
VITAL HABITATS PLAN

GOAL

Conserve and protect vital fish and wildlife habitats and maintain the natural heritage of the Albemarle-Pamlico region.

OBJECTIVE A: PROMOTE REGIONAL PLANNING TO PROTECT AND RESTORE THE NATURAL HERITAGE OF THE APES REGION.

Strategy: Regional planning would guide the acquisition, protection and restoration of vital habitats. Plans would include goals for ensuring that protection efforts do not become fragmented but are consolidated and targeted toward regional needs for the survival of wildlife and fisheries and the protection of natural heritage. Ecosystem plans would be developed for each major drainage basin in the region. This approach would consider the value of each site proposed for protection at the watershed and regional levels. Plans would consider important ecological processes as well as regional economic activities which rely on those processes at the landscape scale. Plans would also consider broader watershed protection goals, management strategies such as protected corridors and buffers, and basinwide water quality planning initiatives. Maps of the region's vital habitats and land uses, such as Figure 20 showing ecologically significant natural communities rare species, would be completed and updated in order to develop basin-specific ecosystem plans.

Management Action 1: Develop ecosystem protection and restoration plans (basinwide ecosystem plans) for each river basin in the region. Individual basinwide ecosystem plans will be completed and implemented according to the schedule established for basinwide water quality management plans. (See Objective A in the Water Quality Plan.) Plans should establish coordinated priorities for protecting habitats and critical areas in each basin, and should target areas most vital to the survival of wildlife and fisheries and the protection of natural heritage.

Explanation: *Protecting vital habitats involves a great number of agencies and organizations. The coordination of their efforts with strategies that target management at the most critical areas would be best accomplished through basinwide ecosystem planning. Planning on a river basin level encompasses important ecological habitats that do not correspond to local jurisdictional boundaries. Restoration plans for river basins would provide a means for assessing the sources and causes of habitat damage and enable the appropriate agencies and organizations to coordinate priorities within the entire basin.*

Critical Steps

1. The primary agencies involved with vital habitat protection in the APES region include: the Wildlife Resources Commission (WRC); the Division of Marine Fisheries (DMF); the Division of Parks and Recreation (DPR); the Division of Coastal Management (DCM); the Division of Forest Resources (DFR); the Forestry Advisory Council; the U.S. Fish and Wildlife Service (USFWS); and the National Oceanic and Atmospheric Administration (NOAA). These agencies would form an inter-agency committee to develop ecosystem protection plans for each drainage basin. This committee would work closely with the Regional Councils (See Implementation Plan Objective A Management Action 1).
2. Under the auspices of The Nature Conservancy (TNC), USFWS, WRC, U.S. Army Corps of Engineers (USACE) and DPR, in coordination with local governments, a vital habitat plan is being developed for the Roanoke basin. This plan should serve as a model for the development of plans for each of the remaining basins.
3. Basinwide ecosystem plans would be developed consecutively, working as closely as possible with water quality basinwide plans, with all five to be developed by 1999. Ecosystem plans would include a formal endorsement and agreement by all management agencies to implement the plans.

4. The interagency committee would consider basinwide and regional needs for protecting wildlife, fisheries and natural heritage. Issues, such as developing processes that address old-growth, biodiversity, and water quality forestry issues; providing protective buffers and corridors; and managing in-holdings, will be evaluated. Buffers protect particularly sensitive natural communities or rare species habitat. Protected corridors link natural areas and allow wildlife to move safely within a landscape. Corridors also protect the health of whole populations within a landscape by reducing inbreeding or allowing species exterminated in one area to recolonize in another. Incorporating in-holdings, or "holes" into protected areas, can reduce threats to species that are particularly sensitive to habitat fragmentation.
5. A Forestry, Fish and Wildlife (FFW) Coordinating Committee would be created to promote the availability and distribution of forestry resource information and management to maximize silvicultural production and fish and wildlife habitat value. The FFW would also provide technical assistance to the interagency committee for considering local site-specific needs for protecting rare species habitat as described in the USFWS Endangered Species Recovery Plans for federally listed species and equivalent plans for state listed species.
6. Plans would include criteria for setting priorities and assessing protection and restoration efforts and would detail the types and amounts of habitats in the region requiring protection (See Objective B, Management Action 6 for details of a fishery habitat restoration and a wetlands habitat restoration program.)
7. Involved agencies would make every effort to coordinate basinwide ecosystem plans with basinwide water quality plans developed by the Division of Environmental Management (DEM).
8. The interagency committee would also consider the purchase of lands adjacent to waters designated as vital fisheries habitats as a means of habitat conservation.

Evaluation Method

This Management Action would be evaluated by assessing the progress of the interagency committee in completing each ecosystem plan. The degree to which regional goals are met and outlined in each individual basin plan will also be considered.

Costs and Economic Considerations

In general, better coordination and planning focused on the APES region will not result in significant incremental costs to the existing agencies and programs involved. DPR will be considered the lead agency for this management action and one additional staff member would be needed at an annual cost of \$50,000 to coordinate planning activities. Additional costs to state and federal agencies from planning and coordinating activities would be met with existing resources. Costs of materials, data acquisition, mapping, and other miscellaneous resources are covered in the other management actions in the Vital Habitat Plan. These activities have the potential to generate savings and/or greater efficiency by redirecting and sharing agency resources to achieve common goals. Because of these factors, the net impact on the costs of actual management and administration cannot be determined. The most likely impact is improved efficiency or productivity rather than a change in overall spending. The goal of this Management Action, like that of the CCMP as a whole, is to better manage government in order to achieve the greatest environmental benefit for a given level of public spending. Ecosystem planning in and of itself would not be expected to affect land values. All acquisitions of natural areas discussed in this plan (see Management Actions 1 and 2 of Objective B) would be obtained through voluntary sales or donations of land and easements. Ecosystem plans could help direct the focus of regulatory programs, but they would not necessarily change the overall economic impact of regulations or lead to more stringent regulations. The main economic impact of this Management Action is likely to be more efficiently used public funds. Making habitat protection goals and priorities a better focus in the public eye would make people more aware of the value of surrounding ecological resources. Basinwide ecosystem plans, for instance, could serve as guides to landowners, communities, local governments and others wishing to protect these resources in their areas. Basinwide ecosystem plans could also help in the development of more detailed environmental impact analyses, species protection plans, etc., which need to be developed by government agencies, developers, and others. A better planning process and clear plans for the future would tend to reduce uncertainties regarding major habitat protection projects, allowing communities to avoid unexpected negative impacts and to capitalize as much as possible on the opportunities these projects present, such as nature-based tourism, recreation, and sustainable forestry and agriculture.

Funding Strategy

The DPR would apply for funds from the National Park Service's Statewide Outdoor Recreational Planning Grants. If grants are unavailable, a \$50,000 appropriation would be needed from the General Assembly.

Management Action 2: Develop and maintain accurate maps and records of wetlands, fisheries habitats, federal and state endangered species and their habitats, natural areas, and natural communities.

Explanation: Accurate maps of natural areas are essential to the development of basinwide ecosystem plans. They allow for more accurate analysis of protection and enhancement priorities for various habitat types. A biological inventory of the region was part of the Albemarle-Pamlico Study and additional detailed inventory and monitoring projects would be completed for individual counties and for the most significant natural areas. This information would be kept current and accurate. Up-to-date, readily available biological inventories, maps, and data would provide local governments, planners, land managers, and private citizens with the information they need to protect habitats.

Critical Steps

1. The Department of Environment, Health, and Natural Resources (DEHNR) would develop coordinated policies and definitions for habitat mapping to ensure the compatibility of data sets.
2. The Division of Marine Fisheries (DMF) would complete maps of shellfish beds and update them at least every 10 years, or sooner if appropriate, to analyze changes in their status.
3. DMF would update maps of nurseries and anadromous fish spawning areas at least every 10 years, or sooner if appropriate, to assess trends and analyze threats.

4. DMF, with the assistance of the Division of Coastal Management (DCM), would continue efforts made by the National Oceanic and Atmospheric Administration (NOAA) to map submerged aquatic vegetation throughout the APES region and update the maps as necessary to be useful for tracking changes.
5. The Division of Parks and Recreation's (DPR) Natural Heritage Program (NHP) would continue to maintain regional maps of ecologically significant areas, known as Natural Heritage Priority Areas, including rare plant and animal habitat and rare or representative natural communities and continue to maintain updated Geographic Information Systems (GIS) database layers indicating areas that are managed by the public or private sector for preservation. The regional maps would be continuously revised as information becomes available. This information would allow for a regional assessment of ecological change.
6. To complement the existing regional survey of natural communities, and to allow for a closer assessment of important habitats, the NHP would work with the region's 36 counties to complete local natural heritage surveys. These surveys would be completed by 2005.
7. The U.S. Fish and Wildlife Service (USFWS) would complete National Wetland Inventory maps for the APES region. National Wetlands Inventory maps would be updated regularly to analyze changes in habitat status and trends. Other federal and state programs that map wetlands - including the NOAA Coastal Ocean Program, Environmental Protection Agency (EPA) and DCM's Advanced Identification (ADID) program, U.S. Forestry Service's (USFS) Forest Inventory and Analysis Database, U.S. Soil Conservation Service (SCS) Swampbuster maps and Landsat Thematic Mapper - would continue to complement USFWS efforts and make available additional region-specific analyses of the status and trends of wetland habitats.
8. SCS would complete and digitize soil survey maps for any remaining unmapped county in the APES region.
9. DEM and the Center for Geographic Information and Analysis (CGIA) would work toward completing an updated land use and land cover database that would aid in protecting wetlands and other habitats throughout the watershed. CGIA would update the database at least every 10 years, and every five years if feasible.

10. The Nature Conservancy (TNC) would aid in mapping ecologically significant areas on lands they own or help manage. The Conservancy's efforts to map ecologically significant areas in the lower Roanoke River basin will enhance the natural areas database by providing more intensive survey information for this important region.
11. DMF, Wildlife Resources Commission (WRC), DPR, and USFWS would identify and list by 1995 the essential habitats of all endangered and threatened species.
12. DEM and DCM, with assistance from the Army Corps of Engineers (USACE), would map and track permits to assess the impact of coastal land use on vital habitats by 1995.
13. The maps and mapping updates described in this management action would be stored in CGIA's Geographic Information Systems (GIS) to promote availability for conservation planning.
14. CGIA would build coordinated databases to strengthen the flow of information between agencies and between government and non-government organizations interested in habitat protection.

Evaluation Method

Relevant agencies will monitor their respective maps in the CGIA GIS database to ensure that they are completed and regularly updated.

Costs and Economic Considerations

The NHP would require approximately \$85,000 per year in order to complete inventories for all counties in the APES region on a 10 year cycle. CGIA would require \$50,000 per year to support a technical staff member responsible for producing necessary maps. SCS would require funding, based on the average cost of \$1.25 per acre, to complete soil survey maps. Most other elements of this action are expected to be funded through existing authorizations (for instance, by redirecting budget priorities). The information and data processing capability generated by this strategy will improve the productivity of resource management agencies and others who use geographic data. GIS can provide an efficient way to track and analyze complex environmental data from thousands of geographic points in an area over time. This capability can facilitate management, planning, enforcement, and research.

Funding Strategy

DPR would apply for funds from the State Recreation and Natural Heritage Trust Fund. If funds are unavailable, an \$85,000 appropriation would be needed from the General Assembly. CGIA would acquire funding from EPA's State Development Fund for Wetlands Protection and through existing cost-recovery based agreements. SCS would acquire funding from existing federal sources and from the state Division of Soil and Water Conservation (DSWC). Additional funding would be provided by the individual counties in which mapping was performed.

Management Action 3: Expand programs to identify wetlands on a regional scale and to evaluate and rank wetland function.

Explanation: *An accurate identification and evaluation of wetlands, in advance of proposed activities that disturb wetlands, improves our ability to protect the most critical wetlands and to make wetlands permitting more predictable for developers and local governments. An Advanced Identification (ADID) program is a multi-agency effort that tests a variety of methods to evaluate wetlands. Under this program, wetlands regulations would not be expanded. Instead, the wetlands permitting process would become more efficient.*

Critical Steps

1. Expand programs that 1) develop wetlands mapping methods and 2) assess wetlands functions. An ADID program is currently evaluating wetlands in Carteret County. Results from this ADID can be used to determine wetlands with the highest functional significance which should be avoided and those with lower functional significance which may be altered, with appropriate mitigation strategies, resulting in minimal regional impacts on water quality, hydrology and habitat. Federal and state agencies involved in the current ADID project include the Division of Coastal Management (DCM), the Division of Environmental

Management (DEM), the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE), and the U.S. Fish and Wildlife Service (USFWS).

2. DCM is planning to use ADID wetland evaluation methods in all coastal counties. The appropriate agencies would expand this methodology in the remaining counties in the APES region.
3. Other methods that comprehensively identify and evaluate wetlands should be considered.

Evaluation Method

Effectiveness of ADID or other wetland identification and evaluation programs would be assessed to determine the following: 1) whether all wetlands in the region were accurately mapped and 2) whether all wetland functions were considered.

Costs and Economic Considerations

The cost to DCM and DEM for evaluating the ADID project in Carteret County is estimated to be \$50,000. Expanded ADID efforts would be funded through federal grants. The economic impact of implementing ADID region-wide is contingent on how the ADID program is designed and how resulting data and maps are used by state, federal, and local governments. As a general statement, wetlands identification and mapping at the county and regional scale can help reduce landowners' uncertainty about the likelihood of receiving permits for development and would allow local governments more latitude in planning for growth that does not degrade important ecological resources.

Funding Strategy

To evaluate the existing ADID project, DCM would acquire funding from Section 309 of the federal Coastal Zone Management Act (CZMA) supplied by NOAA. DCM would also apply for an additional \$70,000 from CZMA Section 309 to fund expected local projects within Carteret County.

**OBJECTIVE B: PROMOTE THE RESPONSIBLE
STEWARDSHIP, PROTECTION, AND
CONSERVATION OF VALUABLE NATURAL AREAS
IN THE APES REGION.**

Strategy: Protecting habitats that are vital to the survival of fish and wildlife has been successful in North Carolina. Preserving natural areas also enhances environmental quality and provides socioeconomic benefits. A cooperative effort among many federal and state agencies, private resource and conservation groups, and local land trusts has provided a variety of regulatory and nonregulatory measures that protect habitats. Nonregulatory measures include acquisition, conservation easements, registry and dedication of land as natural areas, technical assistance for conservation, cooperative management agreements and incentives to landowners to maintain, restore, and enhance important natural resources. Impacts of land acquisition on the local tax base should be considered when preserving natural areas. Stewardship and cost share programs would be expanded with assistance from the Forest Stewardship Program, the Department of Agriculture (DA), USDA Agricultural Stabilization and Conservation Service, and local U.S. Soil and Water Conservation Districts. Public education and technical assistance would be provided to assist public and private landowners with responsible management of natural resources.

Management Action 1: Bring areas identified as having the highest priority for protection into public ownership and/or management. Expand funding for public acquisition of park lands, gamelands, coastal reserves, and other natural areas.

Explanation: Natural areas that are most vital to maintaining the region's natural heritage have been identified. Further priorities will be determined through basinwide ecosystem planning. Where possible,

voluntary acquisition is an important tool for protecting these areas. In addition to preserving rare species and natural communities, public areas that are managed by different agencies can serve a variety of purposes such as recreation, education, or hunting.

Critical Steps

1. The basinwide ecosystem plans would identify priority areas for the protection of rare species habitat and rare or representative natural communities. Public agencies and private conservation organizations would target these priority areas for voluntary acquisition and conservation easements. While voluntary acquisition involves willing sellers or donors, the impacts of land acquisition on the local tax base should always be considered when preserving natural areas. Acquired lands would be dedicated and managed as protected natural areas.
2. The Division of Parks and Recreation's (DPR) Natural Heritage Program (NHP) has surveyed the APES region's natural areas and identified specific rare species habitat and rare or representative natural communities warranting the fullest protection possible (Frost et al. 1990, LeGrand et al. 1992, Smith et al. 1993). The surveys identified at least 23,000 acres of habitat that would be considered as top priority for protection in basinwide ecosystem plans.

These areas include the following natural communities:

basic mesic forest (coastal plain subtype)	coastal fringe sandhill
basic mesic forest (piedmont subtype)	coastal plain marl outcrop
coastal fringe evergreen forest	diabase glade
non-riverine swamp forest	floodplain pool
non-riverine wet hardwood forest	granitic flatrock
peatland Atlantic white cedar forest	piedmont/mountain swamp forest
pine savanna	small depression pocosin
small depression pond	ultramafic outcrop barren
tidal freshwater marsh (freshwater variant)	upland depression swamp forest

and maritime forest, and other high-priority barrier island natural communities, including:

interdune pond
maritime dry grassland
maritime shrub swamp
maritime wet grassland

maritime deciduous forest
maritime evergreen forest
maritime swamp forest

3. Additional areas to target for voluntary acquisition and conservation easements in the basinwide ecosystem plans have been identified in the National Wetlands Priority Conservation Plan (NWPCP). This plan was developed by the U.S. Fish and Wildlife Service (USFWS) with input from more than 70 state and federal agencies, organizations and individuals knowledgeable of the state's wetlands. The primary purpose of the NWPCP is to aid decision makers in the identification of the types and locations of wetlands that warrant consideration for acquisition using Land and Water Conservation Fund appropriations. In the APES region, it identifies 13 areas that include the region's best examples of wetlands. These areas include approximately 164,000 acres that were privately owned as of December 1992. Some of these areas include rare species habitat or rare or representative natural communities listed in Critical Step 2 above. These areas would be targeted for voluntary acquisition and conservation easements. Purchases made in these targeted areas would be preceded by consideration of the impacts of that purchase to the local community.
4. The voluntary sale or donation of conservation easements would be encouraged in circumstances where acquiring full title to a tract of land is less critical from a conservation standpoint. Acquiring easements also would be appropriate when the current owner wishes to retain at least partial interest in the property. A conservation easement is a voluntary, binding legal agreement in which the land owner sells or donates some or all of her or his rights to develop or use the land, while still maintaining ownership. Conservation easements prohibit development or limit certain activities in order to protect important natural, cultural or open-space resources.
5. Vital habitats owned by the state, as identified through basinwide ecosystem plans, would be dedicated under the North Carolina Nature Preserves Act, the State Nature and Historic Preserve Dedication Act or other appropriate mechanism as soon as possible to ensure their permanent protection.

6. Federally-owned vital habitats identified through the basinwide ecosystem plans would be given similar protective status.
7. Once a dedicated natural area has been placed in public ownership, the responsible agency would develop and implement a management plan as soon as possible.

Evaluation Method

These steps would be evaluated by monitoring changes in acreage as classified by habitat type, current use and management, functional status and owner type. Priorities would be reevaluated periodically, taking into consideration new research as well as changes in habitat threats, policy goals and market conditions.

Costs and Economic Considerations

Funding for administrative costs of acquisition and management activities would continue to come from existing sources. Cost estimates for acquisitions and management of acquired land will depend on the priorities set through the basinwide ecosystem planning process. Using current estimates of the types and amounts of natural areas that are likely to be recommended for protection, acquisition costs to acquire approximately 25,000 acres over the next ten years would fall between \$35 million and \$55 million. However, the actual numbers are likely to change as the ecosystem plans are developed. Some acquisitions could initially be made by private non-profit organizations rather than by government agencies, but nearly all lands are typically sold to government agencies over the long term. Areas of regional importance might be protected by local governments, but in terms of overall acreage these land areas are likely to be relatively small. Because these acquisitions would be entirely voluntary, any willing sale or donation would result in some positive benefit (monetary and/or non-monetary) to participating landowners. Large-scale acquisitions would need to consider any potential negative economic impacts if important economic opportunities are reduced. In areas where a large proportion of the land base is unsuitable or is already restricted from such uses, removing land from potential commercial use could in turn reduce potential local employment as well as reduce the local tax base. These impacts would have to be considered in any decision to purchase large tracts of land in any one area. When considered from a regional perspective, the impacts of these acquisitions on employment and local tax bases would not be large. This is because the overall acreage being acquired is small relative to other available tracts of land in most counties and since, in most cases, expected levels of development could be accommodated on these other available tracts. The value of (and tax

revenues from) some properties adjacent to those protected could rise. However, in some cases farmland adjacent to protected natural areas could decrease in value due to pest problems, potential fire hazards, extensive public use of adjacent lands or the loss of customary uses such as hunting or fishing. In addition to providing many environmental benefits, this Management Action would likely boost economic activity related to recreation and tourism. Facilities such as public access boat ramps, beaches, visitor and interpretive centers, etc. would generate revenue for local economies and could improve recreational opportunities for nearby residents.

Funding Strategy

To cover any additional administrative costs of public acquisition and management of important natural areas, funding may be acquired from the following potential sources:

Conservation land trusts

USDA - Agricultural Conservation Program, Conservation Reserve Program, Wetlands Reserve Program, Small Watersheds and Flood Protection Program

NOAA - Coastal Reserve Program, National Estuarine Research Reserve Program (NOAA has provided matching funds for both the Coastal Reserve System and the National Estuarine Research Reserve. Matching funds have come from state appropriations, the N.C. Recreation and Natural Area Trust Fund, and donations)

US Fish and Wildlife Service - Federal Aid to Wildlife Restoration (Pittman-Robinson), Cooperative Endangered Species Conservation Fund, North American Wetland Grant, Land and Water Conservation Fund

NC Nongame and Endangered Wildlife Fund

NC Recreation and Natural Heritage Trust Fund

NC Wildlife Resources Commission gamelands acquisitions

Special state appropriations/bond issues for natural areas and parks

Sources of funding for acquisitions should be identified as part of the planning process.

Management Action 2: Provide incentives and technical assistance for the protection of privately owned vital habitats.

Explanation: High-priority natural areas that are not brought into public ownership can be targeted for private conservation. Efforts would be expanded to inform private land owners of the ecological values of their land, to advise them on appropriate management strategies, and to help them explore options for voluntary protection. Where possible, conservation organizations could acquire vital habitats in order to consolidate management and protection efforts.

Critical Steps

1. Important natural areas would be obtained and managed by private conservation groups such as the National Audubon Society (NAS), The Nature Conservancy (TNC), the Conservation Trust of North Carolina, the Coastal Land Trust, local land trusts, and individual landowners.
2. Lead agencies would expand existing stewardship programs and other conservation and incentive programs in the region. These programs would focus on vital habitats identified through the basinwide ecosystem plans described under Objective A. Programs include:

Forest Stewardship Program (lead agency - Division of Forest Resources-DFR)

Wetlands Reserve Program and Conservation Reserve Program (lead agencies - Department of Agriculture-DA, USDA Agricultural Stabilization and Conservation Service, and local Soil and Water Conservation Districts)

Natural Heritage Program (NHP) Registry and Dedication of private land under the Nature Preserves Act (lead agency - Division of Parks and Recreation-DPR)

Partners for Wildlife (lead agency - U.S. Fish and Wildlife Service-

USFWS)
Wildlife Resources Commission (WRC)

3. DPR would need two staff persons for the NHP to coordinate private outreach and incentive programs that would assist land owners in registering or dedicating their land.
4. The Division of Coastal Management (DCM) will continue to develop a guide for managing privately-owned wetlands. Funding will be provided through NOAA Coastal Zone Management Act Section 306 and 309 Grants.

Evaluation Method

The NHP would monitor changes in protected acreage as classified by habitat and owner type, current use and management, functional status, and by tracking landowner participation in habitat protection programs.

Costs and Economic Considerations

The cost of this Management Action to state and federal agencies is estimated to be \$524,000 per year and would include the hiring of personnel, site visits, mapping, manuals, plan preparation and certification, and other administrative costs. This figure is based solely on the following anticipated activities: expansion of the Forest Stewardship Program (cost=\$370,000); development of the USFWS' private land stewardship plan (cost=\$50,000); increased staff for the NHP (cost=\$100,000); and publication by DCM of a land use guide for private land owners (cost=\$4,000). Private landowners would incur the costs of planning and implementing conservation measures on their land. However, because their participation is voluntary, landowners presumably get at least enough benefits to induce them to participate. These benefits could be monetary (tax advantages, cost share reimbursements) and/or non-monetary (the satisfaction of helping to conserve resources for future generations). At the same time, the general public derives several environmental benefits from these efforts, particularly when public conservation and stewardship programs are targeted at high priority natural areas. When this occurs, the public gets the greatest level of environmental benefit per dollar spent on technical assistance and incentives to private landowners.

Funding Strategy

The expansion of the Forestry Stewardship Program would require an expansion appropriation from the General Assembly. The USFWS would provide funding from their "Partners for Wildlife" program for private land stewardship plan development. Two additional staff positions in the NHP would require an expansion appropriation from the General Assembly. The National Wetlands Reserve Program is currently not funded. There is, however, strong support for this program from the Soil Conservation Service, as well as private landowners, and funding should be considered for developing this program.

OBJECTIVE C: MAINTAIN, RESTORE, AND ENHANCE VITAL HABITAT FUNCTIONS TO ENSURE THE SURVIVAL OF WILDLIFE AND FISHERIES.

Strategy: Better coordination among public agencies including the Division of Parks and Recreation (DPR), the Wildlife Resources Commission (WRC), the Division of Marine Fisheries (DMF), the Division of Coastal Management (DCM), and the Division of Forest Resources (DFR), along with priority-setting objectives included in basinwide ecosystem plans, would improve the effectiveness of future restoration and enhancement projects. Attempts at protecting a region's vital fisheries, rare species habitat, rare or representative natural communities, and other vital wildlife habitat would be directed to where it is most needed and cost-effective. Protection of fisheries habitats, including submerged aquatic vegetation, shellfish beds, and spawning areas, would be modeled after existing protection given to nurseries. Efforts to develop effective restoration and protection technologies would continue. The Wetlands Enhancement, Restoration and Creation (WERC) program sets priorities for type- and site-specific wetlands restoration projects and would help focus the highest level of protection on those wetlands most vital to water quality and habitat. The feasibility of a mitigation bank and other mechanisms for coordinating and consolidating mitigation efforts would be evaluated.

Management Action 1: Enhance the ability of state and federal agencies to enforce existing wetlands regulations by 1995.

Explanation: *Strengthening enforcement of current wetlands regulations and ensuring compliance with the existing permitting process are essential to minimizing inappropriate development in wetlands areas.*

Aerial monitoring would be expanded to increase coverage and ensure efficient enforcement. Enhanced enforcement would prevent some actors from gaining an unfair advantage through their failure to comply with wetlands regulations.

Critical Steps

1. In coastal areas, aerial compliance monitoring allows for the sighting of wetlands permit violations in an efficient and comprehensive manner. This technique could improve monitoring statewide if expanded in coverage. Enhanced wetlands data collection and mapping efforts including overflights and aerial photography would be performed by DEM and DCM. Technical assistance would also be provided by the Center for Geographic Information and Analysis (CGIA) and the Soil Conservation Service (SCS).
2. The General Assembly would be asked to provide funds to increase staff in DEM to enhance and coordinate enforcement efforts of the 401 Water Quality Certification Program with the Army Corps of Engineers (USACE).

Evaluation Method

Wetlands trend analysis, conducted on regular intervals by DEM, will help to identify significant wetland changes and to evaluate and revise permitting and monitoring activities.

Costs and Economic Considerations

In order to develop a more effective 401 Certification Program under the auspices of a General Permit, three new positions in DEM would be created to review and enforce wetlands regulations. One staff member would be stationed in a regional office for enforcement through groundtruthing efforts, and the remaining two staff members would be involved in enforcement efforts in Raleigh. The annual cost of these new positions, will be \$150,000. This action would accelerate wetland permitting decisions, improve water quality, and focus regulatory and mitigative efforts on valuable wetlands. Costs are associated with compliance, yet the failure of individuals to correct regulatory violations incurs costs to those already in compliance. Enhanced enforcement ensures that all actors are affected

equally. The benefits of enhanced enforcement efforts are improvements in wildlife habitat, water quality, and overall river basin functioning arising from retarding or halting the degradation of wetlands. The magnitude of these benefits would depend on the success of enforcement efforts and the cumulative negative environmental impacts that are avoided because of better compliance. It is important to note that these benefits should be judged not in comparison to the current state of wetlands, but to the level of degradation that would be expected in the absence of improved enforcement efforts.

Funding Strategy

DEM would request an expansion budget from the General Assembly for the fiscal year 1994-1995.

Management Action 2: Strengthen regulatory programs to protect vital fisheries habitats, which include submerged aquatic vegetation, shellfish beds, and spawning areas by 1995.

Explanation: Vital fisheries habitats are threatened by water quality degradation, physical destruction and the cumulative impacts of development in the region. Protecting areas in which aquatic organisms breed, live, and feed is essential to the successful propagation of many finfish and shellfish species. Increased protection for vital fisheries habitats will help maintain healthy fish populations for abundant commercial and recreational harvests.

Critical Steps

1. The Marine Fisheries Commission (MFC) would designate submerged aquatic vegetation and shellfish beds as vital fisheries habitats. MFC and the Wildlife Resources Commission (WRC) jointly would designate anadromous fish spawning areas, also as vital fisheries habitats. MFC recently has taken initial steps toward this action.

2. The Division of Marine Fisheries (DMF) would delineate these vital fisheries habitats with assistance from the WRC and approval from the MFC. Delineation would be accomplished through intensive, site-specific evaluations as currently is the procedure for primary and secondary nurseries. To sufficiently protect vital fisheries, delineation boundaries would include adequate aquatic buffers.
3. After vital fisheries habitats have been designated, appropriate use standards would be applied by regulatory commissions. Several practices already are restricted in these areas. For example, the Coastal Resources Commission (CRC) protects nurseries, shellfish beds and submerged aquatic vegetation from navigation channels and dredging for boat basins. The following practices would be considered for restriction by regulatory commissions in and near designated spawning areas, shellfish beds and submerged aquatic vegetation beds: long haul seine fishing, trawling, clam kicking, dredging, and boating practices that disturb habitats. These policies would build on a protection base provided by existing CAMA and MFC rules.
4. The Environmental Management Commission (EMC) would consider specific water quality protection for vital fisheries habitats. A supplemental water quality classification such as High Quality Water (HQW) could be used for designated spawning, shellfish and submerged aquatic vegetation areas, as is done for primary nurseries. In applying specific criteria or classifications, the EMC would consider maintaining appropriate levels for the following parameters:
 - a. In anadromous spawning areas - dissolved oxygen, nutrients, pH, suspended sediment, water flows, temperature, inorganic solids, salinity, lead, chlorine and aluminum.
 - b. For submerged aquatic vegetation - light transparency, salinity and nitrate levels.
 - c. For submerged aquatic vegetation and shellfish areas - concentrations of inorganic suspended solids and nutrients.
5. The CRC, EMC and MFC would coordinate policies and rules regarding vital fisheries habitats. The DCM, DEM, DMF, and the Department of Transportation (DOT) would enhance and coordinate research, monitoring, permitting and enforcement.

6. Vital fisheries habitats would be considered and protected during the design and siting of agricultural, forestry and other best management practices. Point source dischargers would be located to minimize impacts on vital fisheries habitats.
7. The DCM would consider and address potential cumulative impacts to designated vital fisheries in its Coastal Area Management Act permit review process.
8. The cumulative impacts of fishing, boating and development on vital fisheries habitats would continue to be investigated by DCM, DEM, WRC, DMF, and appropriate federal agencies.
9. DOT would aim to minimize the effects of its construction projects on designated vital fisheries habitats in the design phase.

Evaluation Method

Inventories of designated areas, including acreage and assessments of habitat health, would be necessary to evaluate success of protection measures. Juvenile abundance, shellfish closures, and landings data would aid in habitat protection evaluation.

Costs and Economic Considerations

Delineation and designation of vital fisheries habitats will cost state and federal agencies an estimated \$200,000 per year. This figure is equivalent to four additional staff members and includes the study of cumulative impacts from various sources of disturbance and other research, mapping, and development of specific rules. The main economic impacts of this Management Action will come from any restrictions on the siting or operation of point source pollution generators, from requirements for best management practices in agriculture, forestry and urban development, and from restrictions on fishing practices. Such restrictions or requirements might be recommended in areas likely to impact vital fisheries resources, but any recommendations could only be developed after the study of potential sources of disturbance are completed. In some areas, a large number of restrictions could potentially restrict development, reduce land values, make fishing, farming or forestry more expensive and therefore less profitable, or have other impacts. The potential for these impacts should be fully considered as any new rules are developed and applied. The potential economic costs of vital fisheries habitat protection are offset by many potential environmental and economic benefits. Higher quality fisheries habitats could help generate larger harvests or lower harvest costs over the long run throughout the APES region and perhaps beyond. Recreational

fishing could also benefit to the extent that protection leads to improved fish stocks which may then lead to increased revenues from recreational fishermen. Finally, protected vital fisheries habitats could help provide important habitats for many other plants and animals as well as significant water quality benefits. Increases in environmental quality can also provide incentives that promote natural resource-based tourism. In weighing the costs and benefits, it is critical to consider the cost of delaying improvements to vital fisheries habitat protection. If destroyed, habitats may not be replaceable. Efforts to replace lost habitats in the future may be much more costly than efforts to protect them now. The effectiveness of this strategy depends on the successful implementation of other strategies in the CCMP. To achieve the long-term benefit of an increase in fish and shellfish populations, habitat protection needs to be complemented by strategies that protect from the overharvest of future surplus and protect water quality in general.

Funding Strategy

DMF would apply for funding from the Sport Fish Restoration Fund in order to support habitat mapping. Additional funding may be needed from the General Assembly.

Management Action 3: Enhance existing efforts to restore the functions and values of degraded wetlands and vital fisheries habitats. Develop and begin implementing an expanded program to restore wetlands.

Explanation: Natural areas that have been slightly or moderately damaged may be restored by means such as replanting vegetation, repairing hydrological systems and improving water quality. Expanding restoration will increase the region's acreage of valuable, functioning vital habitats. Research and development of successful restoration techniques will ensure that these efforts are cost-effective.

Critical Steps

1. Mapping data collected through Objective A, Management Action 2 would be used to determine sites for restoration projects. As they are developed, basinwide ecosystem plans would guide restoration toward those areas that are most vital to the watershed or region.
2. Agencies such as the U.S. Fish and Wildlife Service (USFWS), Wildlife Resources Commission (WRC), Division of Forest Resources (DFR), and Division of Environmental Management (DEM), and the Division of Coastal Management (DCM), among others, would seek funds to develop and demonstrate restoration technology. Restoration demonstration projects should emphasize endemic species such as Atlantic white cedar and longleaf pine. For example, the USFWS is now planning to use a two-year EPA 319 Clean Water Fund grant to develop and conduct restoration projects in the Pocosin Lakes National Wildlife Refuge.
3. The National Marine Fisheries Service (NMFS) would evaluate the potential for expanding efforts to restore submerged aquatic vegetation (SAV) beds, taking into consideration whether sources of degradation have been reduced enough to allow for successful restoration.
4. Cooperative efforts to restore impeded migration routes of anadromous fish (particularly American shad, river herring and striped bass) would continue. An APES-funded research project identified certain dams, culverts, stream channelizations and artificial drainages as obstructing the migration of these species. Through a multi-agency effort coordinated by APES with funding from the federal Coastal America program and technical assistance and hydrologic support from the Army Corps of Engineers (USACE), plans have been made to remove two obstructions. USFWS, WRC and DMF would set priorities for future restorations, taking into consideration the amount, quality and potential use of the habitat.
5. Results and data obtained from the Wetlands Enhancement, Restoration and Creation (WERC) Program [currently being developed by DCM and DEM, with funding from the EPA] for restoration feasibility studies and demonstration projects will be used to establish effective wetlands restoration strategies. WERC is being created to develop and implement a comprehensive wetlands restoration plan for the state and to sponsor wetlands restoration research. Under this management action, implementing the WERC program would allow state priorities to

be set for type- and site-specific restoration under existing state regulatory jurisdiction. WERC would direct restoration spending to where it would generate the greatest environmental benefit. DCM has already budgeted \$21,550 for fiscal year 1993-1994 to continue the WERC program. Funding will come from NOAA federal Coastal Zone Management Act Section 309 grants.

Evaluation Method

Restoration goals and priorities would be incorporated into the basinwide ecosystem plans as they are developed. The feasibility and potential effectiveness of restoring submerged aquatic vegetation in the region would be evaluated. The success of these steps also would be evaluated by monitoring the number of landowners participating in habitat restoration or enhancement. Voluntary restoration would be evaluated based on the number of acres, by habitat type, enrolled and successfully restored. An overall evaluation of the effectiveness of these programs in meeting regional goals would be needed.

Costs and Economic Considerations

USFWS would need an additional \$100,000 in order to further develop and demonstrate restoration technology in the APES region. Coordination and planning considered in Objective A would help assure that public funds are used where the benefits of restoration would be greatest. Costs of restoration can vary greatly depending on the type of habitat and restoration needed. For instance, a recent review of representative wetlands restoration projects revealed a range from \$40 per acre for seeding in a bottomland forest to over \$2,500 per acre for restoring a major riparian wetland, including extensive grading, riprap installations and plantings. To evaluate the feasibility of any specific restoration project or program, information would be needed on the effectiveness of different technologies in specific applications, on potential restoration sites and on the question of whether restoration would be successful based on the level of original damage. Because the costs and benefits of restoration vary greatly, the additional expense of careful feasibility studies is justified. Enhancing vital wetlands also can play a critical role in regulating the storage and movement of water in a river basin, and restoring wetlands as part of basinwide water quality initiatives could generate large savings by reducing the costs for flood and wave control structures, stormwater control and treatment, water quality maintenance and vital fisheries habitat protection.

Funding Strategy

USFWS would acquire funding through an expanded budget request to the U.S. Congress and through the creation of partnerships with private industry.

Management Action 4: Establish by 1995 a consistent and effective mitigation program to compensate for unavoidable permitted wetlands losses.

Explanation: Mitigation compensates for the loss of smaller, fragmented wetlands with the acquisition, enhancement or restoration of larger, contiguous wetlands. A practical and coordinated system of mitigating wetlands damage, that is permitted only after all efforts to avoid and minimize alteration of wetlands have been considered, would ensure the greatest possible long-term benefit to vital habitats. Mitigation banking is a mechanism that allows land developers to alter wetlands in exchange for financial contributions toward the acquisition, enhancement, restoration, or creation of wetlands with similar value. This practice would be evaluated for expanded use in the region.

Critical Steps

1. The Division of Environmental Management (DEM), in conjunction with the Division of Coastal Management (DCM), the Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), and other involved agencies would continue to develop effective wetland mitigation procedures. State level research and development of nursery techniques for wetland tree species would be encouraged.

2. New mechanisms that coordinate and consolidate wetlands mitigation efforts would be pursued.
3. DEM would explore the feasibility of a mitigation bank in consultation, as appropriate, with agencies, potential mitigation bank users, wetlands restoration specialists and others. If a bank is determined to be feasible, efficient, and effective, wetlands mitigation banks would be created on a manageable scale to compensate for unavoidable losses of wetlands resulting from economic development projects. If mitigation banks are created, DEM, DCM, USACE, EPA, USFWS and other involved agencies would form an interagency team to evaluate wetlands sites and potential bank sites within each basin. Bank sites would be acquired by public or private means. The interagency team would review all proposed projects with anticipated impacts on identified wetlands for compliance and permit authorization. Mitigation of wetlands sites would be completed prior to commencement of a proposed wetlands-disturbing project. The interagency team would identify and incorporate an evaluation methodology for classifying disrupted and mitigated sites to determine mitigation credits and debits. All involved parties would agree to credit and debit procedures as well as restrictions on use of bank credits.
4. Education and public awareness of new state wetland mitigation procedures would be undertaken by DEM and DCM.

Evaluation Method

Individual projects would be evaluated through site inspections and tracked by the interagency team to insure compliance with the mitigation bank agreement. Basinwide wetlands inventories (Objective A, Management Action 2) would be updated on a regular basis to identify trends in wetland type, extent, and function.

Costs and Economic Considerations

In support of this option approximately \$500,000 would be needed by DEM to establish a coordinated, statewide mitigation program. One third of this amount, \$170,000, would allow the development of a well-managed mitigation program that would coordinate wetland restoration activities associated with both regulatory and non-regulatory programs as well as provide a full accounting of wetlands losses in the APES region. While wetlands regulations can have important economic impacts that should be carefully considered by policy makers, this Management Action does not change current wetlands regulations. It is instead focused on encouraging the most cost-effective use of public and private funds spent on wetlands

mitigation. It would not, in and of itself, change the amount of mitigation that would be required under existing or future regulations. To the extent that consolidation and careful planning of mitigation-driven restoration efforts (such as using some form of mitigation bank) make restoration, management and monitoring more efficient, this Action would yield benefits in the form of more effective public administration and greater water quality from each restoration undertaken. For instance, enhanced water quality supports recreational and commercial activity associated with wetlands, especially recreational fishing and downstream commercial fishing.

Funding Strategy

The development of a mitigation program by DEM would require an expansion budget from the General Assembly. Once established, any mitigation program would be partially funded by entities (public or private) that are required to compensate for the development or alteration of wetlands.