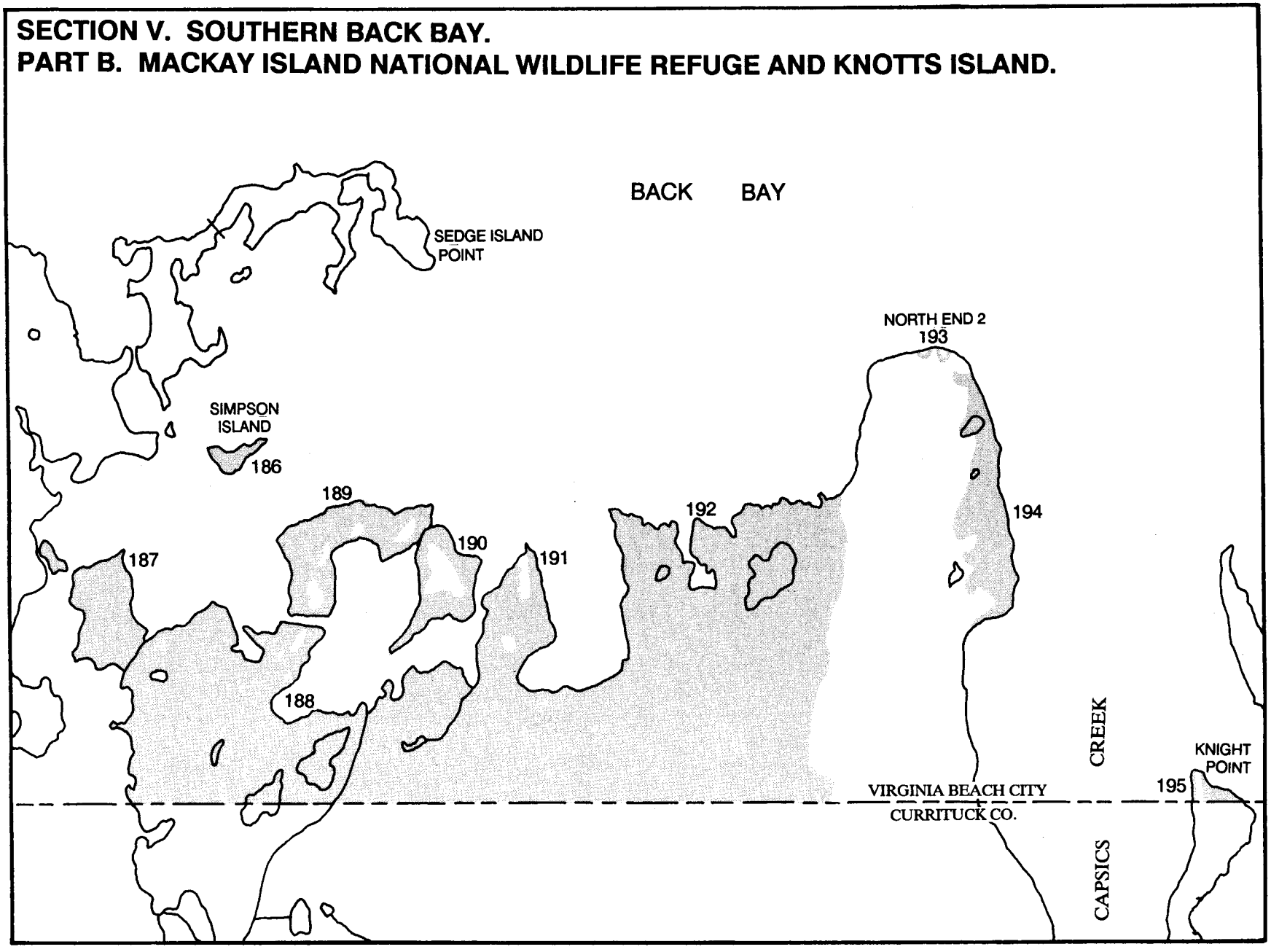
#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
176	Morse Neck	4.83	%		2	45	15		2		1	--	--	--	--	--	--	--				
			acres		.10	2.17	.72		.10		.05											
177	Morse Neck	13.19	%	20	1	40	15	--	--	--	--		--	1	--	--	--		--			
			acres	2.64	.13	5.28	1.98							.13								
178	Morse Neck	.29	%	1	66	1		--	--			--	--									
			acres	--	.19	--																
179	Morse Neck	34.90	%	40	2	15	40	--	--	--	2	--	--	--	--	--	--		--			
			acres	13.96	.70	5.24	13.96				.70											
180	Morse Neck	112.69	%	3	5	23	54	--	--	2	3	--	3	--	1	--	--		--			
			acres	3.38	5.63	25.92	60.85			2.25	3.38		3.38		1.13							
181	Pocahontas Waterfowl Area	1.14	%	--	--	10	--	12		--	--	--	--		13	2	--	--	--			
			acres			.11		.14							.15	.02						
182	Pocahontas Waterfowl Area	16.70	%	--	--	--	34	--		--	--	--		--	1	--	--	--				
			acres				5.68								.17							
183	Pocahontas Waterfowl Area	411.21	%	--	--	--	50	1		--	1	1	--	--	1		--	--	--			
			acres				205.61	4.11			4.11	4.11			4.11							

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
176		--	33	--	--	--		2	--				--			--			f-, ff-, ss-, cc-, am-	Dredged channels in marsh	XI
			1.59					.10													
177		--	23	--	--			--	--				--			--	--			Dredged channels in marsh	XI
			3.03																		
178		1	30	--		--		--								--	1		o-, ff-, ss-, am-	Dredged channels and spoil. Fringe marsh along channel edge	II
		--	.09														--				
179		--	1	--		--		--			--		--			--	--		o-, ff-, ss-, vv-, am-	Marsh dominated by big cordgrass and cattail	XI
			.35																		
180		1	1	--	--	--		--	--	--		--	--			3	--		d-, o-, ff1, oo-	Marsh dominated by cattail	VI
		1.13	1.13													3.38			ff1.13		
181		63		--				--	--	--		--	--	--			--		o-, ah-, vv-, ss-	Small marsh island	XI
		.71																			
182		65						--	--	--		--		--		--	--		ff-, oo-, vv-	Marsh island dominated by switchgrass	XI
		10.86																			
183		46		--				--	--	--		--	--	--		--	--		o-, ff-, oo-, vv-, ss-	Large marsh island dominated by cattail and switchgrass	VI
		189.16																			

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
184	Pocahontas Waterfowl Area	38.76	%	--	2	2	38	1		--	2	1	--	--	2	--	--	2	1			1
			acres		.78	.78	14.73	.39			.78	.39			.78			.78	.39			.39
185	Pocahontas Waterfowl Area	45.66	%	1	1	1	40	1		--	--	--	--	--	2	--	--	--	--			--
			acres	.46	.46	.46	18.26	.46							.91							
	Total Section V. Part A.	679.37	%																			
			acres	20.44	7.99	39.96	321.79	5.10	.10	2.25	9.02	4.50	3.38	.13	7.25	.02		.78	.39			.39
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pannywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
184		48						--		--						--			oo-	Marsh island dominated by switchgrass and cattail	XI
		18.60																			
185		53						--	--	1									d-, o-, oo-, vv-	Marsh island dominated by switchgrass and cattail	XI
		24.20								.46											
T																					
		244.66	6.19					.10		.46						3.38			1.13		

SECTION V. SOUTHERN BACK BAY.
PART B. MACKAY ISLAND NATIONAL WILDLIFE REFUGE AND KNOTTS ISLAND.



Section V. Southern Back Bay. Part B. Mackay Island National Wildlife Refuge and Knotts Island.

*	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
186	Simpson Island	4.27	%	30	--		20	4		--	5	4	2	--	2	2	25	2	2			
			acres	1.28			.85	.17			.21	.17	.09		.09	.09	1.07	.09	.09			
187	Mackay Island Refuge	29.10	%	--	--		50	--		--		--	1		1		--	--				
			acres				14.55						.29		.29							
188	Mackay Island Refuge	163.41	%	2	2	4	48	1	--	--	1	--	1	--	1	--	--	--	1			
			acres	3.27	3.27	6.54	78.44	1.63			1.63		1.63		1.63				1.63			
189	Mackay Island Refuge	35.68	%	55	5	3	2	--		--	--	--	--	--	--	--	--		2	--		
			acres	19.62	1.78	1.07	.71												.71			
190	Mackay Island Refuge	18.18	%	20	30	10	5	--	--	--	--	--	--	--	--	--	--			--		
			acres	3.64	5.45	1.82	.91															
191	Mackay Island Refuge	27.81	%	1	40	35	--	2	--	--	--	--	--	--	--	--	--	--	--	--		
			acres	.28	11.12	9.73		.56														
192	Mackay Island Refuge	445.25	%	6	2	15	67	1	--	--	--	--	4	--	2	--	--		1	--		
			acres	26.72	8.91	66.79	298.32	4.45					17.81		8.91				4.45			
193	Mackay Island Refuge	.25	%		5		25	46	20	1	2		--		1	--	--		--			
			acres		.01		.06	.12	.05	--	.01				--							

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
186				1				1		--		--				--			ff-, am-	Marsh island with diverse vegetation	XI
				.04				.04													
187		47		--				--	--				--			1			d-, o-, ss-, tt-	Marsh islands dominated by cattail and switchgrass	VI
		13.68														.29					
188		39	--	--	--	--		--	--	--	--	--	--	--		--	--		d-, f-, o-, ff-, oo-, ah-, ss-,	vv-, cc-, ak-, am- Marsh dominated by cattail and switchgrass	XI
		63.73																			
189		30		--	1	--		--	--				1	--		--	1		ss-, ff-, oo-, am-	Marsh island dominated by big cordgrass	V
		10.70			.36								.36				.36				
190		25		--	--	--							7			--	1		ff-, oo-, am2	Diverse vegetation, high marsh	XI
		4.55											1.27				.18		am.36		
191	--	11		--	--	--		1	--	--			5			--	--		ff-, oo-, tt-, b-, ww-, am5	High marsh vegetation	XI
		3.06						.28					1.39						am1.39		
192	--	1	1	--	--	--		--	--	--			--	--		--	--	--	d-, f-, o-, ff-, oo-, ss-, uu-,	vv-, ww-, am- Low marsh dominated by cattail	VI
		4.45	4.45																		
193		--						--		--						--			cc-, am-	Low marsh dominated by smartweeds and cattail	XI

#	Marsh Location	Total Acres		Big Cordgrass	Salt Meadow Hay	Needle Rush	Cattail	Smartweeds	Tearthumb	Marsh Hibiscus	Marsh Mallow	Marsh Fleabane	Wild Millet	Water Hemp	Spikerush	Aster	Nut Sedge	Saltmarsh Cordgrass	Olney Threesquare	Common Threesquare	Saltmarsh Bulrush	Soft Stem Bulrush
194	Mackay Island Refuge	36.32	%	28	1	29	30	1	--	2	6	--	--	--	--	--	--		2		--	
			acres	10.17	.36	10.53	10.90	.36		.73	2.18								.73			
195	Knight Point	2.80	%		30	18	10	1			--	10	10	--	1	--	--	1	4	--		
			acres		.84	.50	.28	.03				.28	.28		.03			.03	.11			
	Total Section V. Part B.	763.07	%																			
			acres	64.98	31.74	96.98	405.02	7.32	.05	.73	4.03	.45	20.10		10.95	.09	1.07	.12	7.72			
	Total Section V.	1442.44	%																			
			acres	85.42	39.73	136.94	726.81	12.42	.15	2.98	13.05	4.95	23.48	.13	18.20	.11	1.07	.90	8.11			.39
	GRAND TOTAL	9924.91	%																			
			acres	605.41	449.43	2370.55	4004.03	180.54	70.65	139.38	102.00	42.80	187.78	78.93	228.77	26.80	22.84	132.76	260.75	100.36	132.75	18.72
			%																			
			acres																			
			%																			
			acres																			
			%																			
			acres																			

#	Woolgrass	Switch Grass	Common Reed	Foxtail Grass	Wax Myrtle	Marsh Ferns	Saltmarsh Loosestrife	Climbing Hempweed	Pennywort	Arrowhead	Pickerelweed	Swamp Milkweed	Groundsel Tree	Water Parsnip	Frogfruit	Plumegrass	Sacciolepis	Rice Cutgrass	Others	Observations	Marsh Type
194		--		--	--	--		--	--	--						1			d-, f-, ff-, oo-, bb-, cc-, am-	Diverse vegetation	XI
																.36					
195		--		--			--	--	--	--	--		--		--		--		ff-, ww15, oo-, xx-, yy-	Small cove marsh	XI
																			ww.42		
T																					
		100.17	4.45	.04	.36			.32					3.02			.65	.54		2.17		
T																					
		344.83	10.64	.04	.36			.42		.46			3.02			4.03	.54		3.30		
GT																					
	15.96	426.60	84.69	.54	50.74	4.52	4.57	4.52	1.19	3.86	1.09		12.40	2.38	.12	16.02	13.90	28.80	100.37		

Back Bay: Others List

A. Sweet Flag
B. False Nettle
C. Cardinal Flower
D. Water Hemlock
E. Button Bush
F. Swamp Rose
G. Swamp Loosestrife
H. Arrow Arum
I. Water Lily
J. False Loosestrife
K. Jewelweed
L. Sedge
M. Lizard's-Tail
N. Mock Bishops-Weed
O. Beggar's Ticks
P. Water Horehound
Q. American Lotus
R. Bedstraw
S. Bald-Cypress
T. Mermaid-Weed
U. Wild Rye Grass
V. Partridge Pea
W. Wild Rice
X. Dayflower
Y. Bur-Head
Z. Mud Plantain
AA. Royal Fern
BB. Water Dock
CC. Black Willow
DD. Dodder
EE. Duckweed
FF. Seaside Goldenrod
GG. Ammannia
HH. Arrow Grass
II. Lilaeopsis
JJ. Eclipta
KK. Live Oak
OO. Boneset
QQ. Red Maple
RR. Sweet Gum
SS. Lobelia
TT. Germander
UU. Dune Bean
VV. Blue Flag
WW. Marsh Elder
XX. Water-Hyssop
YY. Marsh Fimbristylis
ZZ. Saltwort
AB. Beak-Rush
AE. Meadow-Beauty
AF. Nodding Ladies' Tresses
AG. Buttercup
AH. Eryngo
AI. Water Fern
AJ. Marsh Pink
AK. Sprangletop
AL. Cane
AM. Fireweed

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