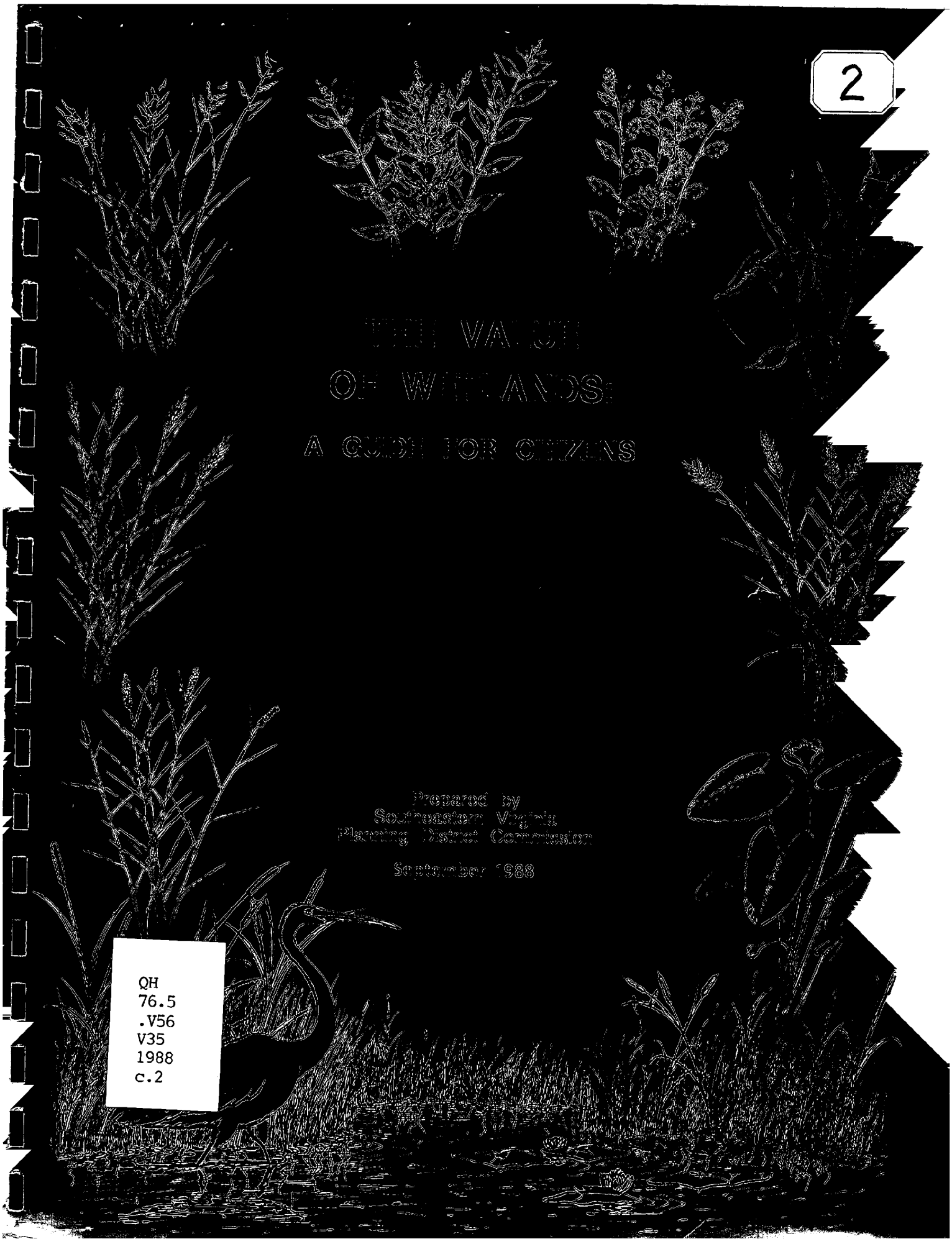
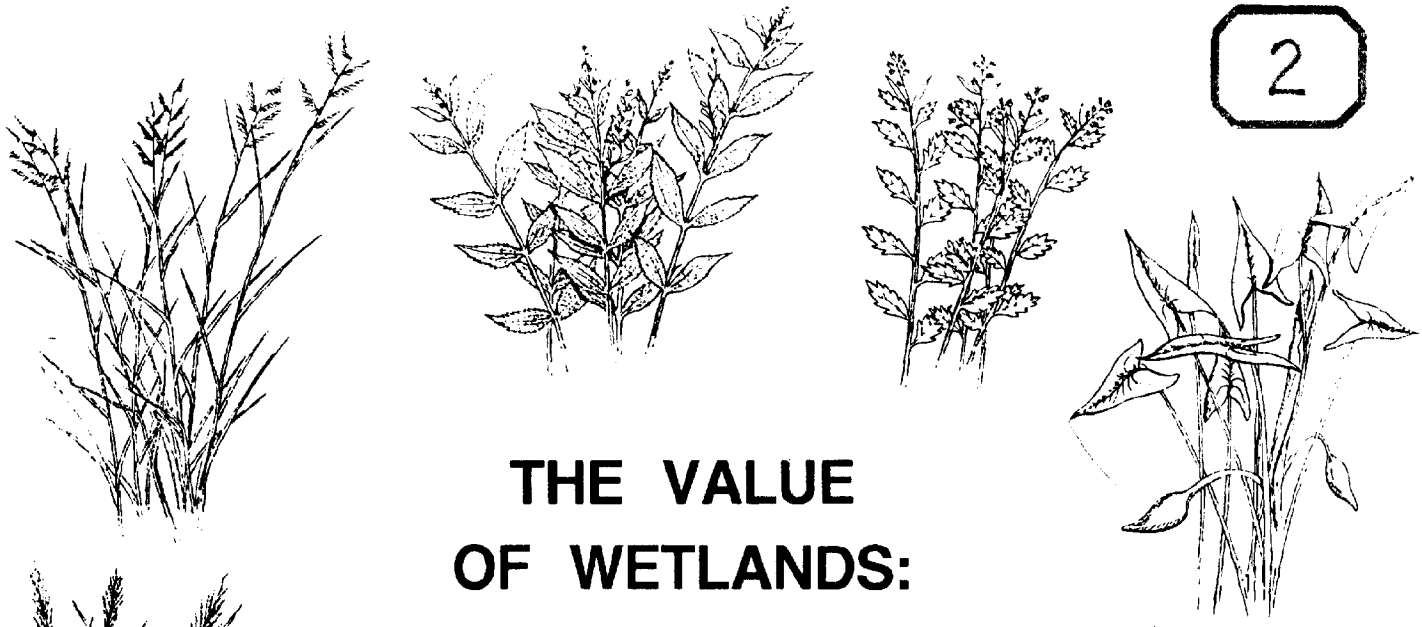
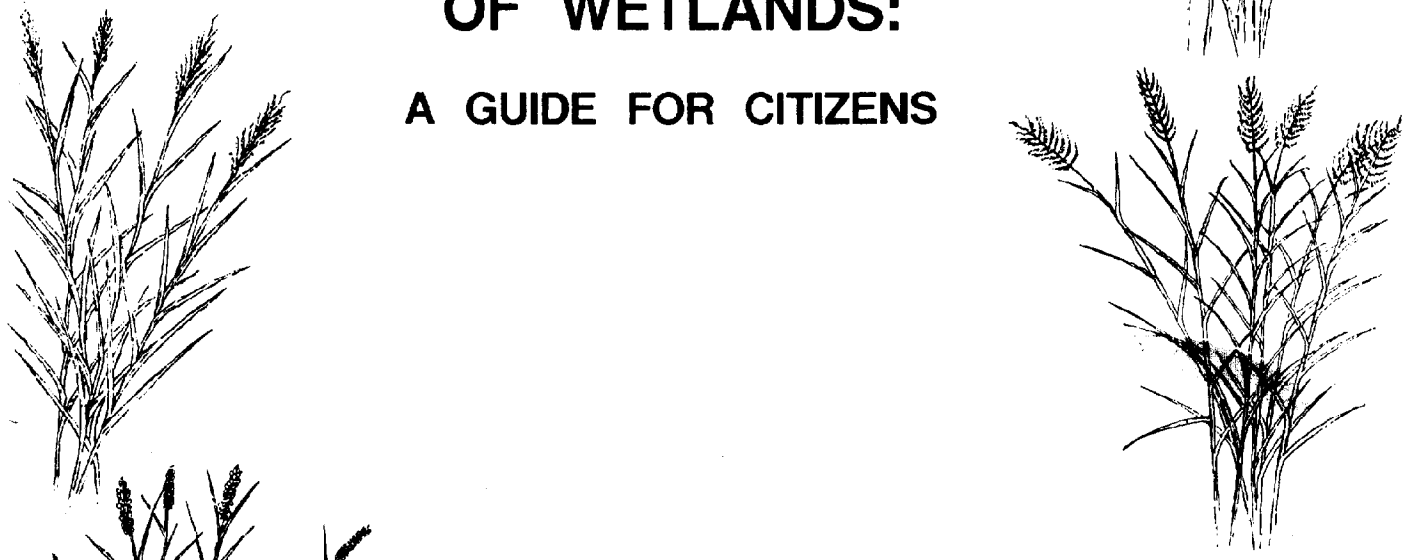




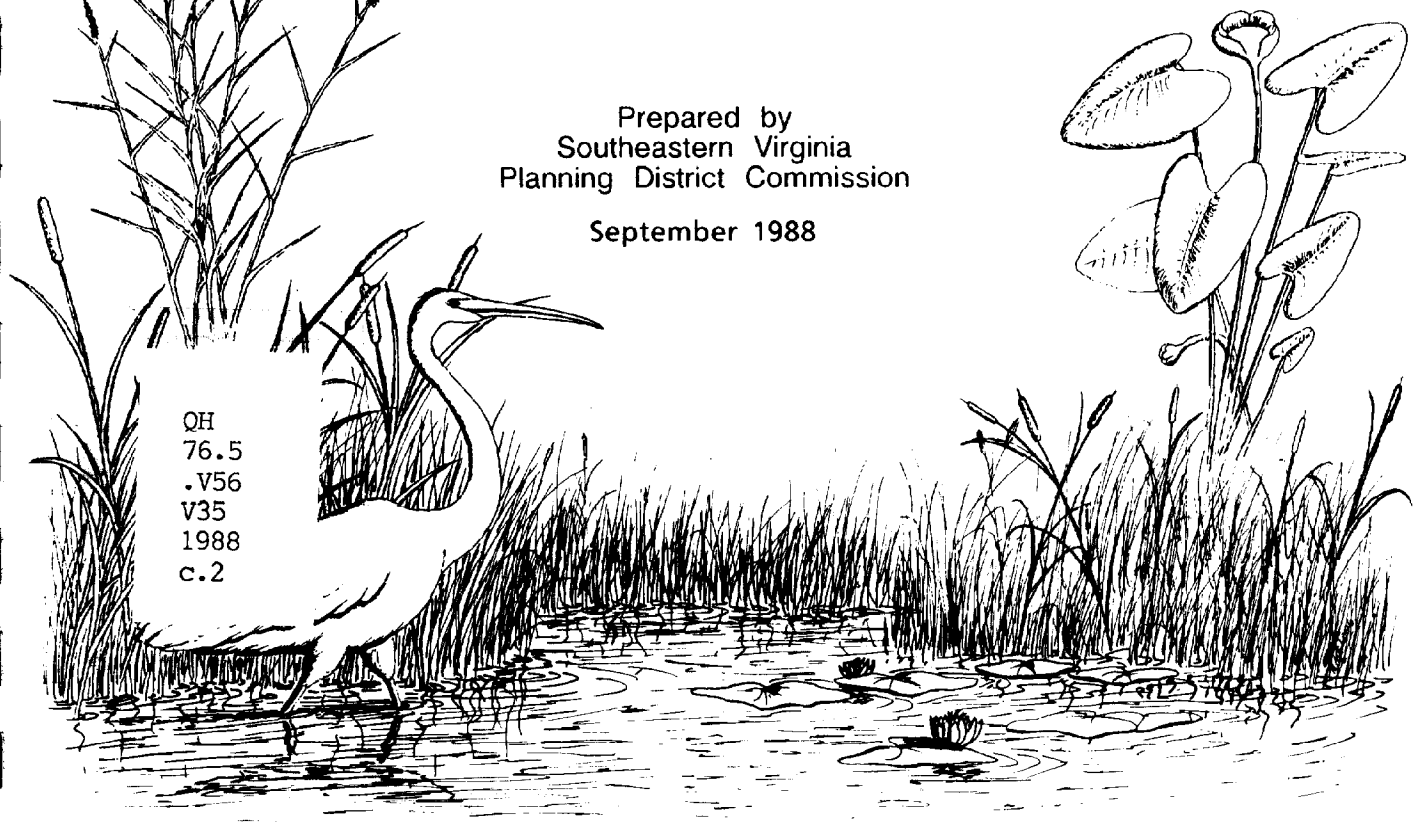
THE VALUE OF WETLANDS:

A GUIDE FOR CITIZENS



Prepared by
Southeastern Virginia
Planning District Commission

September 1988



THE VALUE OF WETLANDS:

A GUIDE FOR CITIZENS

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Prepared by the Staff of the
Southeastern Virginia Planning District Commission

September 1988

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

"The ribbon of green marshes, part solid land, part mobile water, has a definite, but elusive border, now hidden, now exposed, as the tides of the Atlantic fluctuate. At one place and tide there is a line at which you can say, 'Here begins the marsh.' At another tide, the 'beginning of the marsh,' is completely inundated and looks as though it had become part of the sea. The marsh reaches as far inland as the tides can creep and as far into the sea as marsh plants can find a roothold and live in saline waters."

Teal and Teal, Life and Death
of the Salt Marsh

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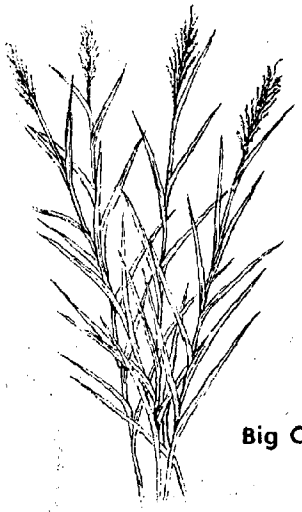


Big Cordgrass

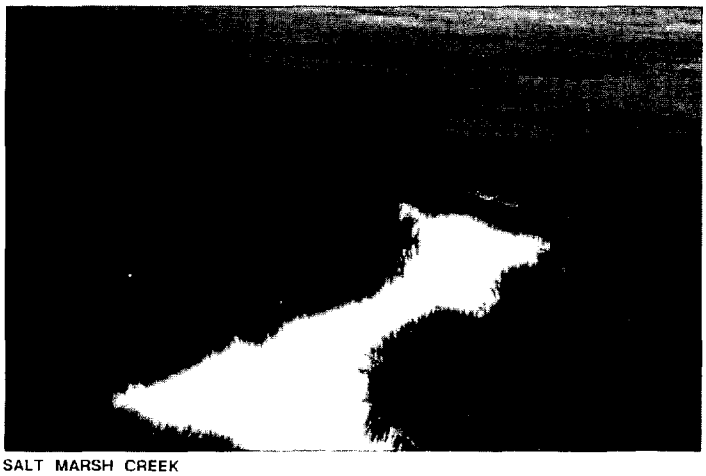
INTRODUCTION

Wetlands are an important physical feature throughout the world. They are found in tropical and polar climates and may even be found in the desert. They are particularly important features of the coastal areas of the United States, including the Chesapeake Bay.

For centuries, man considered wetlands to be undesirable due to their wetness, the presence of insects, and the wild and forbidding character of many, especially the forested ones. In American history, these areas were to be drained so that they could become "productive lands." When George Washington surveyed Southeastern Virginia's Great Dismal Swamp, it was for the purpose of laying out drainage canals. Because of its swampy character, Washington, D.C. was originally considered to be a very undesirable place to live. The Civil War's Peninsula Campaign was waged in the forested wetlands and swamps of the upper York-James Peninsula and the Chickahominy River floodplain. Throughout American urban development, wetlands were generally considered to be the least desirable lands and, thus, the areas most suitable for the least desirable urban activities, like dumps and junkyards.

Wetlands are much better understood today for both the values they possess and the hazards which they pose for development and human habitation. These values and hazards are inextricably intertwined.

This Guide describes the values of and the hazards associated with unwise development of the wetlands resource. It describes the regulatory system and permit process which has been devised to protect them. Techniques which can be used by individual residents and developers are described. A number of sources of technical assistance on wetlands development and protection are identified. This Guide should increase understanding of Virginia's wetlands resources and the regulatory process governing development which may affect them.



WALTER I. PRIEST, III

SALT MARSH CREEK

WHAT IS A WETLAND

Most simply, a wetland is an area of wet soils, where water is normally found at or on the surface of the land. The U.S. Fish and Wildlife Service defines wetlands as:

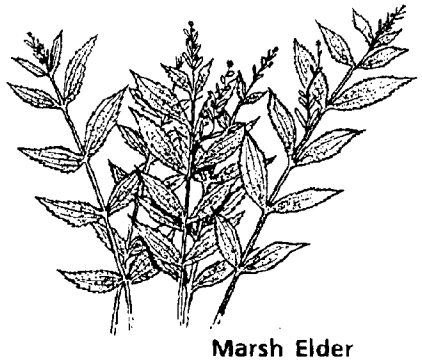
> "land where saturation with water is the dominant factor determining the nature of soil development and the types of plants and animal communities living in the soil and on its surface."

These lands provide the transition between land and water-based environmental communities. They must have the following characteristics:

1. "at least periodically, the land supports predominantly hydrophytes (plants that are adapted to growing in water or saturated soils);
2. "the substrate is predominantly undrained hydric soil (wet soils); and,
3. "the substrate is not soil and is saturated with water or covered by shallow water at some time during the growing season of each year."

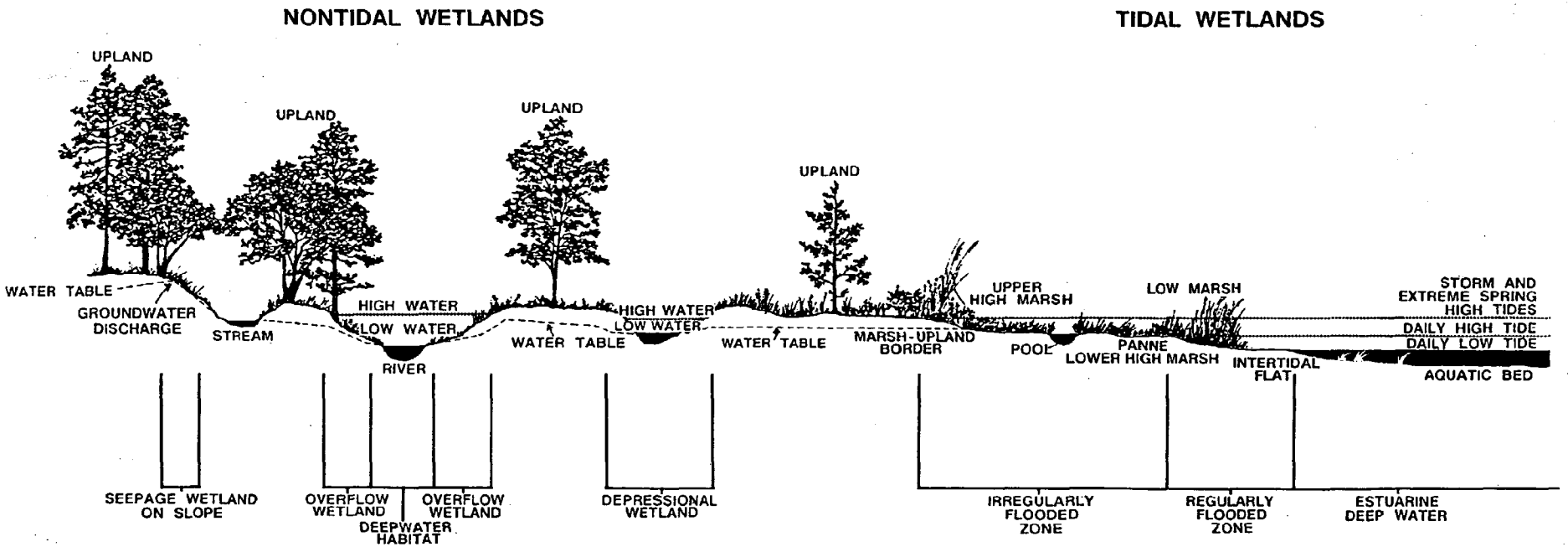
This definition, developed by the Fish and Wildlife Service, serves as the basis for federal law and regulations governing development in both tidal and nontidal wetlands.

Through the Wetlands Act of 1972 (Title 62.1 of the Code of Virginia), the Commonwealth defined tidal wetlands for the purposes of protecting the resource and regulating development. Under the Virginia definition, wetlands are found in the forty-six cities and counties of Tidewater, roughly all localities east of Interstate 95. Vegetated wetlands are defined as "all land lying between and contiguous to mean low water and an elevation above mean low water equal to the factor 1.5 times the mean tide range at the site of the proposed project in the county, city or town in question;" and on which are growing one or more of thirty-seven species of wetlands vegetation. Nonvegetated wetlands are defined as all other lands between mean low and mean high water. These regulatory definitions do not include nontidal wetlands and may not include all lands which are considered to be wetlands under the federal definition.



Marsh Elder

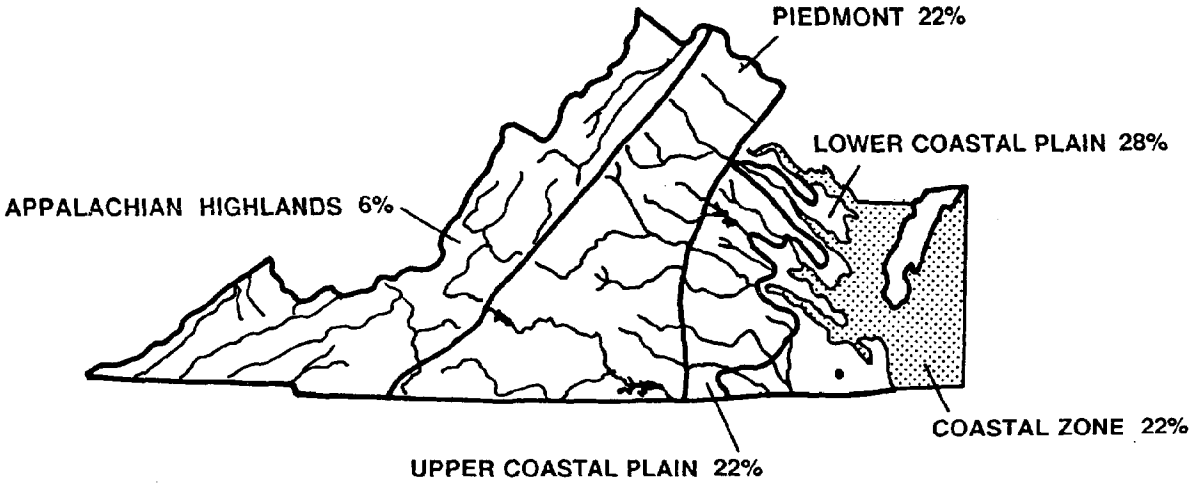
SCHEMATIC OF WETLANDS TYPES



Wetlands, known as swamps, bogs, pocosins, salt marshes, marshes, and tidal marshes, are found throughout Virginia. They are found along tidal creeks and rivers and adjacent to islands in larger bays, wherever the tide regularly floods the land. They also occur along freshwater streams, in flood plains and areas of poor drainage. Wetlands may be found in depressions where groundwater intersects the surface. The shallow fringes of ponds and lakes are also wetlands. They may be vegetated or, especially in tidal areas, may be nonvegetated mudflats.

Two wetland types dominate the coastal areas of Virginia. The first of these are tidal wetlands, which owe their existence to the regular action of the tide. These wetlands may be nonvegetated or vegetated with grasses. The Coastal Plain also contains extensive areas of nontidal wetlands, which may be located adjacent to the tidal marshes as well as farther inland. Most of these are forested and are found primarily along the region's innumerable rivers and streams. Wherever wetlands are found, the soils are saturated with water most of the time.

DISTRIBUTION OF WETLANDS IN VIRGINIA

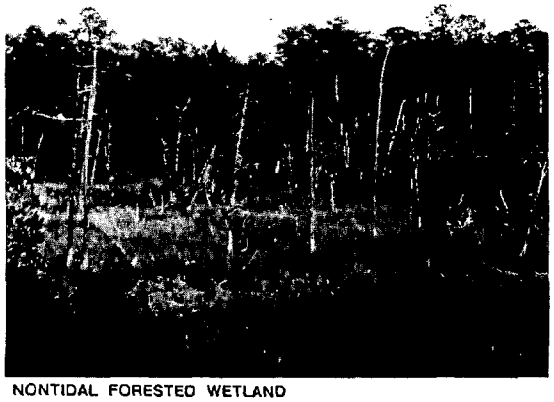


Source: Tiner, Ralph W., Jr. Mid-Atlantic Wetlands: A Disappearing Natural Treasure, FWS, 1987.

VIMS

TIDAL MARSH

Tidal wetlands, both vegetated marshes and nonvegetated beaches, sandflats and mudflats, are the most widely recognized of the Coastal Plain's wetlands. They are dominated by tidal action, being flooded regularly. The vegetated marshes are also characterized by salt marsh grasses, such as Smooth Cordgrass, Salt Meadow Grass, Giant Cordgrass, Black Needlerush and others. Shrubs, such as Saltbush and Buttonbush, are found along their upper edges, those parts which are not flooded on each tidal change. The Virginia Wetlands Act lists thirty-seven species of plants that are characteristic of tidal wetlands communities.



SVPDC

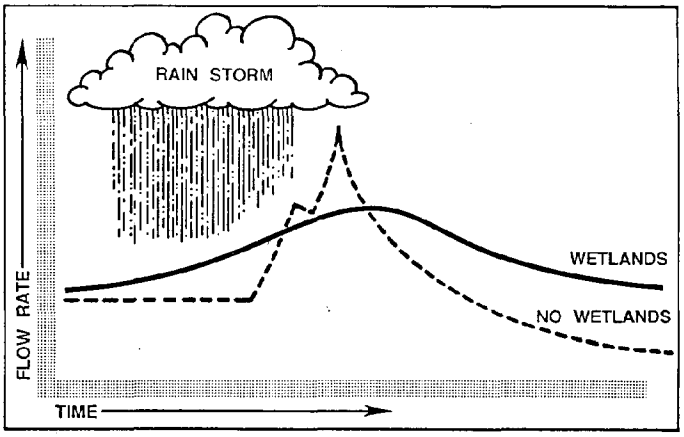
NONTIDAL FORESTED WETLAND

The nontidal wetlands are less easily recognized. During parts of the year, these areas may not have any surface evidence of the presence of water. Common trees such as Red and Silver Maple, Black and Sweet Gum, Pin and Willow Oak, Green Ash, Cedar and Bald Cypress are typically found in forested wetlands. Willow, Alder, Buttonbush and some Dogwoods are found in shrub wetlands. Emergent wetlands are characterized by various grasses, Cattails, some Asters and Goldenrod.

WETLANDS VALUES

Flood Conveyance and Storage

Where wetlands occupy the flood plains, they permit floods to pass without damage to human structures. When flooded, wetlands provide temporary storage of the flood waters, releasing them slowly and reducing peak downstream flows. When wetlands are removed, downstream flood levels rise and reach significant peaks much faster.



Source: Kusler, Jon A. Our National Wetland Heritage: A Protection Guidebook, ELI, 1983.

Coastal Hazard Protection

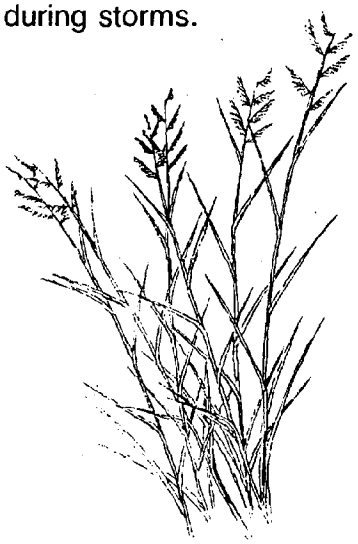
Tidal wetlands exist because they are regularly flooded by the tide. They are a buffer between the upland and the sea. Waves break on the marsh. The mat of roots and dead vegetation binds the soil and absorbs wave energy before the waves reach the upland. Nonvegetated wetlands also protect the shoreline by absorbing and dissipating wave energy. As a result, erosion of the adjacent upland is reduced. Elimination of the wetland allows all of a wave's energy to reach and erode the upland. Since most structures are located on the upland, the wetlands provide an important measure of protection for them, especially during storms.

VIMS

MARSH VEGETATION AND DETRITUS

Sediment Control

Excess sediment in estuarine waters causes a number of problems. It reduces the penetration of light into the water, thus reducing plant growth. It smothers bottom-dwelling organisms, such as oysters and clams. As sediments settle to the bottom, they also reduce water depth and increase the need or desire for dredging.



Saltmeadow Cordgrass

Wetlands reduce flood flow and velocity, reducing erosion damage and causing the floodwaters to deposit sediment and other materials. The marsh grasses also filter sediment from the waters. The roots of the marsh vegetation bind the soil in place and prevent further erosion of the site. The deposited materials quickly become part of the marsh, enabling it to collect additional material and to grow. Filter feeding organisms, found in the nonvegetated wetlands, also remove suspended solids from the water. This reduces sediment input to the adjacent waters including the Chesapeake Bay and its tributaries.

Pollution Control

As they trap and collect sediment, the vegetated wetlands also trap pollutants contained in the runoff. Wetland plants use nutrients rapidly during the growing season. It has been estimated that a high quality wetland can remove more than 90% of the nitrogen and phosphorus contained in stormwater runoff. The states in the Chesapeake Bay Basin have established a goal of reducing loadings of these pollutants to the Bay by 40% before the year 2000. Thus, it is obvious that wetlands can aid significantly our water quality improvement programs. There is also evidence that wetlands can remove metals from runoff and retain them in the marsh. However, the ability of wetlands to perform the pollution control function is limited. Once the limit is exceeded, the wetlands will begin to deteriorate.

Habitat and Food Source

Most wetlands are extremely productive habitats. Wetland plants transform nutrients into forms which are readily usable by aquatic organisms. Scientific studies have shown that Smooth Cordgrass marshes may produce as much as 10 tons of food material per acre. They also provide cover for wildlife, enabling many species to travel in relative safety and to escape when necessary. Nonvegetated tidal wetlands, especially those adjacent to extensive marsh areas, are important feeding, spawning and nursery areas for fish and shellfish. It has been estimated that nearly three-fourths of the commercial and sport fish and shellfish harvest in the Chesapeake Bay region is dependent on the estuary. Tidal wetlands are linked directly to the high productivity of Bay waters. Declines in waterfowl population along the Atlantic Flyway have been linked, in part, to declines in marsh acreage. Thirty-five percent of the nation's rare and endangered species can be found in wetland habitats. Fourteen such species can be found in the Chesapeake Bay's wetlands alone.

VMRC

TONGING FOR OYSTERS

Recreation

More than fifty percent of the nation's population regularly participates in water dependent recreational activities. These include boating, swimming, fishing and hunting. Nearly 30,000,000 Americans participate in nature study, wildlife photography and related activities, which are, at least in part, dependent on wetlands.

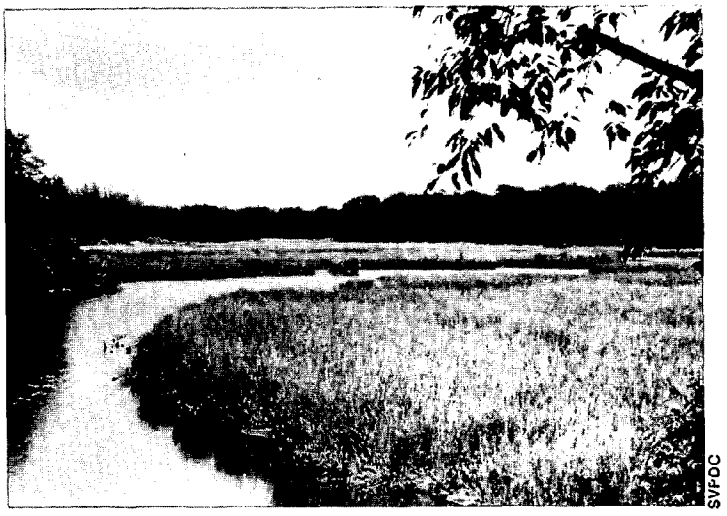
RAGGED ISLAND WMA

Water Supply

As they slow flood waters, some wetlands permit water to seep into the ground, recharging the groundwater. They help to purify this water by trapping sediments and other pollutants. This natural recharge is very important to coastal communities that are partially dependent on groundwater for drinking and other purposes.

Food and Timber Production

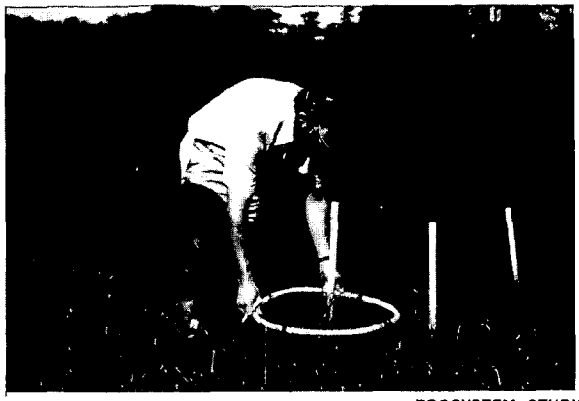
As might be expected of lands that trap and remove nutrients from runoff, wetlands are highly productive. This productivity, typically seen as lush growth of vegetation, is integral to most aquatic food chains. Historically, wetlands were used for pasture and the production of hay. Wetland grasses are very effective mulches. Highly valuable timber lands are found in many wetland areas. Increasingly, as man turns to aquaculture for the production of fish and shellfish, the value of wetlands in fish production will be more fully appreciated.



TIDAL MARSH WITH FOREST BORDER

Education and Research

Wetlands are valuable sites for nature study and other forms of environmental education. Wetlands should be maintained as a reserve for scientific study and evaluation of environmental protection options.



WALTER I. PRIEST, III

ECOSYSTEM STUDY

Historic and Archaeological Sites

Throughout the wetlands of coastal Virginia, one can find sites with great historic value. The remains of coastal Indian villages have been found in wetlands. Many important battles from the settlement of Jamestown through the Civil War were fought in wetlands. The Great Dismal Swamp and other nontidal swamps were important routes and hiding places for escaping slaves. Archaeological investigations would be required to pinpoint the actual sites of many of these historic activities.

Open Space and Aesthetics

Wetlands provide important open spaces in and around developing urban areas. They buffer incompatible land uses, provide shape and definition to urban form and contribute to the increased value associated with urban lands which abut open spaces and waterbodies.

SVPDC

TIDAL MARSH IN SUBURBIA

WETLANDS HAZARDS

Development in wetlands also presents considerable direct hazard to man.

Flood Damage

Wetlands may be regularly flooded by ocean tides and rivers. Obviously, regular flooding is incompatible with human habitation. As indicated earlier, the wetlands store flood waters and absorb wave energy, protecting adjacent and downstream properties. When wetlands are filled, water storage and recharge is reduced and downstream runoff increases. When seawalls are used instead of wetlands for erosion protection, flood heights rise and erosion rates may actually increase. Structures which are damaged during floods contribute floating debris and result in more damage.

Erosion Potential

When vegetation is removed from the wetlands, the soils are exposed to erosion. Erosion in these areas, once the vegetation has been removed, is typically rapid. The loss of the vegetation and its filtering ability increases sedimentation to the adjacent waterbody.

Poor Structural and Foundation Conditions

Wetland soils readily compact under the weight of structures. As organic matter in the soil decomposes, the soils settle further, but at differing rates. This results in foundation cracks and may result in the loss of the strength and integrity of structures, which are located on them.

Unsuitable Soils for Waste Disposal

Individual septic tanks and other onsite waste disposal systems do not work well in wetland soils, because of the presence of water in the soil. Wastes are frequently found on the surface of the ground under such conditions. This situation presents a significant hazard to human health. Use of wetlands for land disposal of solid wastes is incompatible with the many valuable functions which wetlands serve.

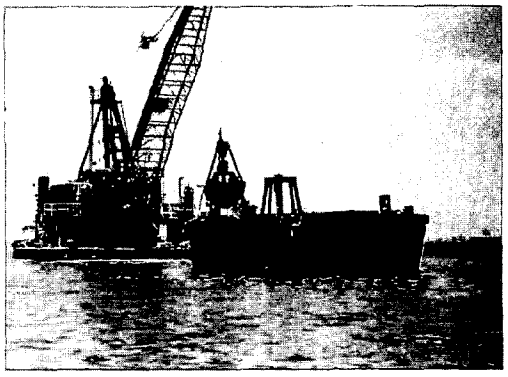
WALTER I. PRIEST, III

WASTE DISPOSAL IN TIDAL WETLAND

STATUS OF WETLANDS

Man's activities have the potential to destroy the wetlands and eliminate the important functions that they perform. Some of this destruction is intentional, while much of it is a matter of accident or ignorance. Wetlands are lost through:

- Drainage for crop and timber production and mosquito control
- Dredging and stream channelization
- Diversion of freshwater inflow for irrigation and flood control
- Construction of dikes, dams, levees, seawalls and bulkheads
- Filling for development
- Discharge of waste materials into or onto the wetlands
- Water withdrawal from both surface and groundwater
- Mineral extraction which results in disturbing wetland soils
- Natural causes, including erosion, storm damage and subsidence.

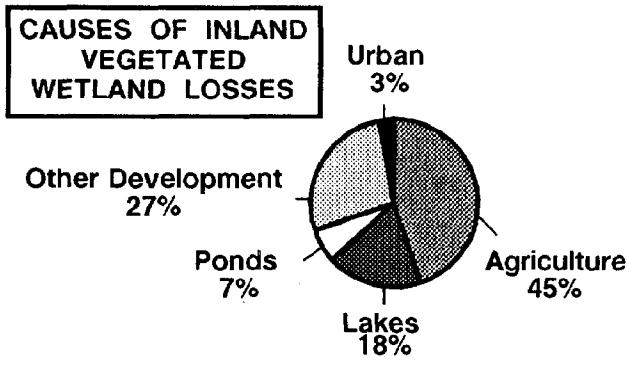


WALTER I. PRIEST, III

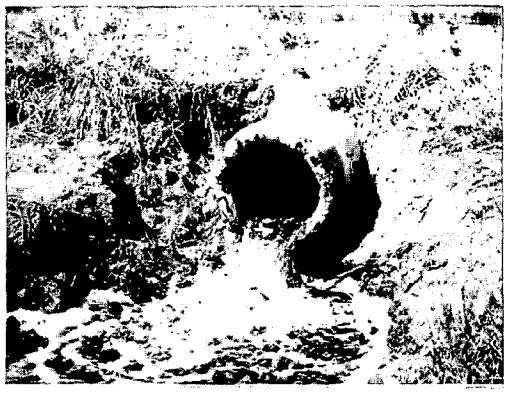
DREDGING IN THE ELIZABETH RIVER

WALTER I. PRIEST, III

DREDGING AND FILLING FOR RESORT DEVELOPMENT

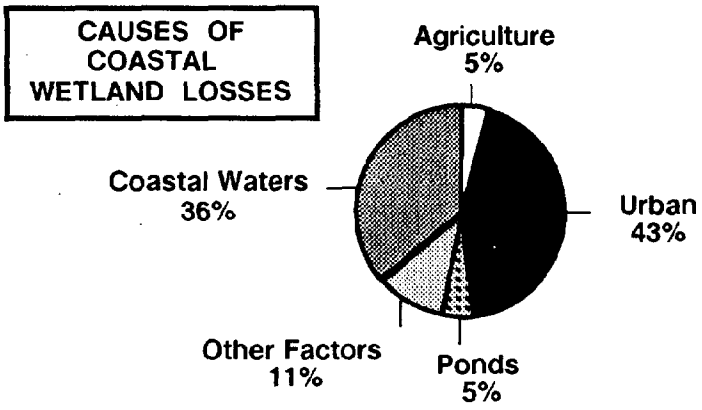


Source: Tiner, Ralph W. Mid-Atlantic Wetlands: A Disappearing Natural Treasure. FWS, 1987.



VIMS

WASTE DISCHARGE TO MARSH CREEK



Source: Tiner, Ralph W. Mid-Atlantic Wetlands: A Disappearing Natural Treasure. FWS, 1987.

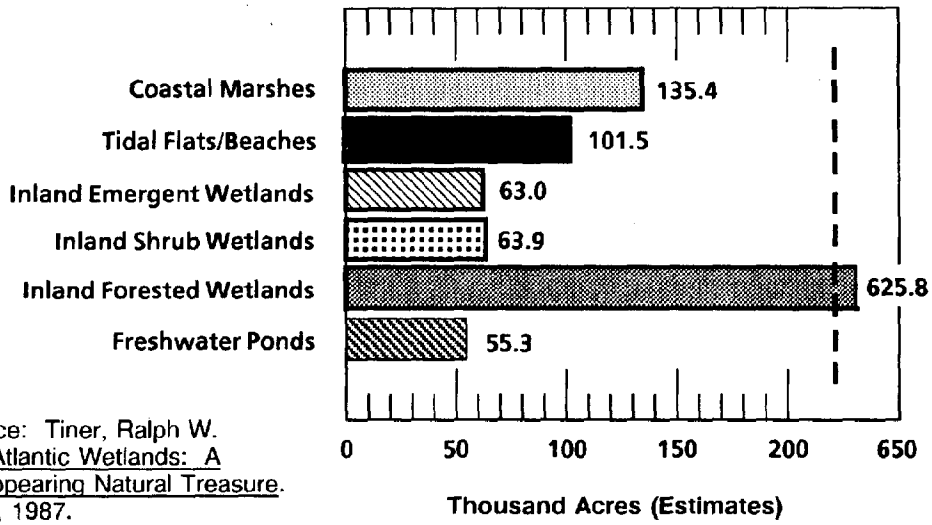
Man's activities can hasten the adverse effects of these natural occurrences by reducing the health of wetlands vegetation, increased sedimentation, sea level rise due to the "greenhouse effect" and so forth.

A recent study by the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service indicates that Virginia has more than 1,000,000 acres of wetlands. About 25% of these are tidal wetlands, both vegetated and nonvegetated. Nearly 75% of the State's wetlands are nontidal wetlands. The preponderance of Virginia's wetlands, both tidal and nontidal, are found in the Coastal Plain.

It has been estimated that nationally more than 50% of the wetlands present at the time of the Revolution have been lost. During a twenty-year period from 1956 to 1977, Virginia lost nearly 6% of its total wetland area. Eighty percent of these losses occurred in the Coastal Plain. The most threatened wetland type was the inland forested wetland. The greatest threat to coastal wetlands is urbanization, while agriculture poses the greatest threat to inland wetlands. This situation is representative of what has and is happening to wetlands throughout the Chesapeake Bay region.

As wetlands are lost, so are their valuable functions. Flood control capacity is reduced; runoff, sedimentation and pollution are increased; groundwater recharge is reduced; fish and wildlife habitat are destroyed; and educational and recreational opportunities are foreclosed.

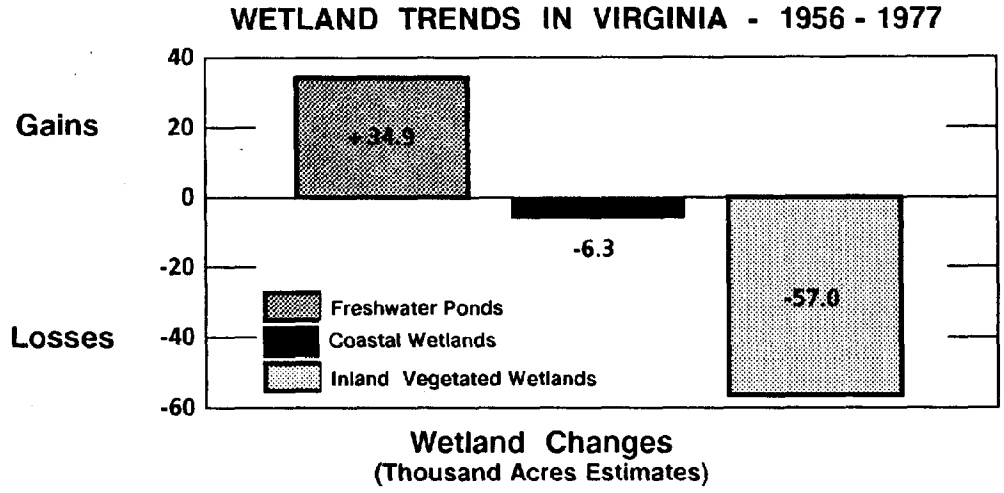
CURRENT STATUS OF WETLANDS IN VIRGINIA



Source: Tiner, Ralph W. Mid-Atlantic Wetlands: A Disappearing Natural Treasure. FWS, 1987.

These losses do not occur without cost. The costs, both direct and indirect, of development in the wetlands may be greater than the costs of development elsewhere. Direct costs include those incurred by the individual landowner for fill material, construction techniques necessitated by the poor soils of the wetlands and measures necessary to mitigate the hazards of development. Indirect costs include those incurred by other property owners and governmental agencies to replace such lost functions as flood storage, erosion and pollution control and wildlife habitat. Although regulatory programs frequently require impact mitigation and/or wetlands replacement, there is debate in the regulatory and scientific community about the desirability and effectiveness of such programs. In particular, it is not known whether man-made wetlands perform these valuable functions as effectively over time as do natural wetlands. The long-term costs of creating a new wetland and monitoring its effectiveness may exceed the cost of maintaining the existing wetlands in the first place.

Yellow Pond Lily

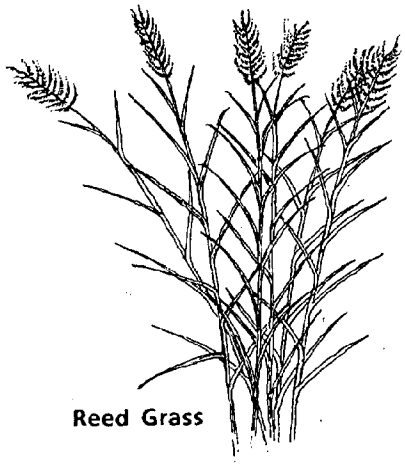


Source: Tiner, Ralph W. Mid-Atlantic Wetlands: A Disappearing Natural Treasure. FWS, 1987.

WETLANDS REGULATION

State, local and federal governments have all enacted programs to regulate development in wetlands. The Virginia Wetlands Act of 1972 recognizes "the unique character of the wetlands, an irreplaceable resource which, in its natural state, is essential to the ecological systems of the tidal rivers, bays and estuaries of the Commonwealth." It is the policy of the Commonwealth "to preserve wetlands to prevent their despoliation and destruction and to accommodate necessary economic development in a manner consistent with wetlands preservation." Under the Act, a permit is required before most types of development in a tidal wetland can proceed. This Act, which originally applied only to vegetated tidal wetlands, was subsequently amended to include the wetlands of Back Bay and the North Landing River which are subject to wind tides. It was amended again in 1982 to cover nonvegetated tidal wetlands as well. Related coastal resources, such as sand dunes and beaches and subaqueous lands, are protected in Virginia through the Coastal Primary Sand Dune Protection Act and laws governing development on subaqueous lands, which are owned by the Commonwealth.

Development control to protect the tidal wetlands of Virginia is a joint responsibility of the Commonwealth and its local governments. The Virginia Marine Resources Commission (VMRC) is the state agency with primary responsibility for this program. Local governments are allowed to establish and administer their own regulatory programs through local Wetlands Boards and ordinances.


Reed Grass

VMRC

ILLEGAL DUMPING IN TIDAL CREEK

which conform to the model state legislation. Where local governments do not do this, the VMRC is the permitting authority for development in wetlands, dunes and beaches. Although considered at great length by the General Assembly during its 1988 Session, legislation to establish a program to regulate development in nontidal wetlands was carried over to the 1989 Session. There is currently no Virginia regulatory program governing development in nontidal wetlands.

Federal regulation of wetlands development applies to both tidal and nontidal wetlands. It is accomplished under the requirements of the Clean Water Act as well as the Rivers and Harbors Act of 1899. The U.S. Army Corps of Engineers (COE), in cooperation with the U.S. Environmental Protection Agency (EPA), administers the federal program to regulate certain activities in wetlands. Generally, all development within bodies of water and wetlands, which are defined as Waters of the United States, requires a permit from the Corps of Engineers. All applications for permits from the COE require coordination with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and other advisory agencies. Under the federal permit program, EPA may veto a decision by the COE to approve a project. In addition, all projects requiring a permit from the Corps of Engineers must receive a certification from the State Water Control Board that the project will not have a significant adverse water quality impact. Finally, the Corps of Engineers has issued a number of General and Regional Permits for projects which tend to be small, noncontroversial and/or have minor impacts. These Permits are applied to specific projects subject to the applicant obtaining the necessary state or local wetlands permits.

THE PERMIT PROCESS

While a permit process which involves local, state and federal agencies would appear to be cumbersome, steps have been taken to reduce the burden on citizens through establishment of a joint permit process. This process results in close coordination and cooperation among the regulatory agencies and reduces the time involved in obtaining a permit.

The joint permitting process greatly simplifies the task of obtaining regulatory permits for projects affecting wetlands for individual citizens. Only one application form needs to be completed and submitted to the Virginia Marine Resources Commission for most projects. Although the application package contains nearly 60 pages of material, the applicant is expected to complete only those portions which apply directly to his project. VMRC assigns a processing number to the project, which is used by all of the regulatory agencies. Copies of the application are then forwarded to the Corps of Engineers and to the local Wetlands Board for processing. Although consideration of a project is undertaken concurrently, some permits may take longer to obtain than others due to differing legal requirements and project complexity.

A joint public notice is prepared for each project by the Corps of Engineers. If a project does not require a permit from the COE or qualifies for a COE General or Regional Permit, individual public notices are prepared by each of the other regulatory agencies. The notice is circulated to adjacent property owners, governmental agencies and others who have requested the opportunity to review and comment. Legal notices are placed in the local newspaper by the state and local regulatory agency and the applicant is billed for the cost of the ad. Comments may be received from any of the reviewing agencies or individuals.

All of the wetlands regulatory programs generally require a site inspection prior to issuance of a permit. These are conducted jointly, where possible, by the VMRC, COE and local Wetlands Board. Staff from the Virginia Institute of Marine Science and other technical advisors to the regulators may also participate in these site visits.

As part of the review process, all of the involved state and federal agencies meet, on a monthly basis, to review pending applications. Project impacts, alternatives and mitigation opportunities are discussed. These meetings reduce the time involved in correspondence among the agency staffs and, thus, the time involved in obtaining a permit.

Depending on the conclusions reached by the reviewing agencies and the volume and nature of public comments, any of the regulatory agencies may hold a public hearing. No decision on an application can be made until after the public hearing, if one is held. Upon completion of this process, the applicant is formally

advised of all decisions. Assuming a favorable decision is reached, the permit is issued.

All of the regulatory agencies attempt to process applications as quickly as possible. The actual time involved in the process will be determined by the completeness of the application and the complexity of the project. The applicant should anticipate that the process will take two to three (2-3) months. Complex projects may take longer.

All local Wetlands Board decisions are reviewed by the Commissioner of the VMRC to ensure that they are consistent with the Wetlands Act. Decisions may be appealed to the VMRC within ten (10) days under the following circumstances:

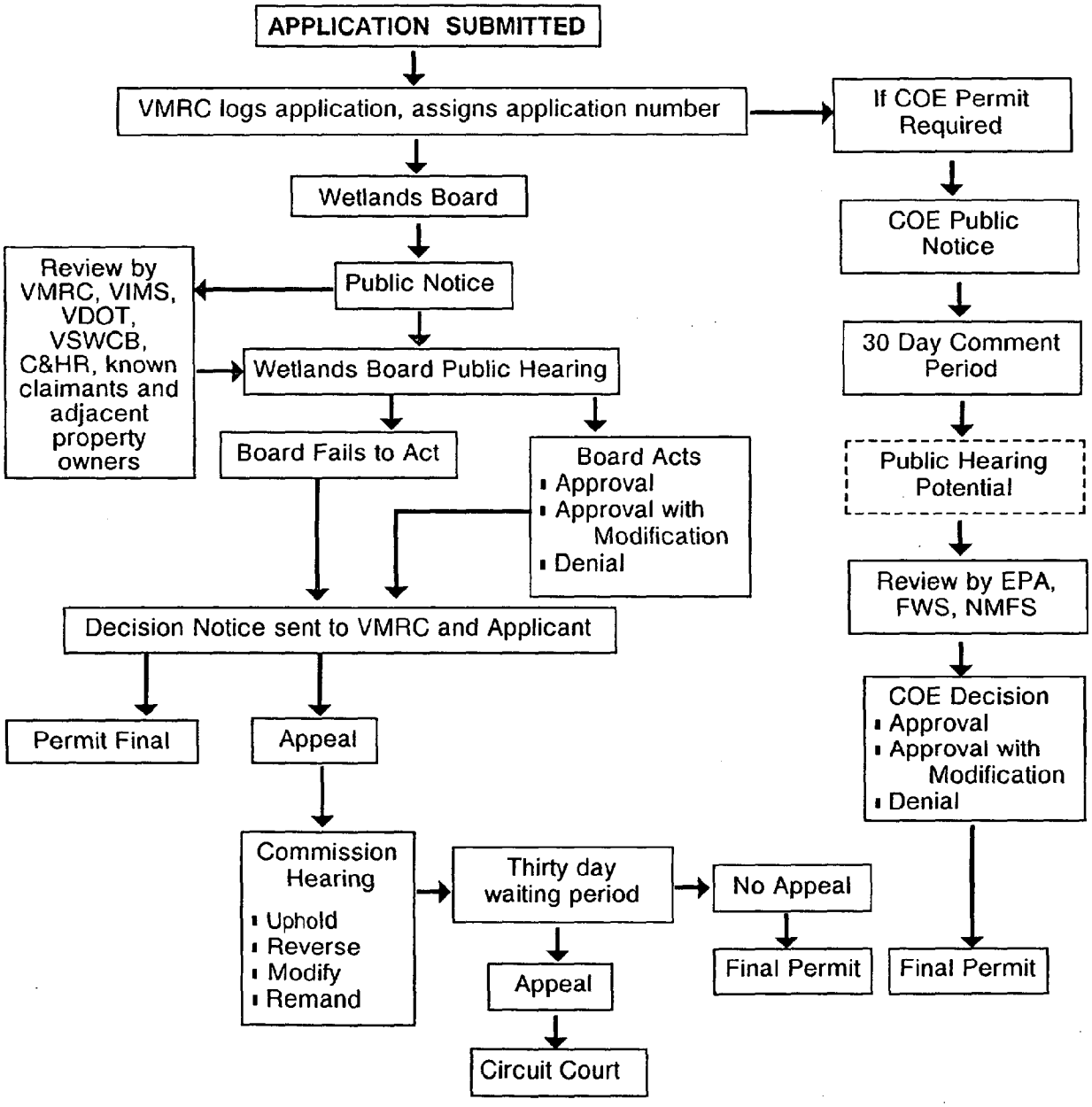
- The VMRC Commissioner finds a local decision to be inconsistent with the Wetlands Act.
- The applicant is dissatisfied with the local Wetlands Board decision. (Appeals are discouraged unless the applicant can show that the decision process was flawed.)
- A petition of protest, signed by twenty-five freeholders residing in the locality is filed with VMRC.

The VMRC Board will review any appeals within forty-five (45) days. Generally, only the applicant and/or the appellant is permitted to testify. Testimony is to deal with the correctness of the decision record transmitted to the VMRC. Either party may appeal the VMRC decision to the Circuit Court.

Both the VMRC and the local Wetlands Board are authorized to enforce the Wetlands Act through administrative orders to comply, stop work orders and injunctions. Violation of the Act is a Class I misdemeanor, punishable by a maximum fine of $1,000. Each day of violation is considered a separate offense. The courts, through an injunction, may direct that the wetland be restored to its natural condition, in addition to imposing a fine. These penalties can be avoided by following the Wetlands Policy and Guidelines in designing and undertaking projects.

Under federal law, the COE is empowered to enforce its regulations governing activities in wetlands. In addition, the EPA has enforcement responsibility for illegal discharges in wetlands. Enforcement actions may be taken administratively by either the COE or EPA. These actions may include orders to stop work on a project as well as remedial measures to restore the wetlands to their original condition. Ultimately, both civil and criminal penalties may be sought. Recent court decisions in federal enforcement actions have been strongly supportive of the federal regulations and have involved fairly stiff penalties.

WETLANDS PERMIT REVIEW PROCESS



Acronyms

VMRC - Virginia Marine Resources Commission
VDOT - Virginia Department of Transportation
C&HR - Virginia Department of Conservation and Historic Resources
VIMS - Virginia Institute of Marine Science
VSWCB - Virginia State Water Control Board
COE - Corps of Engineers
EPA - Environmental Protection Agency
FWS - Fish and Wildlife Service
NMFS - National Marine Fisheries Services

Adapted from: Chesapeake Bay Foundation Conserving Our Wetland Resources: Avenues for Citizen Participation, 1987.

WETLANDS GUIDELINES

Specific criteria, to be used by the local Wetlands Board and the VMRC in making their decisions, are included in the Wetlands Act. All decisions must consider the Act's statement of policy on wetlands use and preservation. In addition, wetlands of primary ecological significance and their associated ecological system must be preserved. Development in Tidewater Virginia, to the maximum extent practical, shall be accommodated as follows:

- In wetlands of lesser ecological significance
- In vegetated wetlands, irreversibly disturbed before July 1, 1972
- In nonvegetated wetlands, irreversibly disturbed prior to January 1, 1983
- In areas of Tidewater Virginia apart from the wetlands.

To guide private citizens and government agencies in carrying out their responsibilities under state legislation, the VMRC, in cooperation with the Virginia Institute of Marine Science, has developed Wetlands Guidelines. Required by the Act, the Wetlands Guidelines describe five categories of wetlands, based on their environmental value.

While individual development proposals require site-specific analyses, if wetlands are to be developed, the lower value wetlands should be developed first. Size is one factor in determining the value of wetlands with larger areas generally being more valuable. However, a number of small wetlands parcels together may have a value which is equal to or greater than that of a single large wetland of comparable size. In addition to consideration of wetland value and size, the Guidelines require that the comparative value and water dependency of the proposed use be determined and compared to the value of the wetland to be destroyed. The Guidelines describe five General Criteria, which apply to all projects, to be used in making these determinations. Specific Criteria for evaluating a number of special projects with significant impact potential are also described.

In addition, VMRC approved Mitigation and Compensation Guidelines for reducing or compensating for losses of wetlands. Under the Guidelines, the policy of the Commonwealth remains to minimize or mitigate the loss of wetlands and associated adverse impacts. Except for minor projects, compensation or wetlands replacement will be required for any project which results in the unavoidable loss of wetlands and which has the highest public and private benefit.

WALTER I. PRIEST, III

REPLANTED WETLAND

CITIZEN RESPONSIBILITY

Citizens play a very important role in protecting wetlands and their functions as well as in reducing the hazards caused by improper development of these lands. There are a number of very important things that citizens can do to ensure the protection of the wetlands and their functions. Most can be characterized as common sense, good-housekeeping measures. Similar measures can be incorporated in larger projects by private developers and governmental agencies. It is incumbent upon citizens to encourage their use. Most of the following suggestions apply equally to any land use activities which are undertaken by individuals. They will result in wetlands protection as well as in general benefit to the quality of the environment.

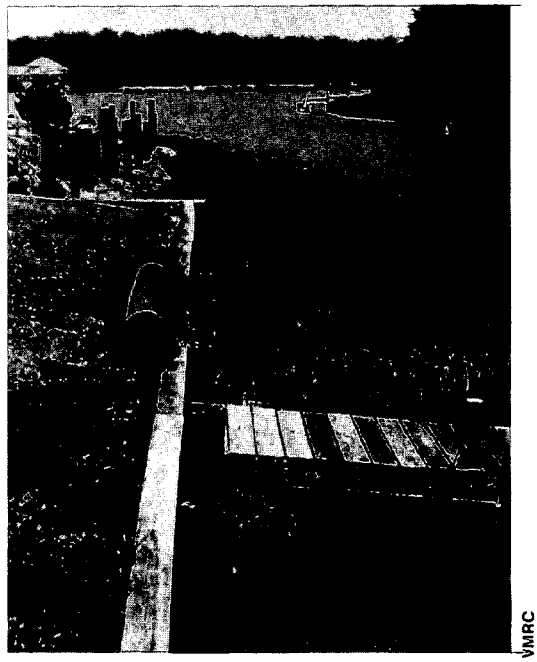
To Protect Wetlands, Do the Following:

- Allow wetlands to perform their natural functions at little or no cost.
- Avoid wetlands as sites for development. Look for alternatives. If non-wetland alternatives are not available, avoid higher quality wetlands.

WALTER I. PRIEST, III

TIDAL MARSH WITH BEACH AND DUNES

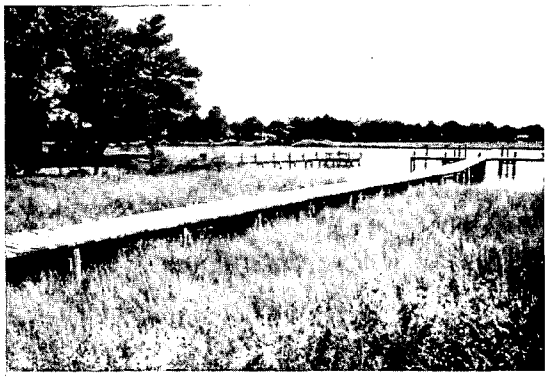
- If development in or adjacent to wetlands is unavoidable, seek uses for that development, which are not disruptive to the wetlands and their functions.
- Become informed about the value of wetlands and various programs which may assist in protecting them.
- Support local, state and federal programs to preserve and acquire wetlands.
- Encourage your local government, area developers and neighbors to conduct their activities in and adjacent to wetlands in a manner which protects them.
- Check the local comprehensive plan and related regulations to ensure that your project is in conformance.
- When building bulkheads, construct them landward of significant wetlands.



VMRC

BULKHEAD BEHIND WETLANDS

- Use sloping riprap, gabions or vegetation rather than vertical seawalls
- Confine dredged material in upland areas, landward of any wetlands
- When building piers, construct them using open pile design to permit free flow of water under the pier.
- Minimize the width of piers to reduce the amount of shading of wetlands vegetation.
- If direct access to a waterway is desired or necessary, construct elevated walkways across sand dunes and wetlands.



EDWIN L. ROSENBERG

OPEN PILE PIER OVER WETLANDS

- Revegetate any upland area disturbed during construction as quickly as possible.
- When shoreline is eroding only slightly or at a fairly slow rate, establish or reestablish wetlands to help control the erosion.
- Because tidal wetlands plants require considerable sunlight to flourish, take measures to ensure that sunlight is available. Remove excess debris that may accumulate on wetlands. Prune tree limbs that overhang and shade wetlands vegetation.
- Preserve existing vegetation on construction sites, especially when in proximity to waterbodies and marshes.
- Minimize disturbance of vegetation in areas adjacent to wetlands when building your residence and accessory structures.
- Protect slopes between uplands and wetlands by planting vegetation and constructing walkways or steps down the bank.
- Install Best Management Practices (BMPs), such as straw bale barriers, silt fences and vegetation buffers during construction even if the construction occurs only in uplands.

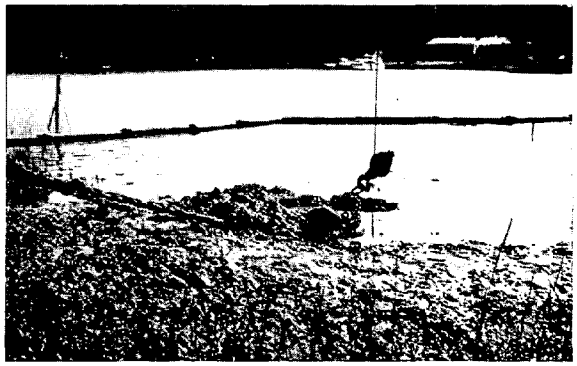
VMRC

SILT FENCE PROTECTING WETLANDS

- Maintain buffer areas around wetlands, especially in areas of intense agricultural or urban activity.
- Design boat access channels at the minimum width and depth to provide necessary access and safety.
- Conduct necessary and permitted dredging during periods of lowest biological activity in wetlands and adjacent waters.
- If possible, use piers and docks to provide access to your boat rather than dredging a channel to the upland shore.
- Locate your residence and related structures on upland areas. Maintain a vegetated upland buffer adjacent to wetlands.
- Maintain natural drainage patterns and flow when developing a site or access to the site.
- Encourage your community to develop programs to manage the quality of stormwater runoff.

SVPDC

PIERS AND DOCKS TO CHANNEL



VIMS

DREDGING WITH CONTAINMENT BOOM

To Protect Wetlands, Do Not Do the Following:

- Do not place dredged or other fill material on wetlands.
- Do not dredge boat access channels through wetlands. Do not dredge channels deeper or wider than the channel to which they connect.

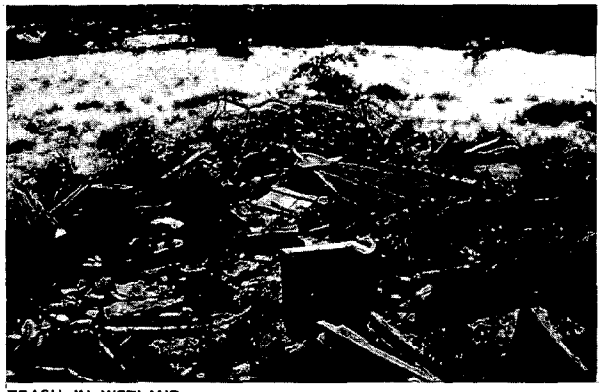
VMRC

FILL MATERIAL ON TIDAL WETLAND

- Do not locate piers too close to the property line so that they interfere with access to adjacent properties.
- Do not produce wakes when close to shore, especially when near wetlands.
- Do not throw trash or debris in water or wetlands whether you are on land or a boat.

SVPDC

NO WAKE AREA ON NAVIGABLE WATERWAY


VIMS

TRASH IN WETLAND

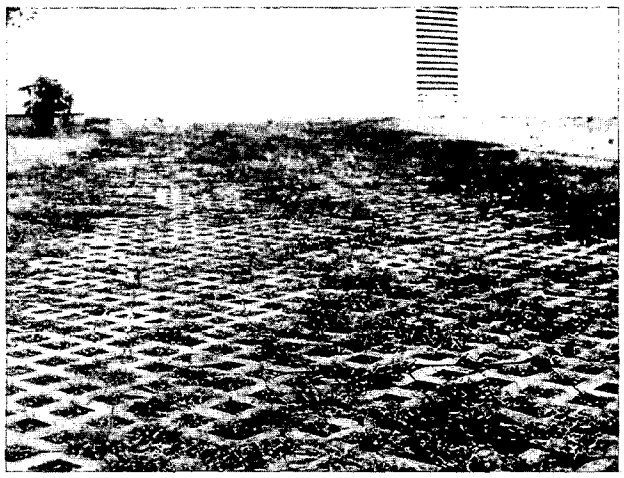
Other Good Housekeeping Measures

- When landscaping your property, use plant materials which are tolerant of, or adapted to, natural conditions on the site. This will minimize your maintenance efforts, as well as conserving water, preventing erosion and reducing the need for fertilizer and pesticides. Use mulch.
- Recycle used motor oil at a nearby service station or community operated recycling center.
- Recycle paper, metals and glass through programs run by your community or a charitable organization. Compost lawn and garden debris.
- Properly dispose of household and garden chemicals and used motor oil. Use community-operated household hazardous waste collection days where available.


SVPDC

HOUSEHOLD HAZARDOUS WASTE COLLECTION

- Do not pour household chemicals or used motor oil on the ground or down the storm drain.
- Do not overfertilize your yard or garden. Also do not overapply pesticides.
- Use vegetated swales rather than pipes or paved channels to provide drainage on your land.
- Use porous materials, such as porous asphalt, concrete pavers or gravel, for low volume traffic areas.
- Avoid the use of septic tanks for waste disposal if other alternatives are available. If no alternatives are available, minimize water use as well as the amount of solids, such as paper and food wastes, introduced into your system.



SVPDC

CONCRETE MODULAR PAVERS

- If a septic tank is the only available alternative, locate the septic tank drainfield in upland portions of your property, as far away from wetlands and surface waters as practical.
- Monitor your septic tank regularly and have it pumped out every 3 - 5 years.
- Adopt soil conservation measures to control erosion and agricultural runoff.
- Do not overwater your lawn or garden.

Arrow Arum

SOURCES OF ASSISTANCE

Additional information on wetlands and on activities which may affect them is available from many state, federal, regional and local government agencies.

Federal Agencies

U.S. Army Corps of Engineers, Norfolk District	(804) 441-7656
U.S. Environmental Protection Agency, Region III	(215) 597-9817
U.S. Fish and Wildlife Service, Virginia Office	(804) 693-6694
National Marine Fisheries Service	(301) 226-5771

State Agencies

Virginia Marine Resources Commission	(804) 247-2200
Virginia Institute of Marine Science	(804) 642-7380
Shoreline Erosion Advisory Service	(804) 642-7121
Council on the Environment	(804) 786-4500
Chesapeake Bay Local Assistance Department	(804) 225-3440
Department of Game and Inland Fisheries	(804) 257-1100
Virginia State Water Control Board	(804) 367-6319

Regional and Local Agencies

All parts of the Commonwealth are included in one of twenty-two Planning Districts. Each Planning District Commission can provide information and advice on the protection and development of wetlands in its area. The Planning District Commissions can also provide assistance on other development issues.

Other special purpose regional agencies, which may be able to assist with development and environmental protection issues, exist in various parts of Virginia. For example, the Peninsula and Southeastern Virginia Planning District Commissions and the Hampton Roads Sanitation District have established the Hampton Roads Water Quality Agency. This Agency was created to undertake regional water quality planning and to assist local and regional agencies on related environmental issues.

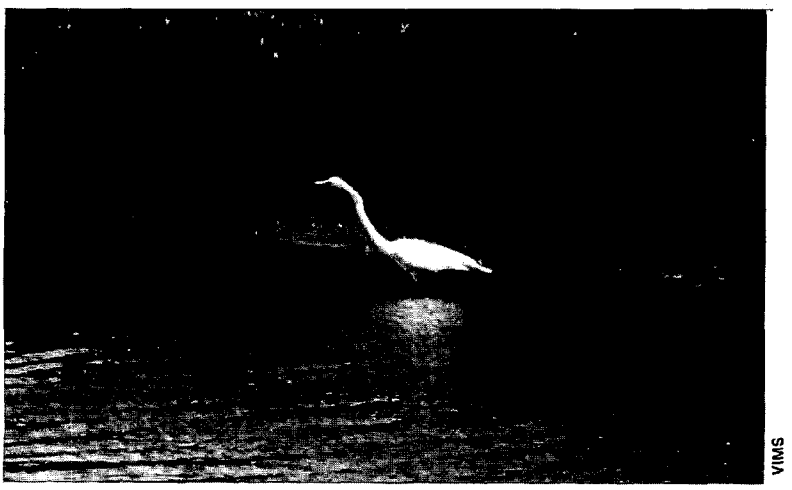
Approximately two-thirds of the eligible localities in the Commonwealth have enacted the model Wetlands Ordinance and have established local Wetlands Boards. Typically, these Boards are staffed by representatives of the Departments of Planning, Public Works, and Environmental Management. Many also receive staff

assistance from the local Soil and Water Conservation District. Staff from any of those local agencies can provide technical assistance and advice on development in or affecting wetlands.

Private Organizations

▪ Alliance for the Chesapeake Bay, Inc.	(301) 377-6270
▪ Back Bay Restoration Foundation	(804) 490-1091
▪ Chesapeake Bay Foundation	(804) 780-1392
▪ Environmental Defense Fund	(804) 780-1297
▪ The Nature Conservancy	(804) 295-6106
▪ Piedmont Environmental Council	(703) 347-2334

Other organizations may also be able to assist an individual on wetlands development and protection issues. However, the listed organizations are known to have professional staff capability on these topics.



FOR LOCAL INFORMATION, CONTACT:

COMMON WETLANDS PLANTS

Common Name	Scientific Name
Saltmarsh Cordgrass	*Spartina alterniflora*
Saltmeadow Hay	*Spartina patens*
Saltgrass Spikegrass	*Distichlis spicata*
Black Needlerush	*Juncus roemerianus*
Saltwort	*Salicornia spp.*
Sea Lavender	*Limonium spp.*
Marsh Elder or High-tide Bush	*Iva frutescens*
Groundsel Bush or Sea Myrtle	*Baccharis halimifolia*
Wax Myrtle	*Myrica sp.*
Sea Oxeye	*Borrichia frutescens*
Arrow Arum	*Peltandra virginica*
Pickerelweed	*Pontederia cordata*
Big Cordgrass	*Spartina cynosuroides*
Rice Cutgrass	*Leersia oryzoides*
Wildrice	*Zizania aquatica*
Bulrush	*Scirpus validus*
Spikerush	*Eleocharis sp.*
Sea Rocket	*Cakile edentula*
Southern Wildrice	*Zizaniopsis miliacea*
Cattails	*Typha spp.*
Three-squares	*Scirpus spp.*
Buttonbush	*Cephalanthus occidentalis*
Bald Cypress	*Taxodium distichum*
Black Gum	*Nyssa sylvatica*
Tupelo	*Nyssa aquatica*
Dock	*Rumex spp.*
Yellow Pond Lily	*Nuphar sp.*
Marsh Fleabane	*Pluchea purpurascens*
Royal Fern	*Osmunda regalis*
Marsh Hibiscus	*Hibiscus moscheutos*
Beggar's Ticks	*Bidens spp.*
Smartweeds	*Polygonum spp.*

Arrowheads	*Sagittaria spp.*
Sweet Flag	*Acorus calamus*
Water Hemp	*Amaranthus cannabinus*
Reed Grass	*Phragmites australis*
Switch Grass	*Panicum virgatum*

NOTE:

The preceding thirty-seven plants are cited specifically in The Virginia Wetlands Act (Section 62.1-13.2(f) of the Code of Virginia) in its definition of vegetated (tidal) wetlands. These plants are illustrated and described in detail in Silberhorn, Tidal Wetland Plants of Virginia, VIMS, 1976.

Alders	*Alnus spp.*
Ashes	*Fraxinus spp.*
Asters	*Aster spp.*
Atlantic White Cedar	*Chamaecyparis thyoides*
Balsam Fir	*Abies balsamifera*
Balsam Poplar	*Populus balsamifera*
Black Willow	*Salix nigra*
Bluegrass	*Poa palustris*
Box Elder	*Acer negundo*
Burreeds	*Sparganium spp.*
Coontail	*Ceratophyllum demersum*
Cotton grasses	*Eriophorum spp.*
Cranberry	*Vaccinium macrocarpon & V. ocycoccos*
Dogwoods	*Cornus spp.*
Eelgrass	*Zostera marina*
Elm	*Ulnus spp.*
Eurasian Milfoil	*Myriophyllum spicatum*
Fetterbush	*Lyonia lucida*
Giant Cutgrass	*Zizaniopsis miliacea*
Hairgrass	*Deschampsia caespitosa*
Inkberry	*Ilex glabra*

Laurel Oak	*Quercus laurifolia*
Loblolly Pine	*Pinus taeda*
Maidencane	*Panicum hemitomum*
Marsh Mallow	*Kosteletzkya virginica*
Muskgrass	*Chara spp.*
Naiads	*Najas spp.*
Overcup Oak	*Quercus lyrata*
Peat Mosses	*Spaghnum spp.*
Pin Oak	*Quercus palustris*
Pond Pine	*Pinus serotina*
Pondweeds	*Potamageton spp.*
Red Bay	*Persea borbonia*
Reed Canary Grass	*Phalaris arundinacea*
Sedges	*Carex spp.*
Silver Maple	*Acer saccharinum*
Slash pine	*Pinus elliottii*
Spatterdock	*Nuphar luteum*
Sweet Bay	*Magnolia virginiana*
Sweet Gum	*Liquidambar styraciflua*
Sweet Pepperbush	*Clethra alnifolia*
Sycamore	*Platanus occidentialis*
Titi	*Cyrilla racemiflora*
Water Hickory	*Carya aquatica*
Water Oak	*Quercus nigra*
Waterweed	*Elodea canadensis*
Wax Myrtle	*Myrica cerifera*
Widgeongrass	*Ruppia maritima*
Wild Celery	*Vallisneria americana*
Willows	*Salix spp.*
Willow Oak	*Quercus phellos*

NOTE:

The preceding listing of common wetlands plants is taken from Rice, Conserving Our Wetland Resources: Avenues for Citizen Participation, 1987. Rice adapted the listing from U.S. Fish and Wildlife Service, Wetlands of the United States: Current Status and Recent Trends, 1984.

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Virginia Marine Resources Commission with VIMS. Coastal Primary Sand Dunes/Reaches Guidelines. Newport News, Virginia: VMRC, 1986.

Virginia State Water Control Board. You and Your Land. Richmond, Virginia: SWCB, 1982.

The Virginia Institute of Marine Science has prepared a series of documents, Shoreline Situation Reports and Tidal Marsh Inventories, describing and mapping wetlands and other shoreline characteristics, for most of the communities of Tidewater Virginia. Prepared over the last ten years, many of these documents are currently being updated. If a report has not been prepared or updated for a particular community, current data and maps are generally available from the Virginia Institute of Marine Science.

"The history of the marsh was over. From birth after the retreating glacier to death, under the laws of progress, the marsh had meant much to many. To scores of animal species, it meant life. To the Indians, it meant food. To the first Deacon, it meant open space, a grassland in the wilderness, and sweet ground on which to found a dynasty. To the last Deacon, it meant money."

Teal and Teal, Life and Death of the Salt Marsh

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