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## City of Chesapeake Tidal Marsh Inventory

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# **CITY OF CHESAPEAKE TIDAL MARSH INVENTORY**

**Special Report No. 312 in Applied Marine Science and Ocean Engineering**

**Gene M. Silberhorn and Sharon Dewing**



**WETLANDS PROGRAM**

**VIRGINIA INSTITUTE OF MARINE SCIENCE  
SCHOOL OF MARINE SCIENCE  
THE COLLEGE OF WILLIAM AND MARY  
Gloucester Point, Virginia 23062**

**JULY 1991**

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**School of Marine Science  
The College of William and Mary  
Gloucester Point, Virginia 23062**

**Dr. Carl Hershner, Program Director  
Dr. Robert J. Byrne, Acting Dean/Director**

**JULY 1991**



## 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	Accomack County	King and Queen County
Northumberland County	Northampton County	Prince George County
Mathews County	Westmoreland County	and City of Hopewell
York County and the Town of Poquoson	James City County and the City of Williamsburg	City of Portsmouth
Stafford County	Surry County	City of Virginia Beach Vol. 3
Prince William County	Spotsylvania and Caroline Counties and the City of Fredericksburg	Richmond County
King George County	New Kent County	Charles City County
City of Hampton	Essex County	Henrico County, Chesterfield County, Colonial Heights, Petersburg and the City of Richmond
Fairfax County	Isle of Wight County	City of Suffolk
Gloucester County	Middlesex County	
City of Virginia Beach Vol. 1 and 2	City of Norfolk	
City of Newport News and Fort Eustis	King William County and Town of West Point	

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, Cities of Chesapeake, Norfolk and Portsmouth, SRAMSOE No. 136, 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**

We would like to thank Mr. Arthur Harris for his field assistance in gathering the data for this report.

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## **Introduction**

The tidal wetlands within the City of Chesapeake have been subjected to developmental impact, especially along the Southern Branch of the Elizabeth River. Many of the wetlands in this watershed have been compromised, historically, in a number of ways by military bases, industrial complexes and the construction of the Intracoastal Waterway. It is unfortunate that this estuarine system is one of the most polluted in the Chesapeake Bay Watershed. Wetlands in the Western and Eastern Branches of the Elizabeth River have been impacted mainly by urban residential development.

Similar wetland losses can be noted in other Hampton Roads cities (Norfolk, Portsmouth and Virginia Beach).

Against this background, the remaining 1,738 acres of tidal marshes in the City of Chesapeake represent a valuable resource well worth protecting.

This report is divided into three sections, reflecting the main watersheds of the Elizabeth River within the City of Chesapeake: Section I: Western Branch of the Elizabeth River, totalling 421 acres of tidal marshes; Section II: Southern Branch of the Elizabeth River, with 1,234 acres, and the Eastern Branch of the Elizabeth River (mainly Indian River), Section III, with a total of 91 acres.

The value of these urban wetlands to wildlife, fishes, water quality and as a buffer to erosion is seldom overemphasized. They make a substantial contribution to the estuarine food web by virtue of organic matter (detritus) produced and flushed into the receiving waters. Tidal wetlands are often nursery areas for the juveniles of many commercially important finfish and shellfish as well as feeding areas for numerous forage fish. The habitat that they provide for waterfowl, wading birds, song birds and small mammals is vitally important, particularly in an urban/industrial setting. Their role as a filter for upland runoff and as a focal point for nutrient cycling is again especially important in intensely developed areas where point and nonpoint inputs of nutrients and various pollutants have a significant impact on adjacent water quality. Tidal marshes also provide an effective buffer against shoreline erosion by binding sediments and dissipating wave energy.



## **Methods**

Aerial photographs and topographic maps (U.S.G.S.) were utilized to determine wetland locations, wetland boundaries and patterns of marsh vegetation. Acreages and wetland boundaries were substantiated by observations on foot, by boat and by low level overflights. Individual plant species percentages are quantitative estimates of coverage based on visual field inspections of every marsh. In some instances, especially in tidal freshwater areas, those percentages are subject to seasonal bias.

Most of the field work was done in the summer of 1978. Subsequent field work was done in 1988-89. Aerial photography (1989) of the lower part of the Southern Branch of the Elizabeth River was utilized to facilitate marsh identification and delineation. National Wetland Inventory Maps (U.S.F.W.S.) were also utilized in the preparation of this report.

Marshes one quarter of an acre or larger are designated by number. Many marshes smaller than one quarter acre (usually narrow fringing marshes) are designated by the same symbol (color) as the larger marshes on the section maps but assigned no number. Small marshes (less than one acre) are exaggerated and are not indicated to scale. Information such as individual marsh acreage, plant species percentage and acreage, marsh type, and other observations are recorded in tabular form. Plant species percentages are recorded to the nearest percent, and acreages to the nearest tenth of an acre. In marshes of less than one acre, the areas are recorded to the nearest hundredth of an acre. In those instances where an individual plant species is estimated to amount to less than 0.5 percent, the symbol (-) is used to indicate a trace amount. In unusual situations where an individual marsh is estimated to contain 50 percent or more of a species that is not listed as a marsh type, the closest applicable marsh type is used.



## 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.

Big Cordgrass*	<i>Spartina cynosuroides</i> (L.) Roth
Black Needlerush*	<i>Juncus roemerianus</i> Scheele
Cattails*	<i>Typha angustifolia</i> L. <i>Typha latifolia</i> L.
Marsh Fleabane*	<i>Pluchea purpurascens</i> (Swartz) DC
Marsh Mallow	<i>Kosteletskya virginica</i> Presl.
Orach	<i>Atriplex patula</i> L.
Reedgrass*	<i>Calamagrostis cinnoides</i> (Muhl.) Burton
Saltbush*	<i>Baccharis halimifolia</i> L. <i>Iva frutescens</i> L.
Saltmarsh Aster	<i>Aster subulatus</i> Michx. <i>Aster tenuifolius</i> L.
Saltmarsh Bulrush	<i>Scirpus robustus</i> Pursh
Saltmarsh Cordgrass*	<i>Spartina alterniflora</i> Loisel
Saltmeadow Grass*	<i>Distichlis spicata</i> (L.) Greene <i>Spartina patens</i> (Aiton) Muhl.
Smartweed*	<i>Polygonum</i> sp.
Spikerush*	<i>Eleocharis parvula</i> (R.+S.) Link
Switch Grass*	<i>Panicum virgatum</i> L.
Water Hemp*	<i>Amaranthus cannabinus</i> (L.) J.D. Sauer

\*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.



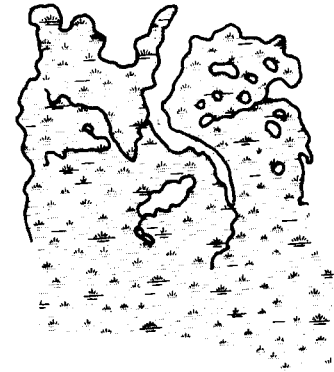
### Delta Marsh

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

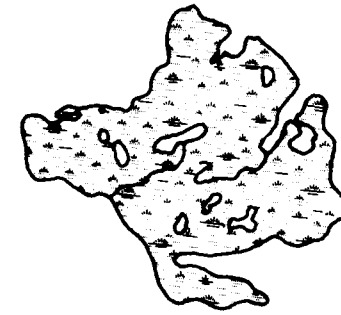
The marsh surface is at an elevation of mean high water or above; it is usually inundated less than twice daily by tidal action.

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.



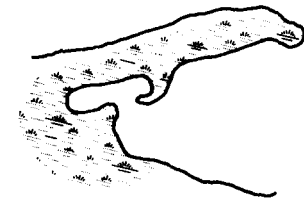
**Pocket Marsh**

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

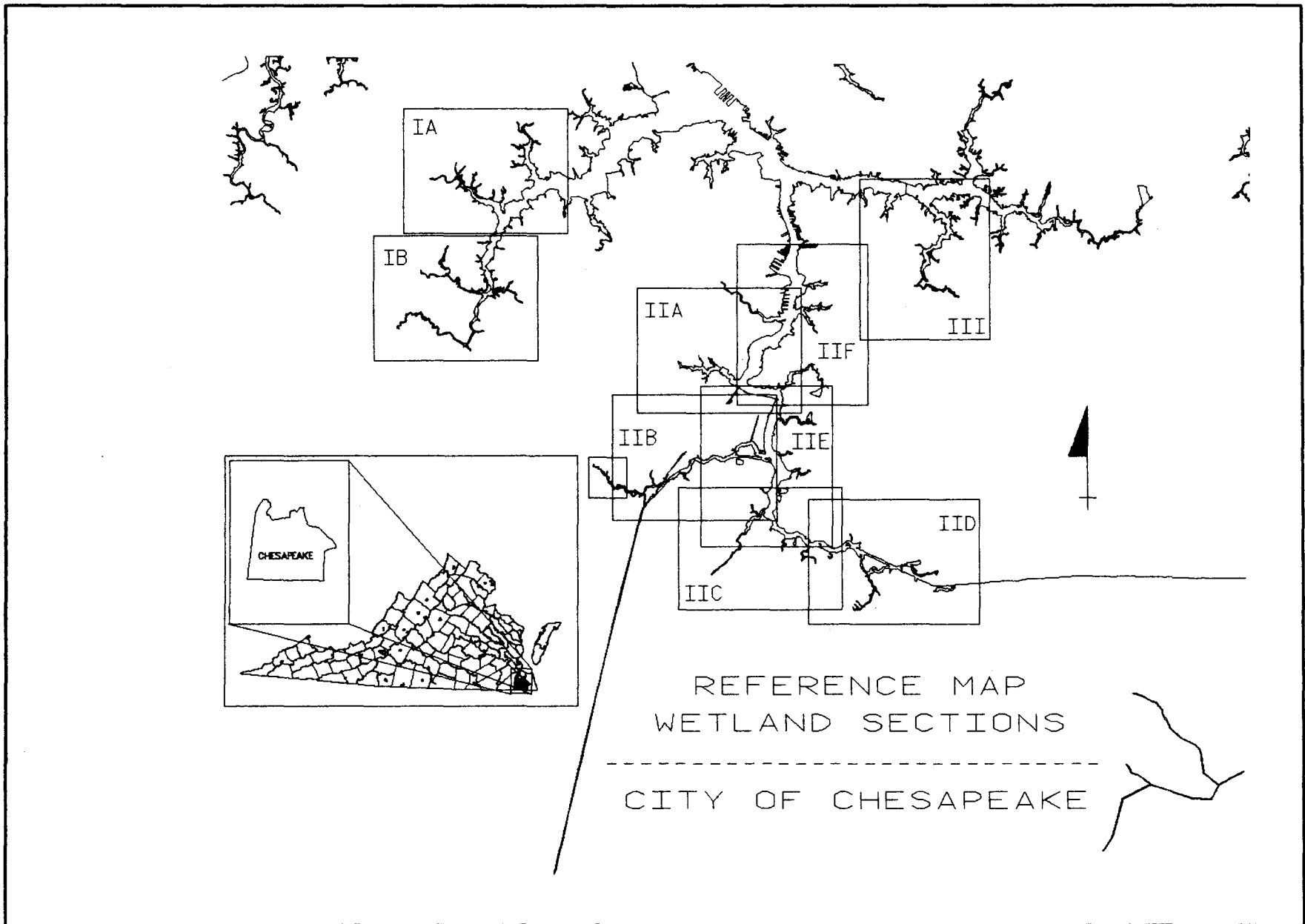


**Point or Spit Marsh**

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.





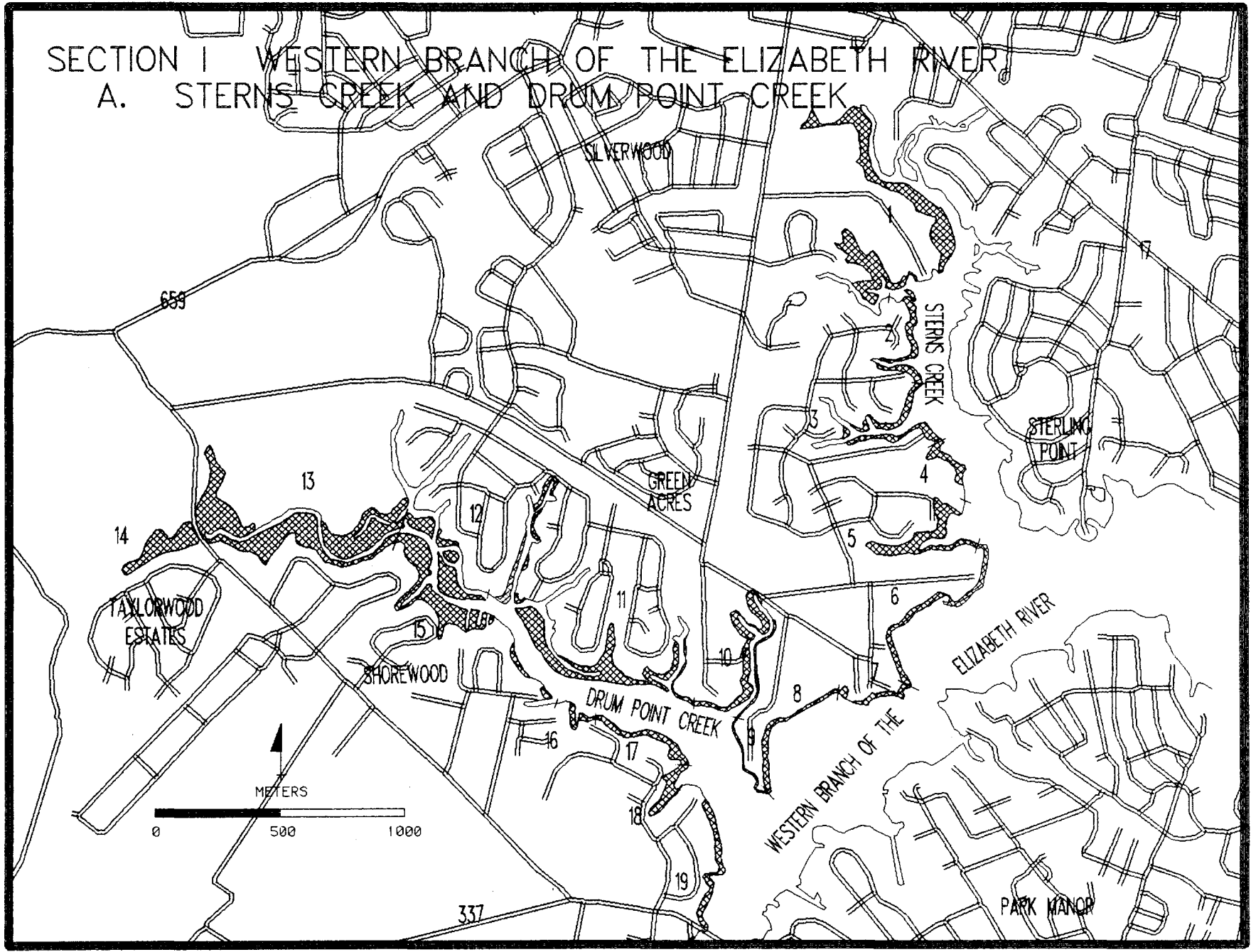




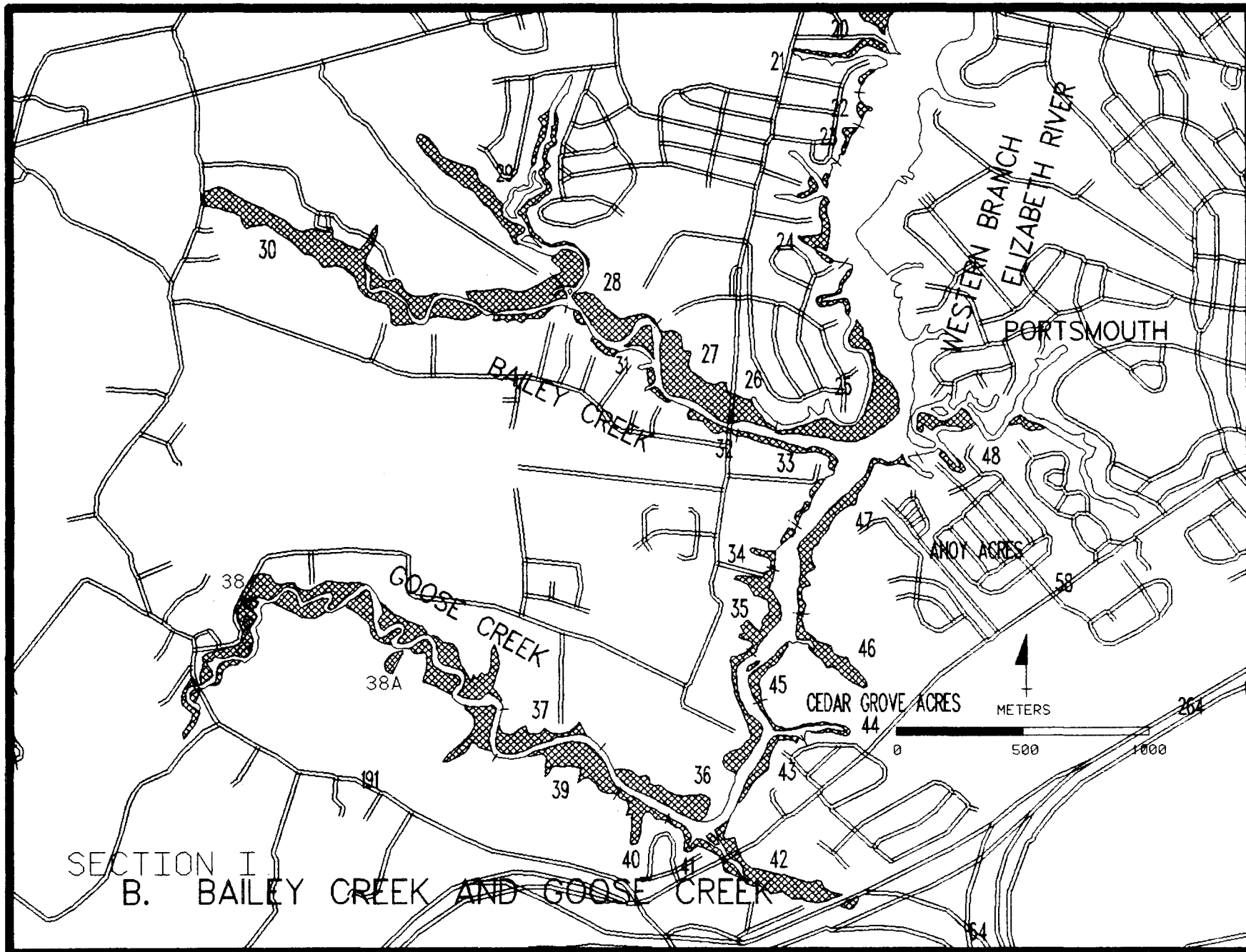
**Section I**

**Western Branch of the Elizabeth River**

SECTION I WESTERN BRANCH OF THE ELIZABETH RIVER  
A. STERNS CREEK AND DRUM POINT CREEK







# I. Western Branch of the Elizabeth River.

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needle-rush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
1	Sterns Creek	15.00	%	85			10	3	2									--	--	Creek marsh dominated by SA, upper end filled	I
			A	12.75			1.50	.45	.30												
2	Sterns Creek	.91	%	60			10	30												Fringe marsh 20-30' wide, dredged channel	I
			A	.55			.10	.27													
3	Sterns Creek	2.20	%	80		2	10	6	2											Intermittent fringe marsh, dredged cove	I
			A	1.76		.04	.22	.13	.04												
4	Sterns Creek	.50	%	60	2	30	4				4									Point marsh with pocket area	I
			A	.30	.01	.15	.02			.02											
5	Sterns Creek	7.00	%	90	2		4			2									2	Creek marsh with embayed areas	I
			A	6.30	.14		.28			.14											
6	Western Branch Elizabeth River	2.41	%	80	5	5	10												--	Fringe marsh dominated by SA	I
			A	1.93	.12	.12	.24														
7	Western Branch Elizabeth River	.50	%	60			10	20		10										Fringe and cove marsh dominated by SA; rip rap	I
			A	.30			.05	.10		.05											
8	Western Branch Elizabeth River	.65	%	80		10	5	5												Fringe marsh area 10-20' wide	I
			A	.52		.07	.03	.03													

#	Marsh Location	Total Acres																		Observations	Marsh Type
			Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bujrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp			
9	Drum Point Creek	.60	%	80		10	5	5												Fringe marsh 10-30' wide	I
			A	.48		.06	.03	.03													
10	Drum Point Creek	3.00	%	84	2	1	7	3	1									--	2	Long narrow fringe marsh, dredged channel	I
			A	2.52	.06	.03	.21	.09	.03												
11	Drum Point Creek	18.48	%	60	--		20	10	10											Fringe marsh with spit and embayed channelization	I
			A	11.09			3.70	1.85	1.85												
12	Drum Point Creek	19.00	%	70	2		20	2	5									--	1	Extensive marsh islands due to channelization	I
			A	13.30	.38		3.80	.38	.95												
13	Drum Point Creek	36.00	%	13		5	60	20											2	Creek marsh with fringe and embayed areas	I
			A	4.68		1.80	21.60	7.20													
14	Drum Point Creek	15.00	%				100													Upper limit of creek, dominated by saltbush	I
			A				15.00														
15	Drum Point Creek	4.00	%	20			20	50	10											Embayed marsh with fill and bulkhead	V
			A	.80			.80	2.00	.40												
16	Drum Point Creek	.50	%	95			1	1			3									Pocket marsh	I
			A	.48			.01	.01			.02										

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type	
17	Drum Point Creek	1.65	%	60			5	5	30												Broad fringe marsh	I
			A	.99			.08	.08	.50													
18	Drum Point Creek	5.00	%	75			3	2	20												Pocket marsh	I
			A	3.75			.15	.10	1.00													
19	Drum Point Creek	2.27	%	75	2	--	10	7	6										--		Long fringe marsh	I
			A	1.70	.05		.23	.16	.14													
20	Western Branch Elizabeth River	5.00	%	85	5		2	2	5										1		pocket marsh with small pond behind; filled for ramp	I
			A	4.25	.25		.10	.10	.25											.05		
21	Western Branch Elizabeth River	1.50	%	85			10	5										--	--		Fringe marsh with embayed area, channelization	I
			A	1.28			.15	.08														
22	Western Branch Elizabeth River	.25	%	65	5		20	10													Embayed marsh	I
			A	.16	.01		.05	.03														
23	Western Branch Elizabeth River	.25	%	70	5			25													Small fringe marsh	I
			A	.18	.01			.06														
24	Western Branch Elizabeth River	1.00	%	90	5		--	5													Embayed marsh	I
			A	.90	.05			.05														

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type	
25	Mouth of Bailey Creek	17.75	%	40	10	30	17	3			--	--								Marsh island and fringe on channel	XII	
			A	7.10	1.78	5.33	3.02	.53														
26	Bailey Creek	4.00	%	40	--	20	30	5	5											Embayed marsh	XII	
			A	1.60		.80	1.20	.20	.20													
27	Bailey Creek	13.00	%	5	--	10	80	5												Extensive embayed marsh	IV	
			A	.65		1.30	10.40	.65														
28	Bailey Creek	14.00	%	65	10	5	10	10										--	--	Extensive marsh	I	
			A	9.10	1.40	.70	1.40	1.40														
29	Bailey Creek	25.00	%	40	--	5	40	12	--										2	1	Large creek marsh which has been channelized	XII
			A	10.00		1.25	10.00	3.00										.50	.25			
30	Bailey Creek	50.00	%	10			35	50	--		--		--						--	5	Large creek marsh, upper end channelized	V
			A	5.00			17.50	25.00												2.50		
31	Bailey Creek	3.00	%	40	10	--	40	10											--	--	Point marsh, channelized area	XII
			A	1.20	.30		1.20	.30														
32	Bailey Creek	1.00	%	50		--	30	20	--	--											Somewhat embayed fringe marsh, fill on edge	I
			A	.50			.30	.20														

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type	
33	Bailey Creek	1.14	%	70	5	--	10	10	--	5											Fringe marsh	I
			A	.80	.06		.11	.11		.06												
34	Western Branch Elizabeth River	.25	%	60			10		30												Pocket marsh	I
			A	.15			.03		.08													
35	Western Branch Elizabeth River	5.00	%	84	4		6	4		2											Fringe and pocket marsh with embayed areas; fill + bulkhead	
			A	4.20	.20		.30	.20		.10												
36	Goose Creek	20.00	%	20	3	22	50	5													Embayed marsh	IV
			A	4.00	.60	4.40	10.00	1.00														
37	Goose Creek	7.00	%	30	10	15	25	20	--									--	--		Embayed marsh	XII
			A	2.10	.70	1.05	1.75	1.40														
38	Goose Creek	46.00	%	2	2	5	25	60			1	1						1	3		Creek marsh	V
			A	.92	.92	2.30	11.50	27.60				.46	.46						.46	1.38		
38A	Goose Creek	8.30	%	54		3		15		2	10		8	3		5					Man-made marsh, former sand pit	I
			A	4.48		.25		1.25		.17	.83		.66	.25		.42						
39	Goose Creek	10.00	%	7	10	30	30	20											3		Embayed marsh	XII
			A	.70	1.00	3.00	3.00	2.00												.30		

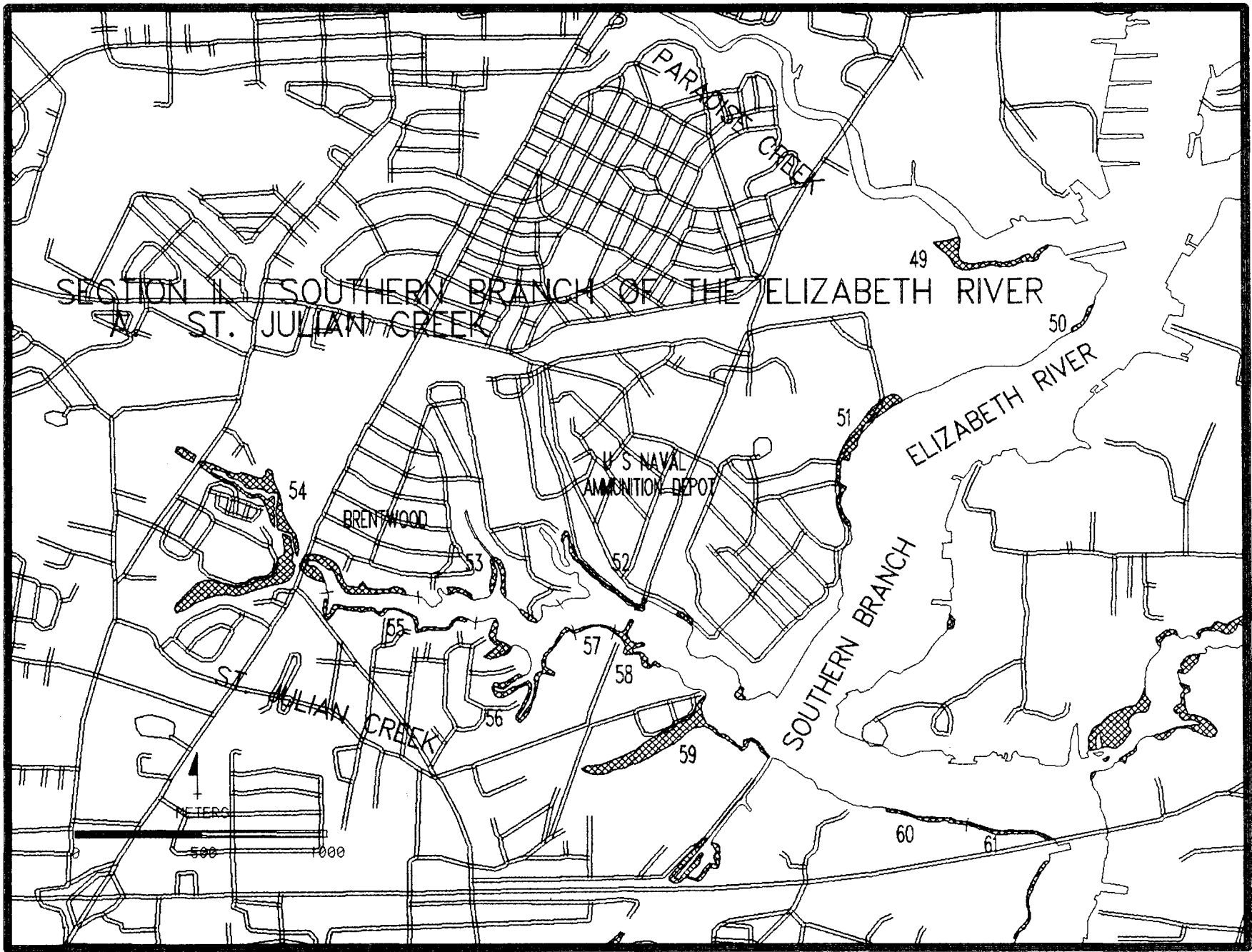
#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Buirush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
40	Goose Creek	5.00	%	50	10		10	30	--											Pocket marsh with small fringe	I
			A	2.50	.50		.50	1.50													
41	Goose Creek	1.29	%	10	10		60	20	--											Small creek marsh with embayed area	IV
			A	.13	.13		.77	.24													
42	Goose Creek	10.00	%	5		5	20	70												Creek marsh	V
			A	.50		.50	2.00	7.00													
43	Western Branch Elizabeth River	1.29	%	30	10		25	30	5											Long fringe marsh	XII
			A	.39	.13		.32	.39	.06												
44	Western Branch Elizabeth River	.92	%	50			20	30	--											Fringe marsh in small creek	I
			A	.46			.18	.28													
45	Western Branch Elizabeth River	4.00	%	90		--	10	--	--											Marsh with areas of fill	I
			A	3.60			.40														
46	Western Branch Elizabeth River	7.00	%	70	5		10	2	3									10		Creek marsh	I
			A	4.90	.35		.70	.14	.21									.70			
47	Western Branch Elizabeth River	12.00	%	60	2	20	12	5		1										Extensive fringe marsh somewhat embayed	I
			A	7.20	.24	2.40	1.44	.60		.12											

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type	
48	Western Branch Elizabeth River	11.68	%	55	3	20	15	5	-										2	Small creek marsh, channelized	I	
			A	6.42	.35	2.34	1.75	.58														.23
T	Total Section I	421.29	%																			
			A	149.57	9.74	27.89	128.12	88.77	6.01	.66	1.31	.46	.66	.25			.42		2.38	5.10		
			%																			
			A																			
			%																			
			A																			
			%																			
			A																			
			%																			
			A																			

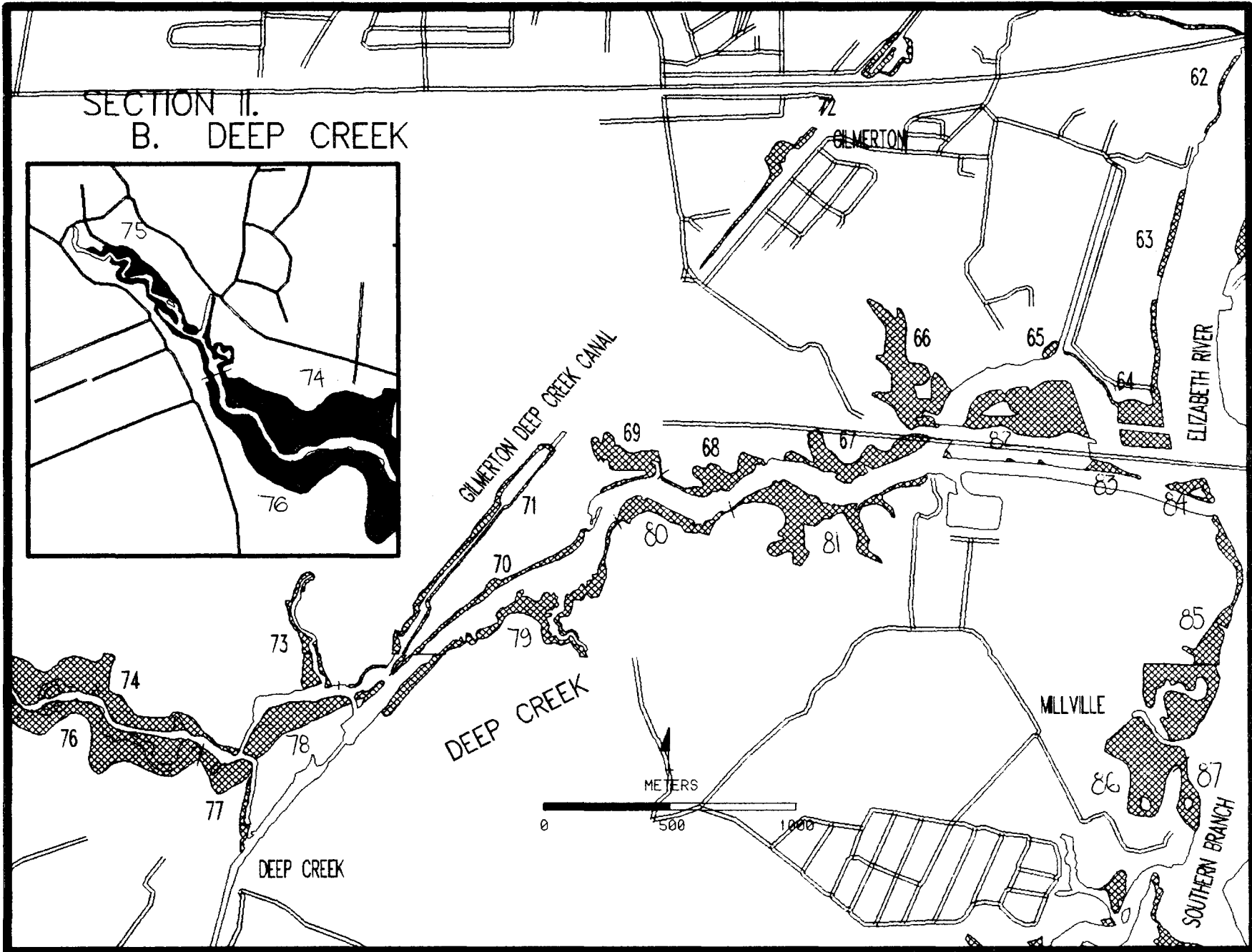
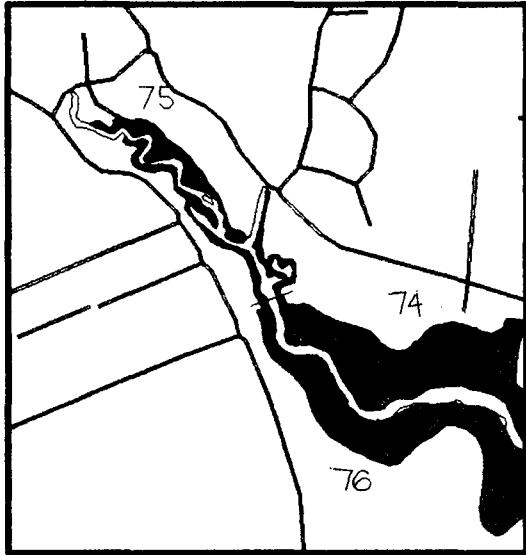


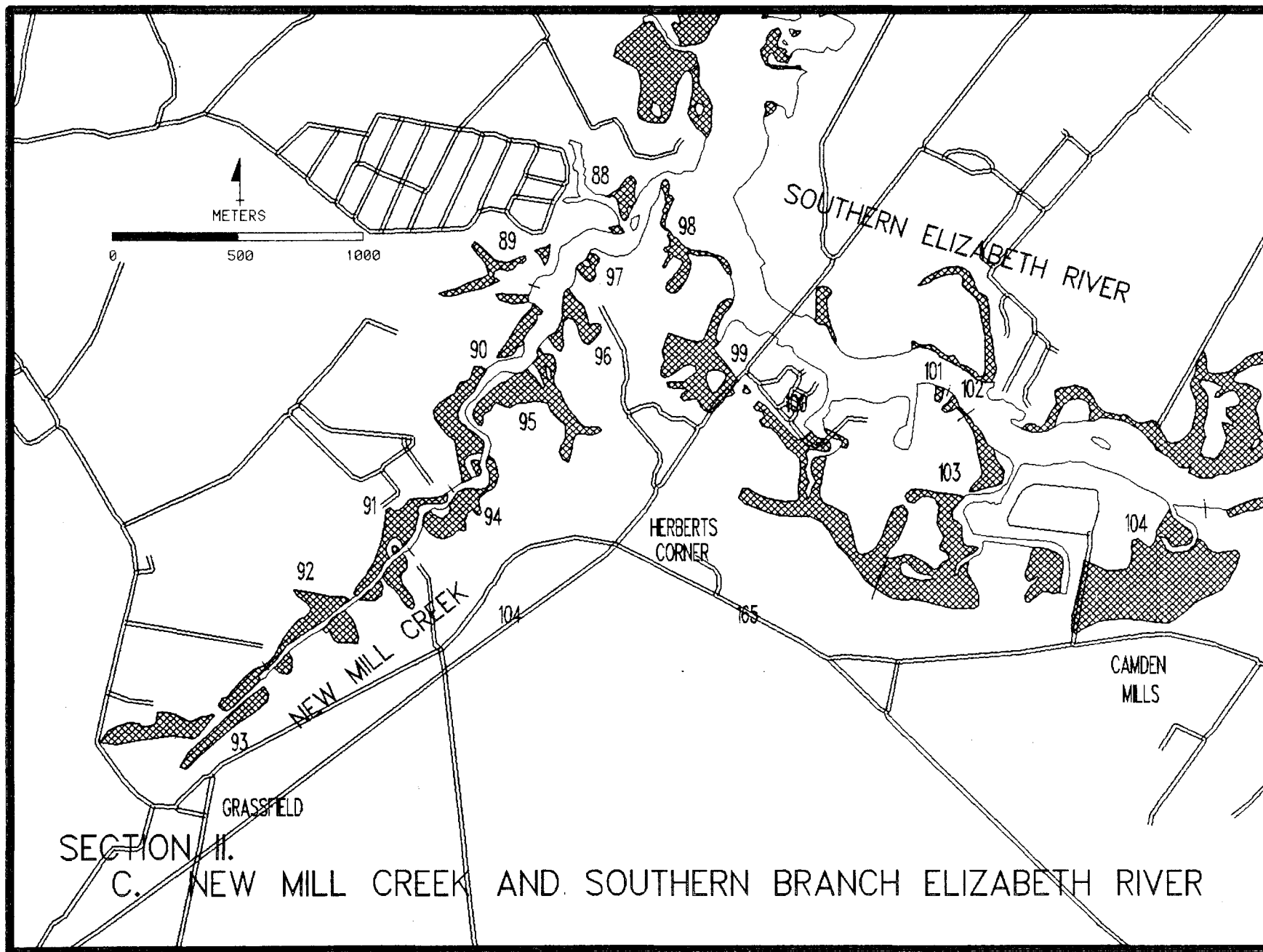
**Section II**

**Southern Branch of the Elizabeth River**

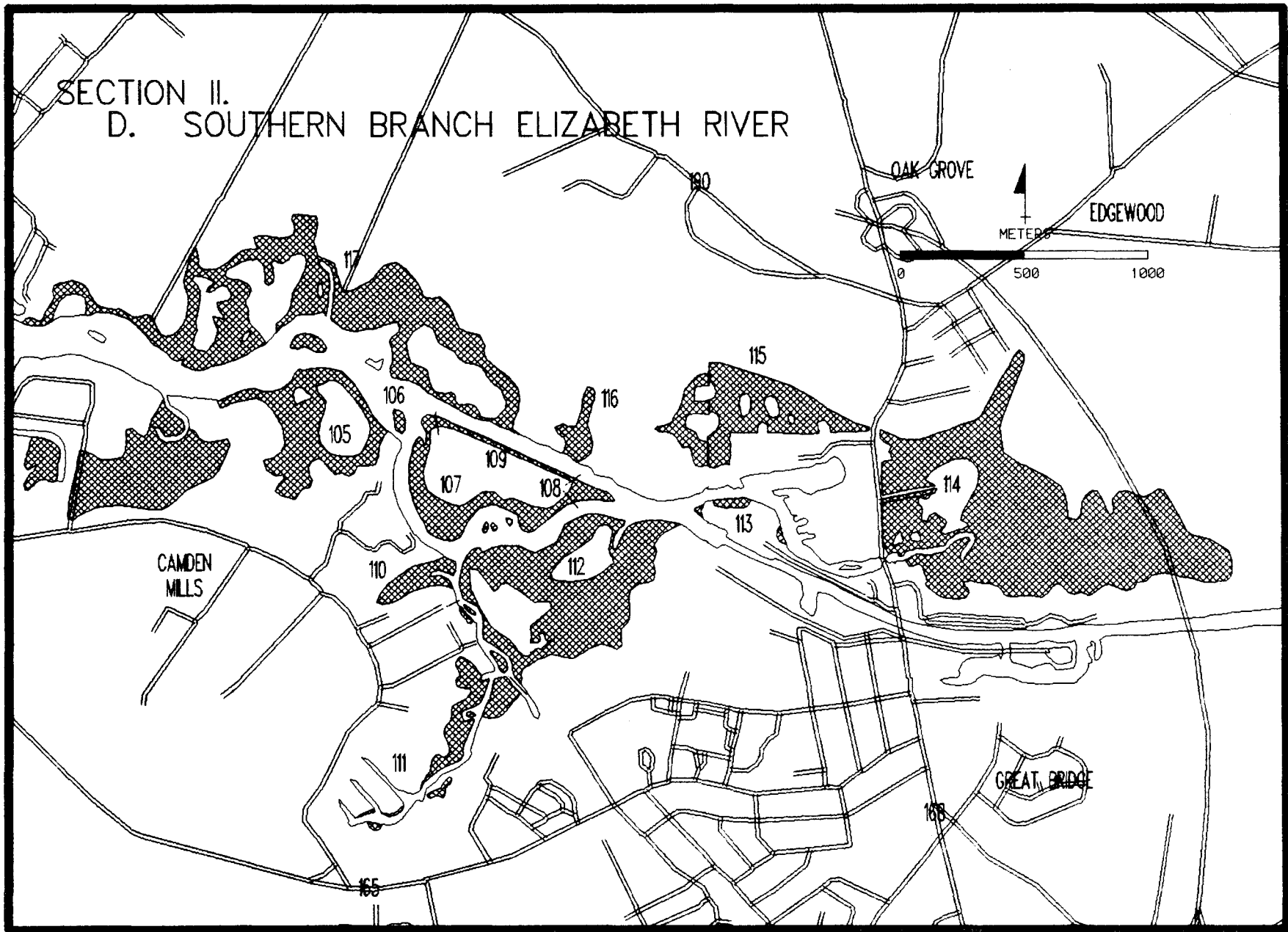


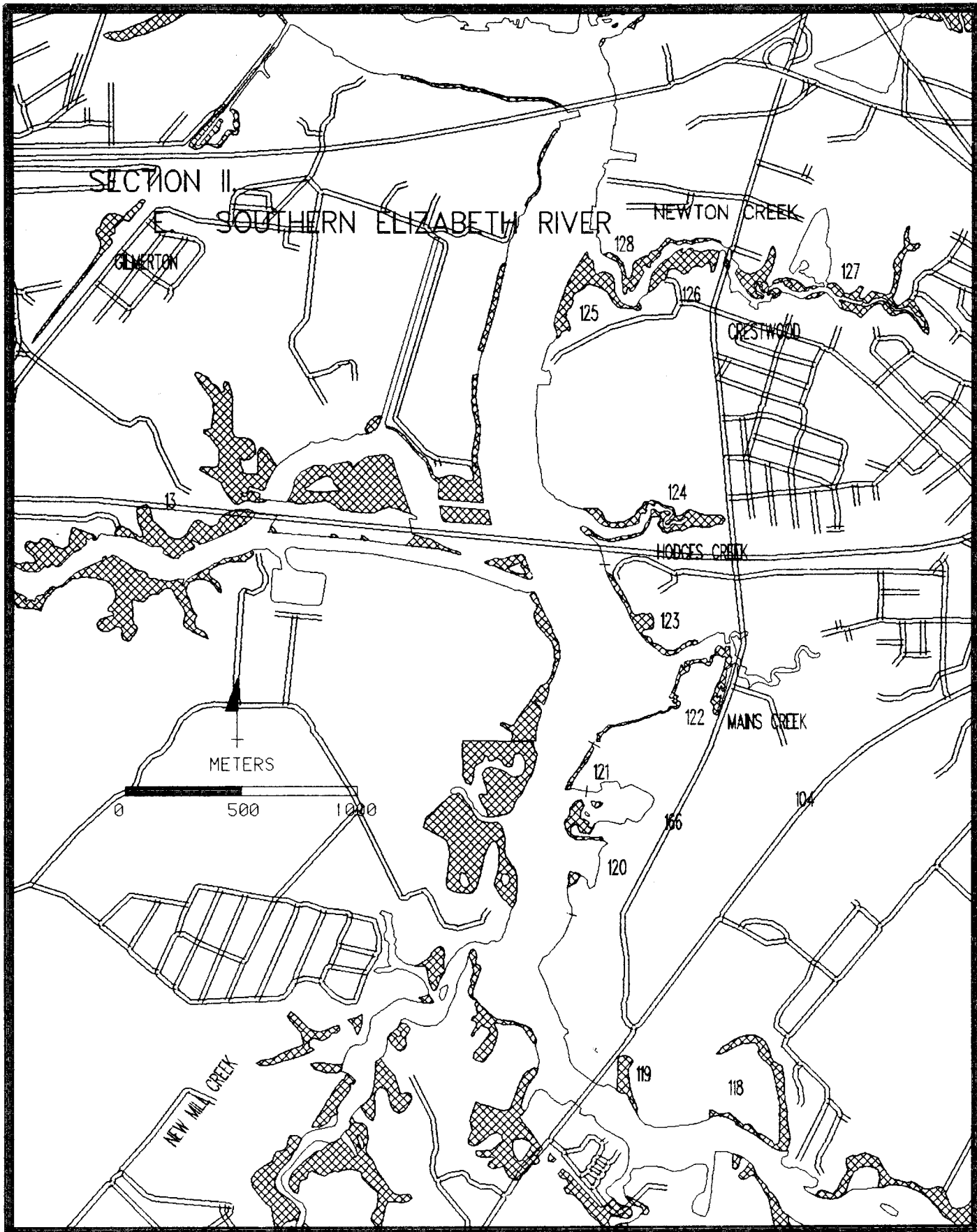
SECTION II.  
B. DEEP CREEK





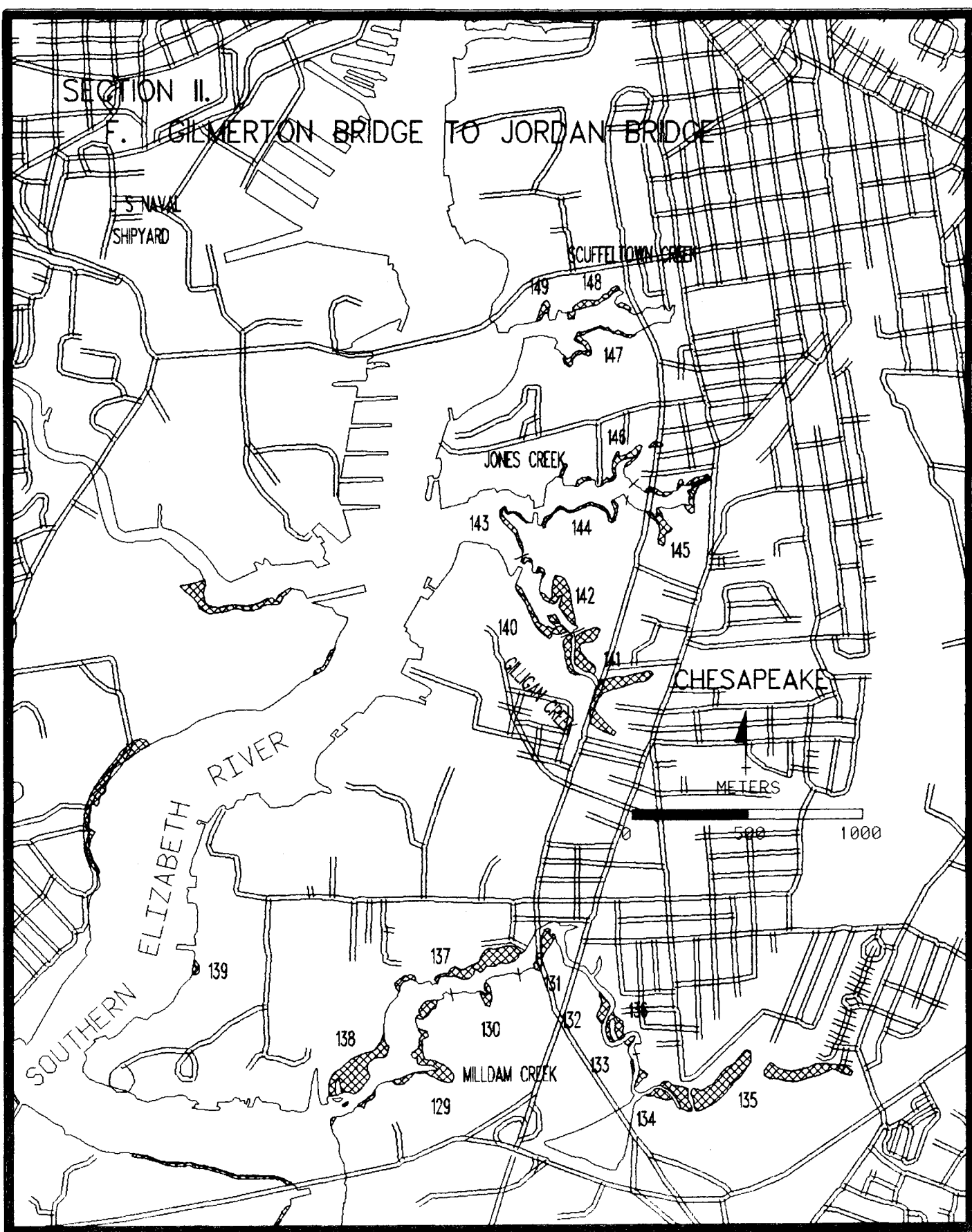
SECTION II.  
D. SOUTHERN BRANCH ELIZABETH RIVER





SECTION II.

F. GILMERTON BRIDGE TO JORDAN BRIDGE



S. NAVAL SHIPYARD

SCUFFLETOWN CREEK

JONES CREEK

OLIGAN CREEK

CHESAPEAKE

ELIZABETH RIVER

SOUTHERN RIVER

MILLDAM CREEK

METERS

## II. Southern Branch of the Elizabeth River.

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
49	Paradise Creek	4.68	%	50			5	25	20											Extensive embayed fringe marsh	I
			A	2.34			.23	1.17	.94												
50	Southern Branch Elizabeth River	.75	%	30			20	10	40											Small fringe marsh	XII
			A	.23			.15	.08	.30												
51	Southern Branch Elizabeth River	2.54	%	70			15		15											Fringe marsh	I
			A	1.78			.38		.38												
52	St. Julian Creek	.25	%	90	5		5													Intermittent fringe marsh	I
			A	.23	.01		.01														
53	St. Julian Creek	.25	%	70			15	--	15											Fringe marsh	I
			A	.18			.04		.04												
54	St. Julian Creek	35.00	%	100																Creek marsh, dominated by saltmarsh cordgrass	I
			A	35.00																	
55	St. Julian Creek	.30	%	90			10													Narrow fringe marsh	I
			A	.27			.03														
56	St. Julian Creek	3.00	%	85			10		5											Fringe marsh	I
			A	2.55			.30		.15												



#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Nodderush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
57	St. Julian Creek	.32	%	90	5		5													Narrow fringe marsh	I
			A	.29	.02		.02														
58	St. Julian Creek	1.50	%	90			10													Fringe and cove marsh	I
			A	1.35			.15														
59	St. Julian Creek	11.00	%	5			5	90												Small creek marsh	V
			A	.55			.55	9.90													
60	Southern Branch Elizabeth River	.25	%	90			5	5												Small fringe marsh	I
			A	.23			.01	.01													
61	Southern Branch Elizabeth River	.25	%	85			15													Small fringe marsh	I
			A	.21			.04														
62	Southern Branch Elizabeth River	.62	%	30			10	60												Narrow fringe marsh	V
			A	.19			.06	.37													
63	Southern Branch Elizabeth River	.62	%	90			5	5												Narrow fringe marsh	I
			A	.56			.03	.03													
64	Deep Creek	11.00	%	40	30	10	10	10												Channelized marsh	XII
			A	4.40	3.30	1.10	1.10	1.00													

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
65	Deep Creek	.62	%	90			5	5												Point marsh	I
			A	.56			.03	.03													
66	Deep Creek	17.00	%	90	8		2													Small creek marsh	I
			A	15.30	1.36		.34														
67	Deep Creek	18.00	%	40	30	--	10	15	5											Extensive fringe marsh somewhat embayed	XII
			A	7.20	5.40		1.80	2.70	.90												
68	Deep Creek	14.00	%	45	20		10	5	20											Extensive fringe marsh somewhat embayed	XII
			A	6.30	2.80		1.40	.70	2.80												
69	Deep Creek	16.00	%	70	5		10	10	5											Embayed creek marsh	XII
			A	11.20	.80		1.60	1.60	.80												
70	Deep Creek	6.00	%	85	5	3	5	2											--	Narrow fringe marsh	I
			A	5.10	.30	.18	.30	.12													
71	Gilmerton Deep Creek Canal	1.50	%	60			30		10											Narrow fringe marsh, bulkheading	I
			A	.90			.45		.15												
72	Gilmerton Deep Creek Canal	8.49	%	100																Pocket marsh on man-made canal	I
			A	8.49																	

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
73	Deep Creek	2.00	%	90			10													Fringe marsh	
			A	1.80			.20														
74	Deep Creek	29.00	%	85			5	10												Extensive embayed marsh with fill	I
			A	24.65			1.45	2.90													
75	Deep Creek	3.00	%	80	5	5	10													Creek marsh	I
			A	2.40	.15	.15	.30														
76	Deep Creek	30.00	%	80	2		10	6										2		Extensive embayed marsh, channelization	I
			A	24.00	.60		3.00	1.80										.60			
77	Deep Creek	2.00	%	80			5	15												Embayed marsh	I
			A	1.60			.10	.30													
78	Deep Creek	10.00	%	80	2		3	15												Embayed marsh	I
			A	8.00	.20		.30	1.50													
79	Deep Creek	17.00	%	50	10		5	35												Creek marsh with fringe, embayed areas	I
			A	8.50	1.70		.85	5.95													
80	Deep Creek	5.00	%	60	20		5	5	10											Embayed fringe marsh	I
			A	3.00	1.00		.25	.25	.50												

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
81	Deep Creek	24.00	%	20	35		5	40												Extensive embayed marsh with fringe	XII
			A	4.80	8.40		1.20	9.60													
82	Deep Creek	20.00	%	20	5		5	20	45								5			Trees in marsh	XII
			A	4.00	1.00		1.00	4.00	9.00									1.00			
83	Deep Creek	.50	%	50		--	30	5	15											Point marsh	I
			A	.25			.15	.03	.08												
84	Southern Branch Elizabeth River	1.00	%	50		--	40	10												Fringe marsh surrounding outer perimeter of island	I
			A	.50			.40	.10													
85	Southern Branch Elizabeth River	26.00	%	25	10	--	5	10	50											Extensive embayed marsh with fringe, spoil in area	VIII
			A	6.50	2.60		1.30	2.60	13.00												
86	Southern Branch Elizabeth River	14.00	%	50	10	--	5	5	30											Embayed marsh, trees in area	V
			A	7.00	1.40		.70	.70	4.20												
87	Southern Branch Elizabeth River	1.50	%	90		--	5	5												Fringe marsh	I
			A	1.35			.08	.08													
88	New Mill Creek	3.00	%	85	7	--	5	3	--									--		Creek marsh	I
			A	2.55	.21		.15	.09													

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
89	New Mill Creek	4.97	%	70	10	--	5	10	5											Embayed creek marsh, channelized	I
			A	3.48	.50		.25	.50	.25												
90	New Mill Creek	14.25	%	45	20	--	10	5	20				--					--		Embayed marsh, channelized	I
			A	6.41	2.85		1.43	.71	2.85												
91	New Mill Creek	8.46	%	30	20	--	5	43										1	1	Embayed marsh	V
			A	2.54	1.69		.42	3.64											.08		
92	New Mill Creek	6.38	%	30	10	--	20	40			--		--						--	Creek marsh, scattered trees	V
			A	1.91	.64		1.28	2.55													
93	New Mill Creek	25.42	%	30	10	--	20	40			--		--						--	Creek marsh, scattered trees	V
			A	7.63	2.54		5.08	10.17													
94	New Mill Creek	7.91	%	40	30	--	10	20												Extensive and embayed fringe marsh	XII
			A	3.16	2.37		.79	1.58													
95	New Mill Creek	14.97	%	40	20	--	10	20	10										--	Creek marsh	XII
			A	5.99	2.99		1.50	2.99	1.50												
96	New Mill Creek	5.16	%	30	10	--	50	10												Embayed marsh, scattered trees	IV
			A	1.55	.52		2.58	.52													

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type	
97	New Mill Creek	1.49	%	50	20		20	10													Pocket marsh	I
			A	.75	.30		.30	.15														
98	Southern Branch Elizabeth River	5.77	%	40	40		10	10													Fringe and embayed marsh	XII
			A	2.31	2.31		.58	.58														
99	Southern Branch Elizabeth River	15.90	%	30	50		10	10													Embayed marsh	III
			A	4.77	7.95		1.59	1.59														
100	Southern Branch Elizabeth River	26.50	%	30			15	50	5												Creek and embayed marsh	V
			A	7.95			3.98	13.25	1.33													
101	Southern Branch Elizabeth River	.47	%	80			5	10	5												Cove marsh	I
			A	.38			.02	.05	.02													
102	Southern Branch Elizabeth River	.73	%	10		25	40	25													Cove marsh	XII
			A	.07		.18	.29	.18														
103	Southern Branch Elizabeth River	28.43	%	20	10		30	30	10												Creek and embayed marsh	XII
			A	5.69	2.84		8.53	8.53	2.84													
104	Southern Branch Elizabeth River	44.76	%	5	10		40	30	--		1		10					1	3	Fill on marsh along river	XII	
			A	2.24	4.48		17.90	13.43			.45		4.48					.45	1.34			

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Nelderush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
105	Southern Branch Elizabeth River	34.59	%	10	10		10	70	--											Scattered pines along river	V
			A	3.46	3.46		3.46	24.21													
106	Southern Branch Elizabeth River	1.10	%	80	5		10	5												Marsh island	I
			A	.88	.06		.11	.06													
107	Southern Branch Elizabeth River	21.64	%	20	20		10	50												Large island	V
			A	4.33	4.33		2.16	10.82													
108	Southern Branch Elizabeth River	2.86	%	30	10		10	50												Marsh point area on island	V
			A	.86	.29		.29	1.43													
109	Southern Branch Elizabeth River	1.00	%	50	--		10	40												Discontinuous fringe marsh on island	I
			A	.50			.10	.40													
110	Southern Branch Elizabeth River	7.80	%	30	20		20	30												Partially filled	XII
			A	2.34	1.56		1.56	2.34													
111	Southern Branch Elizabeth River	18.25	%	50	10		10	30	--										--	Intermittent fringe creek marsh	I
			A	9.13	1.83		1.83	5.48													
112	Southern Branch Elizabeth River	72.30	%	15	13	10	10	50	2		--	--	--				--	--	--	Partially filled, landfill	V
			A	10.85	9.40	7.23	7.23	36.15	1.45												

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
113	Southern Branch Elizabeth River	2.11	%	80			7	10	3											Fringe marsh	I
			A	1.69			.15	.21	.06												
114	Southern Branch Elizabeth River	167.25	%	5	2		5	85	2		--		1					--	--	Large embayed marsh, partially impacted	V
			A	8.36	3.35		8.36	142.16	3.35					1.67							
115	Southern Branch Elizabeth River	39.80	%	5			10	80	5											Embayed marsh, partially filled	V
			A	1.99			3.98	31.84	1.99												
116	Southern Branch Elizabeth River	6.26	%	5			5	90												Pocket marsh	V
			A	.31			.31	5.63													
117	Southern Branch Elizabeth River	100.37	%	10	5		5	80					--						--	Embayed marsh, pine hummocks	V
			A	10.04	5.02		5.02	80.30													
118	Southern Branch Elizabeth River	7.57	%	80	10		5	5												Dredged channel in marsh	I
			A	6.06	.76		.38	.38													
119	Southern Branch Elizabeth River	2.39	%	80	5		5	10												Pocket marsh	I
			A	1.91	.12		.12	.24													
120	Southern Branch Elizabeth River	3.35	%	20			30	10	40											Tree hummocks	XII
			A	.67			1.01	.34	1.34												



#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
121	Southern Branch Elizabeth River	.76	%	90			10													Fringe marsh	I
			A	.68			.08														
122	Southern Branch Elizabeth River	4.37	%	70	10		10	10												Fringe marsh	I
			A	3.06	.44		.44	.44													
123	Southern Branch Elizabeth River	3.73	%	80	5	5	5		5											Fertilizer plant nearby	I
			A	2.98	.19	.19	.19		.19												
124	Southern Branch Elizabeth River	7.69	%	80			7	10	3											Fringe marsh	I
			A	6.15			.54	.77	.23												
125	Newton Creek	7.69	%	50			20	30												Creek marsh surrounded by industrial/residential development	I
			A	3.85			1.54	2.31													
126	Newton Creek	5.39	%	95			5													Creek marsh surrounded by industrial/residential development	I
			A	5.12			.27														
127	Newton Creek	12.92	%	60	5	20	10		5											Creek marsh, barrow pit open to tide	I
			A	7.75	.65	2.58	1.29		.65												
128	Newton Creek	5.37	%	90			5	5												Industrial complex	I
			A	4.83			.27	.27													

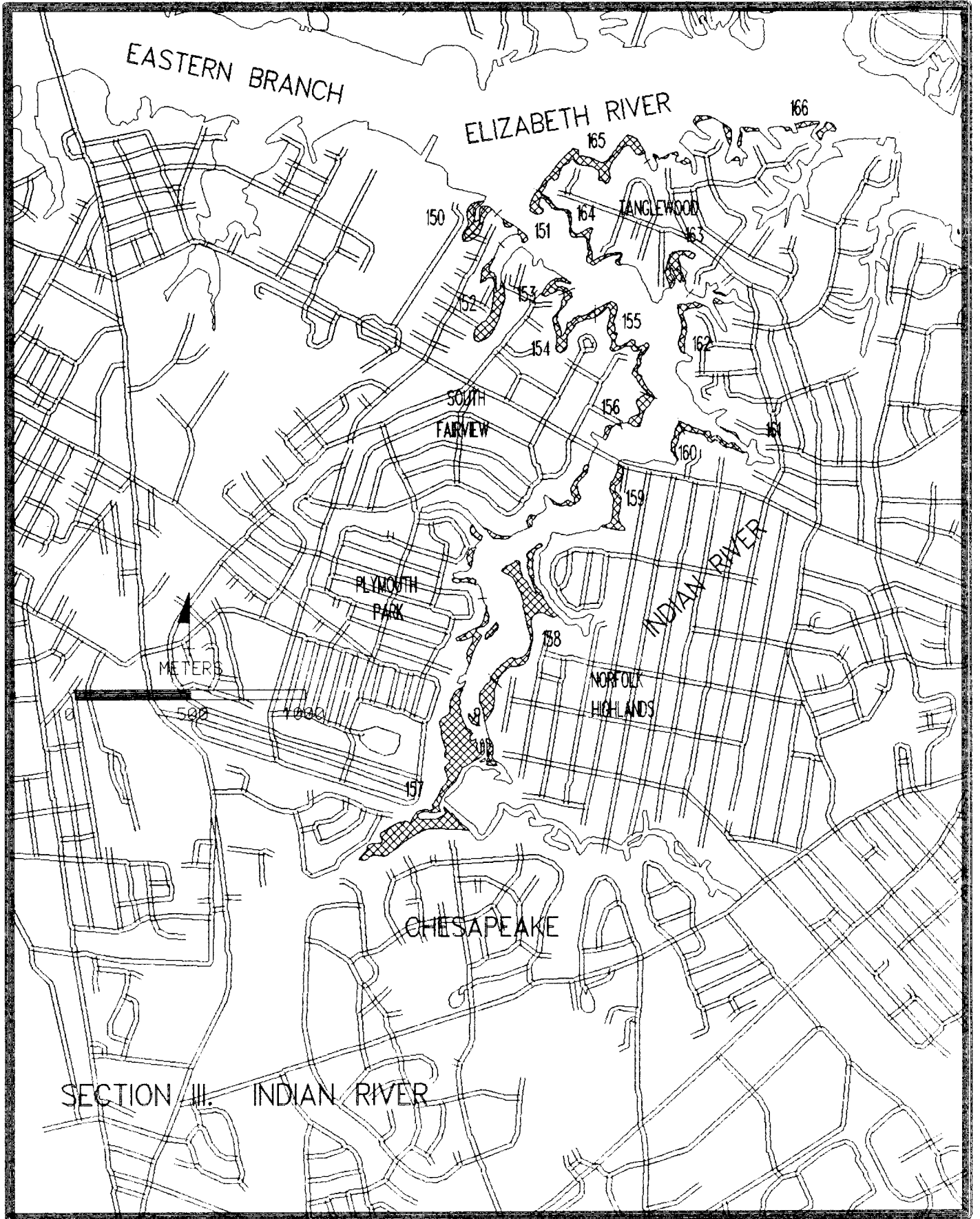
#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
129	Mill Dam Creek	15.42	%	95			2	1	1										1	Impacts from industrial/urban development	I
			A	14.65			.31	.15	.15												
130	Mill Dam Creek	1.99	%	90			10													Impacts from industrial/urban development	I
			A	1.79			.20														
131	Mill Dam Creek	2.38	%	95			2	2											1	Impacts from industrial/urban development	I
			A	2.26			.05	.05													
132	Mill Dam Creek	6.34	%	30	30		40	--												Impacts from industrial/urban development	XII
			A	1.90	1.90		2.54														
133	Mill Dam Creek	37.51	%	60	30		10													Impacts from industrial/urban development	I
			A	22.51	11.25		3.75														
134	Mill Dam Creek	8.78	%	85			5	5	5											Impacts from industrial/urban development	I
			A	7.46			.44	.44	.44												
135	Mill Dam Creek	13.25	%	20	5		25	50												Impacts from industrial/urban development	V
			A	2.65	.66		3.31	6.63													
136	Mill Dam Creek	9.27	%	.10			90													Impacts from industrial/urban development	IV
			A	.93			8.34														

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
137	Mill Dam Creek	10.40	%	90	1		7	1	--				--						1	Impacts from industrial/urban development	I
			A	9.36	.10		.73	.10													
138	Mill Dam Creek	6.30	%	90			10													Impacts from industrial/urban development	I
			A	5.67			.63														
139	Southern Branch Elizabeth River	.36	%	50			20	30												Small pocket marsh	I
			A	.18			.07	.11													
140	Gilligan Creek	2.23	%	85	1		4		10											Fringe and point marsh	I
			A	1.90	.02		.09		.22												
141	Gilligan Creek	8.20	%	90			5		5											Creek marsh	I
			A	7.38			.41		.41												
142	Gilligan Creek	3.52	%	85	1		5		9											Small embayed marsh	I
			A	2.99	.04		.18		.32												
143	Gilligan Creek	.95	%	80			20													Fringe marsh	I
			A	.76			.19														
144	Jones Creek	1.37	%	80			20													Fringe marsh	I
			A	1.10			.27														

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Nodderush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
145	Jones Creek	3.45	%	90			5		5											Small pocket marsh	I
			A	3.11			.17		.17												
146	Jones Creek	2.28	%	90			5		5											Pocket marsh	I
			A	2.05			.11		.11												
147	Scuffletown Creek	1.67	%	85			8		5	2										Long fringe marsh	I
			A	1.42			.13		.08	.03											
148	Scuffletown Creek	4.64	%	90			5		5											Fringe marsh	I
			A	4.18			.23		.23												
149	Scuffletown Creek	3.59	%	90			5		5											Cove marsh	I
			A	3.23			.18		.18												
T	Total Section II	1233.97	%																		
			A	458.42	108.66	11.61	129.99	461.29	53.70	.03	.45		6.15					1.00	1.13		
			%																		
			A																		
			%																		
			A																		

**Section III**

**Eastern Branch of the Elizabeth River**



### III. Eastern Branch of the Elizabeth River.

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
150	Indian River	2.00	%	90			8	2												Cove marsh	I
			A	1.80			.16	.04													
151	Indian River	.25	%	60		35	3				2									Spit marsh	I
			A	.15		.09	.01			.01											
152	Indian River	5.00	%	95			5													Small creek marsh	I
			A	4.75			.25														
153	Indian River	2.00	%	95			5													Spit and cove marsh	I
			A	1.90			.10														
154	Indian River	5.00	%	95			5													Fringe and cove marsh	I
			A	4.75			.25														
155	Indian River	1.32	%	90			10	--	--											Fringe marsh	I
			A	1.18			.13														
156	Indian River	1.00	%	85	5		8	2												Fringe marsh	I
			A	.85	.05		.08	.02													
157	Indian River	56.00	%	20			30	40		2			2					5	1	Creek marsh	XII
			A	11.20			16.80	22.40		1.12			1.12					2.80	.56		

#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
158	Indian River	8.00	%	60			35	5												Point and cove marsh	I
			A	4.80			2.80	.40													
159	Indian River	.81	%	90			5	--		5										Fringe marsh	I
			A	.73			.04			.04											
160	Indian River	.25	%	80			15			5										Fringe marsh	I
			A	.20			.04			.01											
161	Indian River	.50	%	95			5												--	Fringe marsh	I
			A	.48			.02														
162	Indian River	.50	%	70			20	10												Fringe marsh	I
			A	.36			.10	.04													
163	Indian River	1.00	%	90			8	--					1		1					Cove marsh	I
			A	.90			.08				.01		.01								
164	Indian River	4.00	%	92	2		6	--							--					Fringe marsh	I
			A	3.68	.08		.24														
165	Eastern Branch Elizabeth River	3.10	%	85			8	5							2					Fringe marsh	I
			A	2.64			.25	.16						.06							



#	Marsh Location	Total Acres		Saltmarsh Cordgrass	Black Needlerush	Saltmeadow Grass	Saltbush	Big Cordgrass	Reedgrass	Cattails	Marsh Fleabane	Marsh Mallow	Saltmarsh Aster	Saltmarsh Bulrush	Smartweed	Spikerush	Switch Grass	Orach	Water Hemp	Observations	Marsh Type
166	Eastern Branch Elizabeth River	.25	%	100																Marsh island	I
			A	.25																	
T	Total Section III	90.98	%																		r
			A	40.62	.13	.09	21.35	23.06		1.17	.01		1.13		.07				2.80		
GT	GRAND TOTAL	1746.24	%																		
			A	648.61	118.53	39.59	279.46	573.12	59.71	1.86	1.77	.46	7.94	.25	.07	.42	1.00	6.31	7.35		
			%																		
			A																		
			%																		
			A																		
			%																		
			A																		



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