REPORT OF THE
COUNCIL ON THE ENVIRONMENT ON

The Assessment of State and Federal Programs That Affect Virginia's Nontidal Wetlands

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

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Executive Summary

The General Assembly directed the Council on the Environment to assess state and federal programs that affect nontidal wetlands, and to report its findings and recommendations to the Governor and General Assembly. In conducting this study, the Council looked at the policies, laws and regulations of existing programs and their implementation and effects, the functions and values of nontidal wetlands, and the many different types of land-based activities that affect nontidal wetlands.

The protection of nontidal wetlands in Virginia is primarily guided by the federal Clean Water Act, § 404 Wetlands Permiting Program. This program is currently surrounded by uncertainty due to the continual changes in federal policies, regulatory standards and wetlands delineation procedures. This uncertainty has led to permit delays and other impacts on land development, and to the loss of nontidal wetlands. Consequently, **both developmental and environmental interests in Virginia would benefit from a consistent state program that can guide, and provide stability to, the regulation of nontidal wetlands in Virginia.**

Section 401 of the federal Clean Water Act grants states the authority to certify Federal § 404 Wetlands Permits for their consistency with state water quality standards and relevant laws. The Water Control Board has adopted regulations for reviewing and certifying federal nontidal wetlands permits using § 401 authority. By using § 401 authority to conserve the values of nontidal wetlands, the state will build upon, and better coordinate, existing federal and state programs. State program efficiency will be achieved by using the current implementation procedures of the § 404 Joint Permitting Process. As a result of recent developments in the federal Wetlands Program, management authority under § 404 and § 401 now addresses the majority of land-based activities that can adversely affect nontidal wetlands. **A state § 401 program at the Water Control Board provides the best base upon which to build and improve a sound state program for conserving the values of nontidal wetlands.**

Current state authority for a § 401 program at the Water Control Board focuses on water quality. Federal agencies broadly interpret states' authority to protect the functional values of nontidal wetlands under § 401, and a recent Virginia Attorney General's opinion states that these functional values can be fully considered when modifying or placing conditions on § 401 permits. **If Virginia wants to pursue a more comprehensive nontidal wetlands program, additional legislative direction should be given to the state § 401 program to conserve the full range of nontidal wetlands values, including flood storage capacity, aquatic food chain support, erosion control, instream flow maintenance and fish and wildlife habitat.**

Protecting the functional values of nontidal wetlands requires that those values be clearly identified for each nontidal wetland site. Any nontidal wetland program will be more efficient and effective if based on a consistent and predictable system for evaluating site-specific wetland values. The Commonwealth needs a **system for**

classifying, ranking and mapping nontidal wetlands based on the best available information of their functional values. Such a system can reflect the importance of nontidal wetlands to the water quality and flood storage needs of specific watersheds and can incorporate new information on functional values as nontidal wetlands research continues.

Other recommendations within the report would enhance a state nontidal wetlands program. They primarily pertain to the wide range of land-based activities that affect nontidal wetlands. For **agriculture**, the approval, by Soil and Water Conservation Districts, of Soil and Water Quality Conservation Plans for farmers should be contingent upon compliance with Virginia's nontidal wetlands protection program. For **silviculture**, the Department of Forestry should expand its efforts at education, promotion and monitoring of Forestry Best Management Practices for wetlands. For **sand and gravel mining**, permit conditions should employ opportunities for nontidal wetlands reclamation. For **transportation planning**, the secondary impacts of growth and development on nontidal wetlands should be considered in evaluating corridors and alternatives.

Preface

The Council on the Environment conducted a comprehensive assessment of state and federal programs that affect nontidal wetlands in Virginia, as directed by Virginia Code Section 10.1-1201 (amended by Senate Bill 277 of 1990). Virginia Code Section 10.1-1201.1 reads as follows:

§ 1. A. The Council on the Environment shall conduct a comprehensive assessment of existing state and federal programs to identify:
   1. How each program affects nontidal wetlands;
   2. How the programs overlap or interact with on another;
   3. Where opportunities exist for effective coordination among existing programs; and
   4. Where new or enhanced programs are needed.

B. The assessment should identify management efforts in regard to types of nontidal wetlands, including but not limited to:
   1. Isolated hardwood wetlands and small shrub wetlands;
   2. Activities affecting these wetlands, including but not limited to, draining, impounding, and harvesting; and
   3. Functions of these wetlands, including but not limited to, flood and erosion control, water quality maintenance, recreation and habitat.

C. The Council on the Environment shall make its initial report on or before January 1, 1992, and thereafter report annually to the Governor and General Assembly on the results of its assessment.

D. The provisions of this act shall expire on July 1, 1994.

This comprehensive assessment is one in many initiatives that Virginia has undertaken to protect the values of nontidal wetlands and to balance this protection with other objectives, including growth, regulatory efficiency and fairness to affected landowners. That balance is reflected in the language of Virginia Code, Section 10.1-1201.1, including its emphasis on program coordination and its directive to consider both the functions of nontidal wetlands and the activities that may destroy these functions. Program coordination, in particular, is a means to reduce inconsistencies among existing programs and to improve regulatory efficiency while recognizing the balance between public needs and private interests that is essential to the effective management and conservation of nontidal wetlands.

Virginia's involvement in wetlands management began with the *Wetlands Act of 1972*. The Act established a state/local program for protecting tidal wetlands. During the 1980's, development in Virginia's nontidal wetlands increased. The *Federal Wetlands Program* administered by the *Corps of Engineers under § 404 of the 1972 Clean Water Act* covers nontidal wetlands, as well as tidal wetlands, in Virginia. However, the Federal Wetlands Program alone has not been sufficient for managing the development pressure on nontidal wetlands.

The values of nontidal wetlands and their need for protection were recognized in the *Chesapeake Bay Agreement of 1987* and the *Chesapeake Bay Wetlands Policy*, adopted by Virginia and the other Bay signatories. The Wetlands Policy set forth an immediate goal of no net loss, with a long-term goal of net resource gain for both tidal and nontidal wetlands.

Governor Wilder's *Agenda for Virginia* reaffirmed Virginia's commitment to the policy of no net loss of nontidal wetland values in the short term while working towards a long term net resource gain. The Governor's initiative for nontidal wetlands protection, as set forth in the Agenda, is to adopt *Virginia Water Protection Permit Regulations*, implemented by the State Water Control Board, which will promote the no net loss goal.

The first legislative effort to protect nontidal wetlands in Virginia was sponsored during the 1988 General Assembly. *House Bill 1037* would have created a nontidal wetlands regulatory program administered by the former Department of Conservation and Historic Resources. *House Bill 1037* was carried over and then withdrawn in the 1989 Session.

The 1989 General Assembly formed the *Virginia Nontidal Wetlands Roundtable*. The Roundtable published a report in December, 1989 which set forth thirteen recommendations for conserving nontidal wetlands in Virginia. One of the recommendations addressed the need for a comprehensive assessment of how existing governmental programs affect nontidal wetlands in Virginia. The 1990 General Assembly adopted this recommendation through passage of *Senate Bill 277*.

In January of 1991, the Water Control Board reviewed draft regulations for implementing the Virginia Water Protection Permit, authorized under *Virginia Code* § 62.1-44.15:5. The draft regulations contained procedures and standards for permitting water withdrawals from surface waters and dredge and fill activities in nontidal wetlands. The Water Protection Permit regulations would have supported a state program implemented through the Federal authority granted to states in § 401 of the Clean Water Act. Section 401 authorizes states to certify federal permits for their consistency with state water quality standards.

The Water Control Board tabled these regulations due to the number of comments received and the legal questions that they raised. Subsequently, the Virginia Attorney General rendered an opinion stating that the Water Control Board has the authority under § 401 of the Clean Water Act to review federal § 404 permits for their consistency with Virginia's water quality standards and to condition such permits for the protection of other values of nontidal wetlands.

In December of 1991, the Water Control Board proposed modified regulations for the implementation of the Virginia Water Protection Permit through the federal authority provided in § 401 of the Clean Water Act. These regulations define nontidal wetlands as components of the surface waters of Virginia and set forth procedural guidelines and certain management criteria for the review of federal § 404

permits which relate to water withdrawals and/or dredge and fill activities conducted in surface waters, including nontidal wetlands. These regulations became effective in May of 1992.

In assessing programs that affect Virginia's nontidal wetlands, staff of the Council on the Environment reviewed state and federal policies, legislation and regulations, and interviewed local, state, federal and private officials involved in managing land use and natural resources. This report summarizes the significant findings and recommendations that were developed through that assessment. The recommendations set forth reflect the judgment of Council staff. Each of the issues and recommendations have been discussed with representatives of appropriate state agencies, but they do not necessarily represent the views of any other agency.

The economic impacts of recommendations found in this report have not been quantified. Economic factors were an important consideration throughout the assessment and are reflected in the recommendations provided. This report focuses on coordinating existing programs, but the implementation of certain recommendations may require additional staff resources. Where enhanced staff levels are necessary to fully implement program recommendations, further assessment will be needed to determine these staff requirements.

In recent years, Virginia's state agencies have responded to the heightened interest in protecting the values of nontidal wetlands. Many of these agencies are developing or implementing strategies to improve the conservation of nontidal wetlands through their respective programs and activities.

Ongoing efforts to improve the protection of nontidal wetlands in Virginia will continue. The recommendations set forth in this report are designed to facilitate these efforts, coordinate programs where appropriate, and reduce some of the barriers that agencies face in conserving nontidal wetlands. The recommendations are also designed to foster the technical expertise necessary to focus management actions on the values of nontidal wetlands and to provide consistency among agency actions. It is important to note that the efforts of these agencies to protect nontidal wetlands will continue and do not depend on the implementation, within any specific time frame, of every recommendation made in this report.

The Virginia Water Control Board's regulations for implementing a § 401 program will provide regulatory oversight for activities in nontidal wetlands that require a federal § 404 permit from the Army Corps of Engineers. This initiative will give Virginia the opportunity to improve the current regulation of nontidal wetlands under the Federal § 404 Wetlands Program. An opportunity available to Virginia is to enhance this effort through state legislative authorization. This authorization would improve the Water Control Board's ability to develop a nontidal wetlands program that identifies and conserves the functional values exhibited by each type of nontidal wetland. This would be accomplished through the development of a classification system, and an assessment and ranking process, that can focus on the values of individual wetlands, and can guide and coordinate management activities.

Improving our understanding of the functional values exhibited by individual nontidal wetlands and institutionalizing that knowledge into a classification and ranking system is an important step in coordinating agency actions that affect nontidal wetlands. The foundation of a classification system has been developed nationally and is currently used by the National Wetlands Inventory of the U.S. Fish and Wildlife Service. Important elements of an assessment and ranking system have been developed nationally and are under refinement or consideration at the Virginia Institute of Marine Science and the Water Control Board. This effort will benefit from ongoing scientific research and the existing expertise housed within state agencies and academic institutions.

The principal recommendation of this report is that Virginia refine and develop technical expertise and management capabilities for nontidal wetlands. This refinement and development does not necessarilly mean stricter, or more, regulation than the current regulation of nontidal wetlands under the § 404 Federal Wetlands Program. Rather, the purpose is to develop the baseline understanding and process that will focus regulatory actions on conserving the functional values of nontidal wetlands.

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I. Introduction

There is a growing understanding of the benefits of nontidal wetlands. They include water quality maintenance, flood storage, aquatic food chain support, shoreline erosion protection, ground-water discharge and recharge, and the provision of wildlife habitat and recreational opportunities. Not all nontidal wetlands perform these functions to the same degree. The most prevalent types of nontidal wetlands found in Virginia provide high levels of water quality maintenance (sediment trapping) and flood storage. The Virginia Institute of Marine Science of the College of William and Mary is currently developing and refining methods for identifying the extent to which different nontidal wetlands in Virginia perform valuable functions.

Historically, agricultural clearing and draining has been the leading cause of nontidal wetland conversion in Virginia. Federal and state wetlands managers currently believe that land development and other activities associated with population growth have surpassed agricultural conversion as the leading cause of nontidal wetland loss. These activities include road construction, residential development, pond and lake construction, sand and gravel mining, water supply impoundment and others.

There is general agreement among scientists and managers on the definition of nontidal wetlands. For the purposes of the § 404 Federal Wetlands Program, wetlands are "...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." *Nontidal wetlands* are wetlands which are not affected by tidal inundation or fluctuation.

However, there is controversy over how the definition is applied through regulation (on-site delineation). Though research has shown that nontidal wetlands perform environmental functions and that their loss can adversely affect downstream lands and waters, it is difficult to pinpoint the precise location in the landscape where these functions and impacts become significant enough to warrant regulation.

The first effort to achieve a consistent approach to delineating wetlands, the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands, became a focal point for concern with the Federal Wetlands Program; and its use by the Army Corps of Engineers has been disallowed by Congress. The 1989 Manual required permits in areas not previously regulated, increasing the permit load for the Corps of Engineers. While a high percentage of permits continued to be approved under the Federal Wetlands Program after the adoption of the 1989 Manual, permit applicants were suddenly subject to extended permit reviews and increased costs associated with this delay. For many development projects, these increased holding costs and the difficulties created for investment and site planning have surpassed the costs of on-site wetlands protection.

A draft revision to the 1989 Federal Manual was published in 1991. This Manual would create a new set of problems for the delineation and management of nontidal wetlands. The time for conducting nontidal wetland delineations under the draft Manual would increase significantly. In addition, the draft Manual would remove from jurisdiction entire wetlands systems that have been shown to be of value in flood control and water quality protection. As lead agency for nontidal wetlands, the Water Control Board maintains that the best line for delineating nontidal wetlands lies between the lines of the 1989 and 1991 Manuals. If a subsequent revision to Federal Manual is published, it will likely reflect that balance.

The debate over the Federal Manual will not significantly affect the conclusions reached through this assessment and the opportunities identified for program coordination and enhancement. There is a need to improve the current management of nontidal wetlands, regardless of the final version of the Manual.

The major point relevant to the Federal Manual is that in order to streamline current regulation, and to achieve consistency between state and Federal regulatory programs, Virginia will need to maintain consistency on the basic method for identifying and delineating nontidal wetlands.

The management, loss and protection of nontidal wetlands in Virginia is determined by the sum effects of wetlands regulatory programs, land-use programs, resource extraction and harvesting programs, waste management programs, transportation programs, water quality programs, floodplain programs and others. These programs have varying effects on Virginia's nontidal wetlands. Even taken together, they do not adequately protect the valuable functions performed by nontidal wetlands. However, these programs do provide a sufficient base for coordinating and enhancing nontidal wetlands conservation and management.

The program which has the greatest effect on nontidal wetlands is the Federal Wetlands Program, administered by the Army Corps of Engineers and other Federal agencies. This program operates under the authority of Section 404 of the Clean Water Act and additional legislation and policies which affect Federal permitting actions. The § 404 program includes a complete statutory and regulatory system and relevant judicial decisions. The program also includes a permitting infrastructure, procedures and staff for regulating activities in wetlands.

Implementation of the Federal Wetlands Program in Virginia by the Norfolk Corps District has protected many acres of nontidal wetlands. However, this program is not designed to meet the goal of no net loss of nontidal wetlands values set forth by Governor Wilder. The inability of this program to fully protect nontidal wetlands is due to the limited regulatory scope that the Corps of Engineers interprets and applies under the program, the current staff levels of the agency and the guidelines for approving or denying permits. Provisions in the law and regulations of the Federal Wetlands Program allow for nontidal wetlands loss at nearly every stage in the process of subdivision and development.

Nontidal wetlands regulation by the Norfolk District has been hindered by changing Federal wetlands policies and the lack of any state nontidal wetlands standards. This condition has had a significant impact on the regulated development community, which is unable to plan, invest, and design projects based on consistent requirements and standards. The public image of the program has also suffered due to inconsistent regulatory standards.

Shifts in federal wetlands policies, which have occurred throughout the history of the § 404 program, have been caused by inter-agency disputes, judicial decisions, administrative policy changes and other factors. These policy shifts are likely to continue and to adversely affect the protection of nontidal wetlands in Virginia. The § 404 program also regulates activities in Virginia's tidal wetlands; however, the regulation of tidal wetlands is not affected by Federal policy shifts due to the consistency provided by the Policies, Standards and Guidelines of the Virginia Tidal Wetlands Program, administered by the Marine Resources Commission under the provisions of the 1972 Virginia Wetlands Act.

Providing stability to federal nontidal wetlands regulation in Virginia is one of the principal opportunities to improve current efforts. The Federal Program provides a base for state involvement, and improved protection of nontidal wetlands, as a result of the program's recently expanded potential to regulate activities such as excavation and drainage. If Virginia chooses to pursue a more comprehensive nontidal wetlands program, and provide greater stability to federal nontidal wetlands regulation, it will require enhanced state authority and the resources to implement such a program.

The state level is the appropriate level for improving the conservation of nontidal wetlands. This is based on the Commonwealth's interests in flood control, water quality protection, economic growth, private property rights and land use.

Virginia's Water Protection Permit Program, administered by the Water Control Board under § 401 of the Clean Water Act, reviews federal § 404 nontidal wetland permits to determine their consistency with state water quality standards. Until recently, the scope of federal § 401 authority was not sufficient for controlling the range of activities that affect nontidal wetlands. The purview of § 401 is limited by the purview of § 404; and until recent changes, the § 404 program could not address many of the activities, including clearing, draining and excavating, that have a significant effect on the loss of nontidal wetlands. However, a regulatory guidance letter promulgated by the Corps of Engineers in 1990, which interprets a 1984 court decision, brings most land clearing and excavation activities under regulation.

A number of state programs include responsibilities and expertise in the functions that nontidal wetlands perform, including flood storage, nonpoint source pollution reduction and wildlife habitat. Current provisions within the Virginia Water Protection Permit Law require that permit review under this program include review by the state agencies which house this expertise. As Virginia pursues the

development of a § 401 nontidal wetlands program under the Water Protection Permit, valuable expertise in the functions of nontidal wetlands will be made available to regulatory decisions affecting nontidal wetlands.

Numerous other state programs oversee activities, such as forestry, mining, agriculture, waste management, road construction and others, which affect nontidal wetlands. Opportunities exist for enhancing these programs in order to decrease conflicts among wetlands regulation, public investment and private planning and to track the effects of these activities on nontidal wetlands. However, regulatory frameworks for balancing nontidal wetlands protection with different land-use activities do not need to be duplicated within state programs that oversee these activities. For most types of activities, this process is most efficiently handled within a single regulatory program that houses technical wetlands expertise.

Nontidal wetlands regulation typically affects the way regulated parcels of land are developed and places the burden of regulatory compliance on affected landowners. Local tax structures and zoning ordinances traditionally are not designed to offset some of the effects of regulatory actions on affected landowners. There is an opportunity to use local tax and land use provisions to achieve effective wetlands protection and reasonable economic development returns. Local tax rates on regulated nontidal wetlands can be designed to reflect the public values and use potential of these areas. Ordinances which allow density credits and/or clustering on the upland portions of regulated parcels can also moderate the effects of nontidal wetlands regulation on affected landowners.

In the regulation of nontidal wetlands, there is currently no licensing or certification process for ensuring that individuals performing nontidal wetlands delineations are trained to meet the necessary standards for wetlands regulation. Such a certification process, and the consistent delineation that it would provide, may improve the regulation of nontidal wetlands. Currently, the Council on the Environment, in cooperation with the Department of Commerce, the Virginia Institute of Marine Science and other public and private organizations, is studying the needs and possible benefits associated with a program for ensuring the professional competency of nontidal wetland delineators.

The following sections of this assessment provide a discussion of the major types of nontidal wetlands found in Virginia and the functions they perform, a discussion of the ways that different activities affect nontidal wetlands, an assessment of the effects of state and Federal programs on nontidal wetlands, and recommendations for coordinating or enhancing current efforts.

This assessment is the first of three annual reports that will be provided to the Governor and General Assembly under the directive of *Virginia Code* Section 10.1-1201. This first report focuses on establishing nontidal wetlands regulatory authority in the Water Control Board and other elements of program coordination or enhancement that will improve the protection of nontidal wetlands. The two following reports will address progress in these areas and recommend any further changes.

II. Types and Functions of Virginia's Nontidal Wetlands

A variety of nontidal wetland types are found across the different regions of Virginia. Variations in wetlands types are due to factors such as underlying geology, soil type, climate, and water movement. National Wetlands Inventory maps of Virginia use a classification code to differentiate wetlands, based on type of waterbody, amount and type of vegetation, substrate, hydroperiod, and other characteristics.

The water sources for nontidal wetlands include surface waters and groundwater. Wetlands found along the upper edges of rivers are generally seasonally flooded, as water tables rise in the spring. Floodplain wetlands, such as bottomland hardwoods, are usually temporarily flooded.

Many of Virginia's nontidal wetlands are shallow areas that are mostly vegetated. Nontidal wetlands in the mountainous areas of the state include excavated basins, with sparse vegetation. Groundwater seeps are also found in this region. The nontidal wetlands of the Piedmont region are mostly riverine floodplains. Clay deposits and flat topography in the coastal plain have contributed to the formation of substantial areas of nontidal wetlands, which extend high up into the watersheds of rivers and streams.

Current scientific research indicates that the most prominent types of nontidal wetlands in Virginia are associated with high levels of water quality enhancement and are important contributors to aquatic food chains. However, Virginia's nontidal wetlands may perform a number of important environmental functions.

Ground-water Discharge and Recharge

Both functions result from the retention of water in a nontidal wetland. Recharge refers to the channelling of surface flow into aquifers, replenishing water supplies. Discharge conveys groundwater to the surface, augmenting base streamflow.

Wildlife Habitat

Wetlands support over 50% of rare, threatened or endangered plant species in Virginia. Endangered fauna such as the rare American Bittern depend upon nontidal wetland habitat. Nontidal wetlands such as bottomland hardwoods support a high density of amphibian, waterfowl, and mammalian species. Game species use nontidal wetlands, for example, because of a high density of invertebrate food sources and cover.

Flood Storage and Peak Reduction

Nontidal wetlands slow discharges and reduce flood peaks by intercepting and temporarily storing storm runoff. Numerous wetlands within a watershed may store peak flows, releasing the waters gradually. Both functions serve to contain flows within downstream channels. Reduction of flow peaks may reduce flood damage and reduce the need for flood control measures.

Shoreline Anchoring and Dissipation of Wave Energy

Riparian nontidal wetlands help stabilize shoreline soil and buffer the shore from erosive forces with their roots and vegetation. Abatement of erosion conserves fertile soil, prevents sediment deposition in navigable channels and impoundments, and preserves shoreline property.

Water Quality Maintenance

Nontidal wetlands serve as natural filters by retaining suspended sediments and associated nutrients, pesticides, heavy metals, and other toxins. Removal processes involve sedimentation of inorganic matter, adsorption onto soil particles, metabolism of organics, and microbial conversion of gases. Nutrients are taken up by the vegetative and microbial components of nontidal wetlands, which may later be released in different form. Such processes preserve water quality by reducing turbidity, and by removing toxic compounds and inorganic nutrients.

Food Chain Support

Wetlands are effective at aquatic food chain support, due to a high degree of primary productivity and dispersal of nutrients in forms that are usable to higher trophic levels. Seasonally flooded and riparian wetlands have been reported to contribute substantially to food chains. Organic carbon and nitrogen compounds, bound in exported leaf matter, may benefit animals inhabiting downstream aquatic environments, including commercially valuable shellfish and sportfish.

Recreation and Open Space Value

Nontidal wetlands possess numerous recreation values: game species such as inland waterfowl and sportfish depend upon nontidal wetlands; wetlands provide native ecological systems important to education; and wetlands are important in maintaining water quality in areas of water-based recreation. In addition, nontidal wetlands provide scenic, open space, natural, and scientific values.

The potential functions of the most prominent nontidal wetland types vary among regions. Nontidal wetlands such as bogs, ponds and meadows in the western portion of Virginia, as well as headwater wetlands throughout the state, buffer and detain flood waters for the protection of downstream areas. These areas may also serve as sites for groundwater recharge.

Nontidal wetlands located along rivers and streams in the Piedmont and Mountain regions perform nutrient retention, sediment filtering and other water quality functions similar to those provided by tidal fringe marshes of the Coastal Plain. These wetlands also serve as conduits for groundwater discharge, helping to maintain the flow levels of streams and rivers.

Bottomland hardwood swamps of the Coastal Plain are important sources of food production for aquatic animals. These nontidal wetlands provide habitat for numerous species and are important for water quality protection, erosion control, hunting and other recreational activities.

Due to their physical characteristics and their locations in watersheds, nontidal wetlands provide substantial benefits to downstream lands and waters. The most valuable functions performed by nontidal wetlands are their capacity to enhance water quality, their ability to reduce flooding, and the food and habitat they provide for fish, waterfowl and rare, threatened or endangered species.

Understanding the types of nontidal wetlands present in a region and the functions they perform is important in balancing wetlands protection with other uses and in targeting management efforts. Therefore continued research in the area of wetlands research is important and should be adequately funded.

III. Activities that Affect Virginia's Nontidal Wetlands

For most of Virginia's history, nontidal wetlands have been considered wastelands, of little value to our society and economy. This perception has led to the destruction of wetlands through agricultural drainage; channelization for flood control; dredging and/or filling for housing, marinas, highways, industry and landfills; reservoir construction; timber harvest; groundwater extraction; and water pollution and waste disposal. These activities vary in the degree to which they destroy the functions of a wetland, and the degree to which the impacts are reversible.

Filling wetlands is typically the most destructive and irreversible type of impact. Wetlands fill eliminates the basic character of the wetland and is typically followed by some form of permanent development or construction activity.

Wetlands dredging and excavation are also destructive of wetlands systems. However, the open water habitat that is created may replace some of the lost wetland values. Dredged or excavated wetlands that are converted to open water may revert, or be reclaimed, back to a wetland.

The impoundment of wetlands may also replace certain lost values through the creation of open water habitat and the creation of peripheral wetlands along the waterline. Wetlands lost to impoundment are rarely reclaimed.

Draining and other forms of hydrologic modifications have variable effects on wetlands. These activities typically destroy the wetland over a number of years, but are reversible where subsequent development has not taken place.

Clearing wetlands for silviculture has definite short term impacts on wetlands systems. However, the long term effects of these activities are not necessarily significant where proper forestry BMPs are employed.

The U.S. Fish and Wildlife Service estimates that Virginia lost 57,000 acres, or fourteen percent, of its approximately 800,000 acres of nontidal vegetated wetlands between 1956 and 1977. Agricultural drainage, mostly in the Coastal Plain, was the largest contributor to the conversion of nontidal wetlands over this period.

Changing economic factors over the past fifteen years and the establishment of conservation programs over the past seven years have decreased the rate of agricultural conversion. During this period, land development and other activities associated with population growth have become a significant cause of nontidal wetlands loss in Virginia. Other activities associated with population growth include road construction, mining for sand and gravel, pond or lake construction, water supply impoundment, and the degradation of water quality from urban runoff.

Accurate quantitative information is not currently available on the specific effects of different activities on the rate of nontidal wetlands loss in Virginia.

IV. Findings and Recommendations

A. State Management of Nontidal Wetlands

Nontidal wetlands across Virginia, particularly in the Piedmont and Coastal Plain regions, are worth protecting. Efficiency and economic returns for Virginia's development community and landowners are also worth protecting.

While numerous state and federal programs affect the management of nontidal wetlands, these programs do not fully protect the acreage and functions of even the most valuable nontidal wetlands from the impacts of land development.

Changing policies, ambiguous regulatory standards and permit delays of the § 404 Federal Wetlands Program, administered by the Army Corps of Engineers, have led to adverse economic effects on the process of land development. The addition of state policy, and specific and consistent regulatory standards for nontidal wetlands, would result in better protection of nontidal wetlands and greater predictability for the regulated development community. Through coordination with the existing regulatory program of the Norfolk Corps District office, nontidal wetlands management in Virginia can be improved with limited state resources.

> Recommendation: **Virginia should pursue a nontidal wetlands program that improves the protection of nontidal wetlands, provides the necessary leadership for consistent regulation, establishes specific guidelines for federal and state programs and builds upon the existing program structure in state and federal agencies.**

There are three basic courses of action available to Virginia for improving the protection of nontidal wetlands and increasing the predictability and consistency of current regulation. The first of these is for the Water Control Board to continue on its present path of adopting regulations for the operation of a § 401 nontidal wetlands program. The second is to augment the Water Control Board's regulatory effort with further legislative direction for the development of a § 401 nontidal wetlands program. The third is to authorize, fund and develop a separate, new nontidal wetlands regulatory program and to assume implementation of the § 404 Federal Wetlands Program.

Currently, there is no need nor rationale for developing a separate, new program. The development of a § 401 program at the Water Control Board provides Virginia with the opportunity to improve the management of nontidal wetlands with fewer additional resources and without the creation of a separate regulatory permitting program. A § 401 program may be administered through the existing Joint Permitting Process of the Army Corps of Engineers, the Virginia Marine Resources Commission and the Water Control Board.

Linking federal and state authority through § 401 would allow Virginia to improve current protection of nontidal wetlands while maintaining federal/state consistency in program implementation. This goal may be achieved through the ongoing efforts of the Water Control Board. If Virginia chooses to pursue a more aggressive nontidal wetlands program, these efforts would be aided by additional legislative authority directing the Water Control Board to develop a § 401 program for managing nontidal wetlands based on their functional values.

Section 401 authority of the Clean Water Act allows state certification of § 404 permits based on the protection of water quality. Federal agencies broadly interpret the language in § 401 to include other functional values of nontidal wetlands. The functional values of nontidal wetlands that could be conserved under a § 401 program include: their ability to capture sediment, nutrients and other pollutants; their capacity to store and buffer flood waters; their ability to slowly release stored water to replenish groundwater and maintain instream flows; and their ability to serve as valuable nursery and habitat for fish and wildlife. To protect each of these functional values through § 401, the Water Control Board must have sufficient direction and authority to guide program development and to support regulatory decisions for the protection of these values.

Recommendation: **The State Water Control Board should examine its authority, particularly the Water Protection Permit Section of the State Water Control Law, to support a program for conserving nontidal wetlands, based on their functional values, using state authority and the authority of § 401 of the Clean Water Act.**

The definition of Beneficial Uses of the Waters of the Commonwealth in the Water Protection Permit Section already includes many of the values of nontidal wetlands which may be considered in the implementation of a § 401 program. With the addition of flood storage capacity to this definition, this program would be capable of conserving the most important values of Virginia's nontidal wetlands.

Recommendation: **As the State Water Control Board evaluates its current authority, it should pay particular attention to the need for expanding the definition of Beneficial Uses of the Waters of the Commonwealth under the Water Protection Permit Section to include all values of nontidal wetlands, such as flood storage capacity.**

Specific standards for managing impacts on nontidal wetlands assist the regulated development community in investment and site planning and facilitate monitoring and enforcement. Such standards can include design standards for Best Management Practices and wetlands creation/mitigation projects.

Under a directive set forth by the U.S. Environmental Protection Agency, states are expected to define nontidal wetlands in their definition of surface waters

and develop water quality standards for conserving wetlands under § 401 programs by the end of Federal Fiscal Year 1993. Consistent with an opinion by the Virginia Attorney General, the § 401 regulations proposed by the Water Control Board define nontidal wetlands as components of the surface waters of Virginia.

> Recommendation: **The foundation of a § 401 program for nontidal wetlands should be water quality standards for regulating proposed uses in these wetlands and design standards for Best Management Practices and wetlands creation/mitigation projects.**

An efficient and effective method of protecting nontidal wetlands that are valuable for wildlife habitat and flood control is to classify, rank and map nontidal wetlands based on the degree to which they perform these functions. This strategy provides predictability to the regulated development community and increased protection of nontidal wetlands values.

> Recommendation: **The Water Control Board, in conjunction with the Virginia Institute of Marine Science, the Department of Conservation and Recreation, the Department of Game and Inland Fisheries, and other appropriate agencies should develop a classification and ranking system that is based on all important values of nontidal wetlands. Efforts should be made to map the location of these nontidal wetlands in Virginia. The agencies should also identify the resources necessary to pursue this program.**

While debate continues over the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, Virginia should not delay development of a § 401 nontidal wetlands program. A § 401 program offers the Commonwealth a means to provide effective input into refining the Manual and to ensure that it is suited to managing Virginia's nontidal wetlands. Enhanced § 401 program expertise will allow Virginia to better determine whether jurisdictional boundaries under the Manual are appropriate and whether the delineation procedures are practical and efficient.

As Virginia develops regulatory oversight of nontidal wetlands, it will be valuable to continue to assess where nontidal wetlands are being lost and the types of activities responsible for these losses.

> Recommendation: **The implementation of a § 401 program should include a monitoring system to assess the capability of the program to meet the goal of no net loss of nontidal wetlands values.**

The Water Control Board has recently added two full time employees within the Office of Water Resources Management to bring to six the number of full time staff dedicated to the regulation of nontidal wetlands. Developing and implementing

a program that can improve the efficiency of current regulation and conserve the functional values of nontidal wetlands will require additional staff resources in the Office of Water Resources Management.

Recommendation: **As funds become available, staff levels dedicated to nontidal wetlands regulation at the Water Control Board should be enhanced.**

Establishing an effective public/private partnership in protecting and managing nontidal wetlands will require consistent wetlands delineation expertise among regulators and the regulated development community. Currently, a study is underway by the Council on the Environment to consider the options for training and recognizing competency of wetlands delineators.

Recommendation: **The State Water Control Board and other agencies and institutions involved in managing wetlands should give consideration to the results of the study being conducted by the Council on the Environment in order to ensure consistent expertise in wetlands identification and delineation among regulators and the regulated development community.**

B. Related Programs and State Opportunities

Chesapeake Bay Preservation Area Program

Virginia's Chesapeake Bay Preservation Act is a water quality program, not a wetlands regulatory program. However, the water quality maintenance functions of wetlands are recognized in the regulations of the Preservation Act; and certain classes of nontidal wetlands are designated as Resource Protection Areas in local Preservation Area programs.

Water quality protection is the cornerstone of federal and state wetlands management programs. As the Water Control Board develops water quality standards for conserving the values of nontidal wetlands, it will be important that these standards do not conflict with the standards and practices of local Preservation Area programs. Under current staff levels, the Water Control Board will need to focus nontidal wetlands regulation on those areas which are under the greatest threat and which are not effectively protected under other programs.

Recommendation: **As Virginia proceeds in developing specific water quality standards for wetlands, the Chesapeake Bay Local Assistance Department and the Water Control Board should pursue consistency between the standards and management practices of the two programs.**

Agricultural Programs

The historically high rate of agricultural conversion of nontidal wetlands in Virginia has been greatly reduced. However, agricultural conversion would remain a potential threat to nontidal wetlands under an improved agricultural economy.

Each of the State and Federal agricultural conservation programs which significantly affect nontidal wetlands have been recently amended or enacted. These include the 1990 amendments to the 1985 "Swampbuster" program; the 1990 Wetlands Reserve Program; the agricultural provisions of the 1988 Chesapeake Bay Preservation Act; the 1990 Regulatory Guidance Letter of the Army Corps of Engineers which brings new agricultural drainage and clearing activities under § 404 regulatory purview; and recently modified technical assistance practices of the U.S Soil Conservation Service.

The legislative foundations of these programs are sufficient to support the adequate conservation of nontidal wetlands. However, there are opportunities to coordinate the implementation of these programs with Virginia's policies, and developing programs, for managing and protecting nontidal wetlands.

Normal farming activities, including tilling, harvesting and planting in prior converted croplands (drained or altered before 12/23/85), are exempt from Federal wetlands regulation under § 404 of the Clean Water Act. The exemption for normal farming activities will be maintained through the implementation of a § 401 nontidal wetlands regulatory program.

As a result of judicial decisions and subsequent regulatory guidance, § 404 and § 401 programs are authorized to regulate further agricultural clearing and drainage of nontidal wetlands. There currently exists no mechanism or permit review process for these programs to oversee agricultural conversion activities.

Water Quality Specialists in Soil and Water Conservation Districts are charged with assisting agricultural compliance with the Chesapeake Bay Preservation Act and in developing Soil and Water Quality Conservation Plans for farmers affected by local Chesapeake Bay Preservation Act programs. These Plans are patterned after U.S. Soil Conservation Service Technical Field Manuals. In the development of Soil and Water Quality Conservation Plans, Water Quality Specialists conduct site visits and review the harvesting practices and conservation practices of farmers and use this information to develop individual plans. The water quality functions of nontidal wetlands are important elements of these plans.

Recommendation: **Water Quality Specialists in Soil and Water Conservation Districts should emphasize wetlands protection in choosing among alternative agricultural Best Management Practices for development of Soil and Water Quality Conservation Plans.**

Recommendation: **Development and approval of Soil and Water Quality Conservation Plans by Water Quality Specialists should be contingent upon compliance with § 404 and § 401 programs and the prohibitions against drainage and clearing of nontidal wetlands. Where Water Quality Specialists observe agricultural drainage of nontidal wetlands, landowners should be informed that final Plan approval depends upon compliance with requirements of the § 404 and § 401 programs.**

Recommendation: **As funds become available, additional Water Quality Specialists should be added to appropriate Soil and Water Conservation Districts in order to increase their ability to work with individual farmers and to ensure consistency in the application of Virginia's programs for conserving water quality and nontidal wetlands.**

The Swampbuster Program of the 1985 Farm Bill was shown to be ineffective at halting agricultural conversion of wetlands. The 1990 Amendments to the Program improved its potential for reducing agricultural conversion of nontidal wetlands by allowing graduated penalties for violations and changing the Swampbuster trigger to the actual draining of wetlands. However, the uncertainty regarding the Federal Wetlands Identification Manual hinders wetlands protection efforts under the Swampbuster program due to the difficulty in establishing a baseline for management.

Recommendation: **Virginia should continue to work toward an effective resolution of the wetlands delineation issue in order to facilitate nontidal wetlands protection under the Federal Swampbuster program.**

The newly established Wetlands Reserve Program of the Federal Government offers an opportunity to reimburse Virginia's farmers for their efforts to protect nontidal wetlands. Under the program, farmers are paid for setting aside easements on wetlands. The Wetlands Reserve Program will operate on a state-by-state bidding process. Farmers place a bid on the easement areas and this price is considered along with the bidding levels of other states. Though Virginia is a priority state as a member of the Chesapeake Bay Agreement, the bidding levels of the Wetlands Reserve Program may not provide an adequate incentive for enrollment of Virginia farmers. Virginia farm land is higher priced than in the Midwest and other farming areas and Virginia farmers may not accept national bidding levels.

Recommendation: **Virginia should continue, and enhance, efforts to educate farmers on program opportunities under the Wetlands Reserve Program.**

Recommendation: **After the first year of implementing the Wetlands Reserve easement program, the program's success in Virginia should be assessed.**

Silvicultural Programs

Silviculture is an economic use of nontidal wetlands which can be compatible with wetlands conservation. Certain commercially valuable species of trees grow well in nontidal wetlands; and the viability of this industry reduces landowner incentive to convert nontidal wetlands to more intensive land uses.

Silvicultural harvesting can have high short term impacts on nontidal wetland values, particularly when conducted during wet seasons. Implementation of Best Management Practices (BMPs) for wetlands, as set forth in the manual Forestry Best Management Practices for Water Quality in Virginia, reduces these impacts and promotes the regeneration of wetlands values.

The Department of Forestry has initiated wetlands identification training for their District Foresters. However, this training has not yet addressed site review and the application of appropriate wetlands BMPs.

Recommendation: **The Department of Forestry should enhance training of District Foresters to include site assessment for the application of wetlands BMPs. The Department of Forestry should identify the resources necessary to enhance the application of wetland BMPs.**

Under current practices, Department of Forestry staff do not actively recommend the implementation of site-specific BMPs during the review of proposed logging sites and operations.

Recommendation: **In its work with forestry activities and logging operators, the Department of Forestry should actively recommend BMPs for logging sites and operations. These recommendations should emphasize pre-season planning to avoid harvesting in wetlands during the wet season.**

As part of their Water Quality BMP Program, the Department of Forestry is assessing BMP compliance among forestry operations in Virginia. This assessment shows a twenty-nine percent increase in the overall use of voluntary water quality BMPs.

Recommendation: **The BMP assessment should be enhanced to include specific evaluations of private forestry compliance with wetlands BMPs.**

Recommendation: **This assessment should be used to guide further forester training and program development in areas where wetlands BMP implementation is found to be insufficient.**

Transportation and Road Construction

Road corridor planning by the Virginia Department of Transportation is currently coordinated with state and federal agencies that have wetlands regulatory responsibilities. Federally-funded road projects undergo an analysis of impacts and alternatives, as required under the National Environmental Policy Act.

The Governor has instituted a process for increasing coordination between the Virginia Department of Transportation and Natural Resource Agencies. Through this initiative, state-funded road projects will undergo more thorough project planning and analysis of impacts and alternatives, improving the protection of nontidal wetlands from the direct impacts of road construction.

Transportation planning and road construction in areas of nontidal wetlands are major public investments which pave the way for secondary impacts on nontidal wetlands as a result of accompanying growth and land development.

Recommendation: **Transportation and Natural Resource Agencies should work together under the Governor's transportation initiative to find ways to address the secondary impacts of growth and land development on areas of dense nontidal wetlands. This process should be coordinated with the comprehensive planning of affected local governments.**

The Virginia Department of Transportation is working to refine and improve the design and construction of nontidal wetland compensatory mitigation (wetlands creation) projects, and is evaluating opportunities for implementing a "mitigation banking" program that would create large areas of created wetlands to compensate for wetlands loss and meet the goal of no net loss.

Recommendation: **Wetlands creation and mitigation banking by the Department of Transportation should continue and should be coordinated with further research on the site-specific values of nontidal wetlands.**

Recommendation: **The Department should ensure that on-site wetlands creation is maintaining the functions of wetlands and that and off-site mitigation banking practices are maintaining the water quality and flood control needs of individual watersheds. All nontidal wetlands lost as a result of road construction should be compensated through wetlands mitigation and mitigation banking.**

Mining

Regulatory oversight and permitting of mining activities by the Department of Mines, Minerals and Energy do not address the protection, management or restoration of nontidal wetlands.

Mining operations in the western portion of the state generally have minimal effects on the natural wetlands found there.

Mineral mining and borrow pits in the Coastal Plain region of Virginia have a significant impact on nontidal wetlands and are converting many nontidal wetlands to deep open water pits.

These operations are not prohibited under existing mineral mining laws or wetlands regulatory programs. Permits for sand and gravel operations are typically granted and do not include requirements for wetlands reclamation.

Recommendation: **Where permits are granted for sand and gravel mining or borrow pits under a § 401 program, permit conditions should address the maintenance and restoration of nontidal wetlands values.**

The protection of nontidal wetlands is addressed under current guidelines for environmental impact assessments of oil and gas operations in Tidewater. Current emphasis on these operations in Tidewater provide a sufficient framework for managing their impacts on nontidal wetlands.

Nonpoint Source Pollution Control

Effective control of nonpoint source pollution in Virginia is important to the protection of nontidal wetlands. The Division of Natural Heritage of the Department of Conservation and Recreation has documented the adverse impacts that degraded water quality can have on the plants and wildlife of nontidal wetlands.

Some Virginia local governments, such as Prince William County and Fairfax County, implement nonpoint source pollution control programs for the protection of their major water supply. The City of Virginia Beach implements a city-wide nonpoint source pollution control program under the optional enabling authority of the Virginia Stormwater Management Law. These local governments have experienced conflicts between the construction of water quality stormwater management ponds and the protection of nontidal wetlands under the Federal § 404 Wetlands Program. These localities state that nontidal wetlands have been impounded and excavated for the construction of these ponds and that potential conflicts between the protection of nontidal wetlands and the construction of water quality management ponds will continue and increase. These localities have each been working with their respective Planning District Commissions to find regional solutions to this problem.

Under federal and state programs for nonpoint source pollution control and nontidal wetlands protection, local governments and the regulated development community will be forced to deal with conflicting requirements unless a reasonable framework is developed for balancing nontidal wetlands protection with the construction of water quality stormwater management ponds.

Managers in a number of fields recommend that site-specific water quality management ponds not be located in nontidal wetlands. While such facilities may help protect water quality, they may also degrade or destroy other wetlands values such as wildlife habitat. Larger regional facilities can be designed to minimize impacts upon environmentally sensitive features, including nontidal wetlands.

Recommendation: **The Water Control Board, in cooperation with the Department of Conservation and Recreation, the Chesapeake Bay Local Assistance Department and affected local governments, should develop guidelines for coordinating the protection of nontidal wetlands and the management of nonpoint source pollution. These guidelines should be designed to assist localities in the development of watershed management plans that will be agreed upon by state and federal permitting agencies involved in wetlands protection and nonpoint source pollution control.**

Recommendation: **The Water Control Board, the Department of Conservation and Recreation and the Chesapeake Bay Local Assistance Department should coordinate and agree on an approach for achieving the objectives of their respective programs related to nonpoint source pollution control and nontidal wetlands.**

The most cost-efficient location of larger "regional" stormwater management ponds for nonpoint source pollution control is often within streams and riparian nontidal wetlands. Under certain conditions of land development, topography and types of nontidal wetlands, the location of these ponds in riparian areas is also an environmentally sound balance for water quality control and nontidal wetlands protection. However, the loss of certain types and acreage of nontidal wetlands for stormwater management ponds is not justified.

Recommendation: **In the classification and ranking of nontidal wetlands, Virginia should designate locations and classes of high value wetlands which will be protected from nonpoint source pollution control facilities and related impoundments and excavations.**

Local Land-use Programs

In planning for growth, local governments typically assume the full development potential of land parcels. However, the presence of nontidal wetlands can reduce this development potential. Where parcels of land are substantially affected by nontidal wetlands regulation, there may be opportunities for increasing development intensities (development credits) on the upland portions of the parcel. The provision, by local governments, of development credits on the upland portions of regulated parcels can provide economic benefits for landowners in a manner consistent with nontidal wetland protection and the planned density and infrastructure of an area.

Recommendation: **Local governments should be encouraged to administer land-use programs which increase allowed land-use intensities on the upland portions of parcels which are substantially affected by nontidal wetlands and floodplain regulation.**

Floodplain Management

Over 250 of the approximately 280 flood-prone localities in Virginia are participating in the National Flood Insurance Program (NFIP) established in 1968. Even though many nontidal wetlands occur in floodplains, current local floodplain ordinances are designed to meet the requirements of the NFIP and are not designed to protect floodplains, nontidal wetlands or their values.

The Community Rating System (CRS), a new program in the NFIP, provides an opportunity for improved wetlands conservation through local floodplain ordinances. This new program offers reduced flood insurance rates for landowners in localities which meet certain standards, including the protection of open spaces and nontidal wetlands. One Virginia locality is currently enrolled in the CRS program, and ten others are in the application process.

The Department of Conservation and Recreation has recently developed The Floodplain Management Plan for the Commonwealth of Virginia in response to a 1989 amendment to the Flood Damage Reduction Act. The Plan recognizes the substantial connection between flood loss reduction and protecting the natural and beneficial values of wetlands and floodplains.

Recommendation: **The Department of Conservation and Recreation, as lead floodplain management agency, and other agencies including the U.S. Geological Survey, should research and evaluate the various types of nontidal wetlands in Virginia for their flood storage capabilities.**

Recommendation: **Information on the flood storage functions of nontidal wetlands should be incorporated into nontidal wetlands management decisions and provided to local governments for the purposes of planning, regulation and acquisition under the Community Rating System.**

Recommendation: **As Virginia localities develop Community Rating System programs, the Department of Conservation and Recreation should evaluate the effect of these programs on the natural and beneficial values of nontidal wetlands and floodplains.**

Acquisition and Easements

The 1990 Virginia Outdoors Plan provides direction for state, local, federal, and private organizations to acquire and manage open-space lands. The Plan identifies the protection of Virginia's wetlands, including tidal and nontidal, as a "priority one" issue. The Plan makes two recommendations concerning land management tools which affect nontidal wetlands: (1) "Emphasize preserving unique or vulnerable wetlands through acquisition and conservation easement programs"; and (2) "Develop tax incentives...to be effective in encouraging private citizens and local governments to protect wetland areas."

Numerous programs currently support these goals. Certain agencies acquire lands to preserve natural values, while others obtain lands for open-space recreation purposes. A number of vehicles exist for private property owners to protect the open-space and natural resource values of designated lands.

Successful protection of nontidal wetlands and other resource areas through acquisition or easements requires the ability to inventory and classify lands and resources, purchase these lands and resources as they become available, and manage these lands and resources to maintain their values.

The Natural Heritage Inventory system of Department of Conservation and Recreation inventories and classifies nontidal wetlands based on their values as rare, threatened or endangered species habitat.

The Department of Conservation and Recreation is currently developing a broader-based Land Classification System for evaluating land purchases.

Recommendation: **The Department of Conservation and Recreation should include nontidal wetlands as an important and sensitive natural resource in its evolving Land Classification System and should consider the water quality protection, flood buffering and habitat values of nontidal wetlands in determining the importance of individual nontidal wetlands. Virginia should continue to place a high priority on purchasing valuable nontidal wetland and natural heritage areas.**

The Natural Heritage Program implements authority for registration or dedication of state-owned lands to protect and manage natural heritage resources including nontidal wetlands.

Recommendation: **As staff and resources permit, the Natural Heritage Program should assist other agencies in developing or maintaining current inventories and management plans for protecting nontidal wetlands on state-owned lands, as appropriate, using the Department of Conservation and Recreation's Land Classification System.**

Acquisition of nontidal wetlands has been hindered by a requirement of the Department of General Services which prohibits state purchase of floodplain properties. This prohibition is designed to protect state development and capital improvement projects and is not appropriate in cases in which the acquisition is intended for natural resource protection.

Recommendation: **Lands acquisition for the protection of nontidal wetlands and related resources should be exempted from Department of General Services requirements prohibiting the purchase of floodplains. The requirement of the Department of General Services Directive #1, Section IV.1:F should be amended to address only acquisition projects where capital improvement is proposed.**

State-owned lands, which are identified for surplus due to site constraints (particularly nontidal wetlands), may contain significant nontidal wetlands resources. These surplus lands provide an opportunity for nontidal wetlands protection by the state.

Recommendation: **Natural Heritage Resource Inventories of state-owned lands should be expanded to include the review of all lands proposed for surplus for the purpose of protecting valuable natural resources including nontidal wetlands.**

Under The Conservation Easement Act, local non-profit conservation organizations are empowered to hold easements for the purpose of natural resource protection. These organizations would benefit from the expertise and experience in natural area conservation of the Division of Natural Heritage of the Department of Conservation and Recreation.

Recommendation: **As local non-profit conservation organizations are established and pursue conservation holdings and easements under the authority of the Virginia Conservation Easement Act, the Department of Conservation and Recreation, as staff and resources permit, should assist these groups in the identification of valuable nontidal wetlands and other natural resources.**

Research, Classification and Mapping

Though current knowledge of the functions performed by nontidal wetlands is expanding and capable of supporting management programs, there are opportunities to incorporate more site-specific information into management decisions.

Recommendation: **Appropriate agencies and institutions should be supported through available funds to continue research into the functions performed by Virginia's nontidal wetlands. This research should address: groundwater discharge and recharge; habitat for wildlife, including rare and endangered species; flood storage capacity; shoreline anchoring and dissipation of water energy; maintenance of water quality; and aquatic food chain support.**

Recommendation: **The State Water Control Board, in cooperation with other appropriate agencies and institutions, should develop site-specific techniques for assessing the functions performed by nontidal wetlands. Funding for such a project may be made available through the Council on the Environment from federal grant funds under § 309 of the Coastal Zone Management Act.**

The Department of Conservation and Recreation, the Council on the Environment and other agencies and institutions within the Commonwealth have developed, and are continuing to develop, natural resource data bases and information management systems. Unified maps of nontidal wetlands, floodplains and Chesapeake Bay Preservation Areas would greatly assist local governments and the private development community to protect water-related natural resources and conduct site-planning for land development projects.

Recommendation: **Appropriate agencies within the Secretariat of Natural Resources should investigate the feasibility of providing local governments with unified maps of nontidal wetlands, the one hundred year floodplain and (in Tidewater) Chesapeake Bay Preservation Areas.**