



... the newsletter of the Albemarle-Pamlico Estuarine Study

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Draft Management Plan released for review

At its August 5 meeting, the A/P Study's Policy Committee approved public release of the first draft of the Comprehensive Conservation and Management Plan (CCMP), pending minor revisions.

Public comment on the document will now be sought until early October, at which time the document will be revised in preparation for a second round of public comment. The next several months of the Study, therefore, are the time when public input on and understanding of the Study's goals will be most crucial.

In order to enhance the public's ability to comment on the plan, a variety of forums will be used to present it. Foremost among these will be a series of live call-in talk shows on the "Open/net" cable access network, which reaches most areas of North Carolina. These hour-long shows are scheduled for 8 p.m. each Thursday night during September (3, 10, 17, 24) and will be broadcast statewide. (Contact your local cable company for the specific channel in your area. For satellite reception, use ACS-1, Channel 2.)

The plan will also be presented at several public meetings in the Albemarle-Pamlico region to give the public the opportunity for face-to-face interaction. These meetings are set for the following dates:

September 28	New Bern
7 p.m. Craven County Community College	
September 29	Rocky Mount
7 p.m. N.C. Wesleyan College	
September 30	Elizabeth City
7 p.m. College of the Albemarle	
October 1	Franklin, VA
7 p.m. City Hall	

Although the contents of the plan will be discussed at the beginning of each meeting, persons wishing to have a full copy to review may do so by contacting Joan Giordano (919) 946-6481.

Citizens who would like a synopsis of the plan can review the Executive Summary included on pages 2-4 of this newsletter. On pages 5-6 there is a listing of proposed Management Actions contained within the CCMP.

THE ALBEMARLE-PAMLICO ESTUARINE STUDY

Initiated in 1987, the Albemarle-Pamlico Estuarine Study is a five-year program of research and education on the Albemarle and Pamlico sounds and the rivers that feed them. The Study is charged with developing a Comprehensive Conservation and Management Plan (CCMP) to help guide long-term environmental protection of the estuary. The projected schedule for the drafting, review and publication of the CCMP is as follows:

PROGRAM GOAL	SCHEDULE AS OF SEPTEMBER 1992
First draft of CCMP to committees	Reviewed; comments incorporated in draft
Public review of draft	Ongoing through early October
Public meetings on CCMP draft	September-October 1992
Second draft to committees	October 1992
Second draft to public	November 1992
Second series of public meetings on CCMP	December 1992
Final document to committees	January 1993
CCMP approved and published	February 1993

Coming together is a beginning; keeping together is progress; working together is success.

COMPREHENSIVE CONSERVATION MANAGEMENT PLAN DRAFT EXECUTIVE SUMMARY

In 1986, Congress directed the United States Environmental Protection Agency to conduct an estuary program in the Albemarle and Pamlico (A/P) sounds in North Carolina. It was one of the original estuaries so designated and is currently one of seventeen estuary programs nationwide. The goal of the Albemarle-Pamlico Estuarine Study (APES) is to "provide the scientific knowledge and public awareness needed to make rational management decisions so that the A/P estuarine system can continue to supply citizens with natural resources, recreational opportunities, and aesthetic enjoyment." To meet this goal, the APES management conference and its staff developed the Comprehensive Conservation Management Plan (CCMP). The CCMP is the product of a 5-year consensus building process involving numerous federal, state, and local agencies, organizations, and individuals. The CCMP is a blueprint for maintaining and restoring the biological, physical and chemical integrity of the A/P estuarine system. The CCMP identifies the most pressing environmental problems in the A/P system and establishes goals and objectives for resolving these problems. The CCMP contains recommendations for specific management actions to protect and enhance the estuarine system, its water quality and natural land and water resources, for present and future generations. The management actions are discussed below, and a complete listing of the recommended management actions appears on pages 5-6 of this newsletter.

Human activity within the A/P system is extensive and varied. The Albemarle and Pamlico sounds system represent the region's key economic resource base from commercial fishing, tourism, recreation, and resort development. Economic benefits are also derived from mining, forestry, and agriculture. As human use of the natural resources of the region increases, so too will conflicts among its various users. Significant environmental changes contributing to those conflicts include: declining fisheries, recent outbreaks of fish and crab disease, frequent blooms of nuisance algae, closures of shellfish waters to harvest, losses of historic

shellfish and submerged vegetation beds, and losses of wetland, fish, and other upland habitats.

The Human Environment plan focuses on the efficient management of land and water use change and growth associated with the permanent and seasonal population increases in the A/P region. Thus, the plan recommends that local governments be required to develop land and water use plans which promote natural area preservation and conservation and consider individual and cumulative environmental impacts. The plan also recommends comprehensive state public trust legislation and a state public access plan, complementary to plans currently prepared by local governments, to ensure the maintenance of public trust rights.

The Vital Terrestrial Areas and Wetlands plan addresses the degradation and/or loss of wetlands, rare natural communities, and habitat essential to the survival of rare plant and animal species. This plan recommends coordinated inventory and mapping of all vital terrestrial areas and wetlands to catalog the current extent of these areas and to track changes that occur to them in the future. This plan also recommends increased public education about vital terrestrial areas and wetlands and increased enforcement in some existing regulatory programs. In addition, this plan recommends the expansion of public and private acquisition and incentives for the long term protection of vital terrestrial areas and wetlands. For efficient and predictable management of wetlands-related programs at the state and local level, the plan recommends the adoption of a state wetlands policy, along with a mitigation program to compensate for wetlands damage or loss resulting from permitted activities, and a restoration program to revitalize degraded wetlands.

The Water Quality plan addresses the most pressing water quality concerns in the A/P region including excessive sediment, nutrient, bacterial, and toxicant loadings. The Water Quality plan builds on the foundation of the basinwide

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management strategy initiated by the North Carolina Division of Environmental Management.

Nonpoint sources of pollution are recognized as a major contributor to overall loadings of pollutants to the system, and several recommendations are made to address these sources. The plan recommends additional financial and technical assistance to bolster the existing agriculture and forestry cost-share programs and the on-site sewage program. The development of additional "best management practices" and cost-share programs for control of other nonpoint sources of pollution is also recommended. Requiring the maintenance of a 20-foot buffer strip is recommended along all perennial streams and tidal water bodies. Other measures recommended for nonpoint source control are the expansion of coastal stormwater regulations statewide, the development of coordinated guidelines for the management of marinas, and a requirement for notice of "intent to harvest" for all logging operations.

While more closely regulated, point sources of pollution are also recognized as an important source of loadings of nutrients, biological oxygen demand (BOD), toxicants, and fecal coliform to the A/P system. To prevent adverse impacts from point sources with expected future growth in the region, revision of current policies on available assimilative capacity and secondary treatment are recommended. Expanded use of waste reduction and plant performance analyses are recommended to reduce end-of-pipe concentrations of pollutants. In areas where point sources have caused contamination of the sediments, evaluation of the feasibility of remediation is recommended.

In order to more adequately protect aquatic resources, the Water Quality plan recommends developing or revising several water quality standards and expanding water quality modeling efforts. The expansion of educational initiatives and enforcement efforts, particularly for standards violations resulting from nonpoint sources, is also recommended in the Water Quality plan.

The Fisheries plan makes recommendations to protect fisheries stocks both from high levels of fishing pressure and from water quality and habitat

degradation. Recommendations are made to develop state fishery management plans as a basis for sound management measures to control harvesting pressures and to protect fisheries habitat. To minimize the harvest of non-target organisms, the plan recommends further development and required use of bycatch reduction gear. A cost-share program is recommended to facilitate the implementation of fishing "best management practices," including bycatch reduction. Recommendations are also made for the official designation and protection of vital fisheries habitats including submerged aquatic vegetation, shellfish beds, spawning areas, and additional nursery areas. In an effort to determine the causes of fish and shellfish kills and diseases, the development of a continuous database on the incidence of these occurrences and possible contributing factors is recommended.

Efficient management of the A/P region depends on the participation of an informed and involved population. The Public Education and Involvement plan recommends improvements in the curriculum requirements regarding estuarine issues in primary and secondary schools and expansion of adult education regarding estuarine issues. Such efforts would encourage environmental stewardship and increased public participation in management processes. Public involvement in the APES implementation process would be facilitated by the continuation of the Albemarle-Pamlico Citizens' Advisory Committee and through their representation on the Albemarle-Pamlico Estuarine Council, an implementation coordinating body.

Information management and mapping of the human uses and natural resources of the A/P region is essential to the efficient implementation of the CCMP. APES has developed an information management program at the commencement of the A/P study to support its information management needs. Geographic Information Systems (GIS) technology has been identified as the primary tool for accomplishing information management and implementing land and water use planning. A GIS is comprised of computer hardware and software that is used for compilation, storage, analysis,

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and display of geographic and tabular data. The North Carolina Center for Geographic Information and Analysis (CGIA) administers and operates the information management program, and the continuation of their efforts during the implementation of the CCMP is recommended.

Research needs are discussed in each action plan. Research is recommended only if it is necessary for the successful implementation of specific management recommendations. These needs from the five action plans are compiled in the **Research Plan**.

Monitoring is an essential component of CCMP implementation. Recommendations in the **Monitoring and Assessment Plan** suggest strategies to assess the success of CCMP implementation and the health of the A/P estuarine system. Water quality, fisheries, vital habitat, and the human environment are addressed.

The **Financial Plan** discusses options for financial support of the implementation of the CCMP resource management recommendations. A few of the most legally, politically, and economically feasible options are reviewed in depth. These include local "Environmental Improvement Funds," a saltwater fishing license, a license to sell saltwater fisheries catches, on-site sewage fees, and an urban stormwater utility fee.

In order to implement the management actions mentioned above, the CCMP Implementation Plan discusses the **Albemarle-Pamlico Estuarine Council**. This 22-member council would be comprised of representatives of a diversity of interests and is designed to ensure the long-term coordination of state, federal and local programs, the general public, and other involved parties for the implementation of the CCMP recommendations. The Council membership is recommended to include:

--The Chairman or his/her designee of each of the following:

- Coastal Resources Commission
- Environmental Management Commission
- Forestry Advisory Council
- Marine Fisheries Commission

Soil and Water Conservation Commission
Wildlife Resources Commission

--The Directors of these state divisions:
Division of Coastal Management
Division of Environmental Management
Division of Forest Resources
Division of Marine Fisheries
Division of Soil and Water Conservation
Wildlife Resources Commission staff

--A representative from each of the following federal agencies:

- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- National Oceanic and Atmospheric Admin.

--A representative from the Commonwealth of Virginia

--A representative from municipal government

--A representative from county government

--2 representatives from the Albemarle-Pamlico Citizens' Advisory Committee (1 from the Albemarle area and 1 from the Pamlico area)

--And the Secretary or his/her designee of the Department of Environment, Health, and Natural Resources (Chairman of Council).

The appendix titled "Program Descriptions" contains information on resource management programs which operate within the A/P region. It is useful as background information for the various Action Plans.

The CCMP as a whole represents a model for addressing the problems of and threats to the estuarine system in a comprehensive manner. No single part of the plan can stand alone. Efficient management and protection of the estuarine resources well into the future requires the implementation of the various components of this plan as a single unit.

The CCMP presents information and makes recommendations for action based on information available today. As new information is obtained and analyzed, additional actions or adjustments to the actions recommended in this plan may be necessary to carry out the goals of APES.

Management recommendations form heart of CCMP

There are five major Action Plans in the CCMP, each of which deals with a particular aspect of the general "protect the sounds" goal of the A/P Study. The Management Actions recommended within each Plan are stated below.

HUMAN ENVIRONMENT-POPULATION GROWTH ACTION PLAN

A. Require and fund development of land and water use plans in all counties and municipalities in the Albemarle-Pamlico region.

B. Expand and maintain a central, geographically-referenced database to serve as a basis for local and state planning in the Albemarle-Pamlico region.

C. Develop state comprehensive public trust legislation and a comprehensive state public access plan to recognize and implement public trust rights.

D. Promote cooperative planning efforts among local, regional, state, and federal agencies.

VITAL TERRESTRIAL AREAS AND WETLANDS ACTION PLAN

A. Promote coordinated inventory and mapping of vital terrestrial areas and wetlands.

B. Increase government and nongovernment acquisition of vital terrestrial areas and wetlands while promoting private and public protection incentives and strategies.

C. Include vital terrestrial areas and wetlands preservation, conservation and management in local land and water plans.

D. Develop a statewide comprehensive wetlands protection program for coastal and noncoastal wetlands.

E. Develop a state mitigation program to compensate the loss or degradation of wetlands which result from permitted activities.

F. Develop and implement a state wetlands restoration program to recoup the state's wetland resources and the benefits they provide.

G. Strengthen enforcement of existing management programs.

H. Increase the state's effort in public education on the extent, significance, conservation, and regulation of vital terrestrial areas and wetlands.

WATER QUALITY ACTION PLAN

Planning

A. Expand or refine water quality classifications and criteria where necessary to ensure adequate resource protection for special communities from chronic and

acute toxicity and from general cumulative degradation.

B. More clearly define implementation procedures for the Antidegradation Clause of the State Water Quality Standards.

C. Expand water quality modeling efforts.

Nonpoint Source Pollution Control

D. Expand funding for the existing N.C. Agricultural Cost-Share Program for existing nonpoint sources of pollution.

E. Provide cost-share money to develop and implement new non-agricultural best management practices (BMPs) to control other existing nonpoint sources of pollution.

F. More stringently regulate the installation, inspection, and maintenance of on-site wastewater treatment systems.

G. Require the maintenance of undisturbed (i.e., no ground disturbing activities) 20-foot vegetated buffer strips along all perennial streams, rivers, and tidal water bodies (i.e., the blue line on U.S. Geological Survey topographic maps) as one component of comprehensive water quality management. Further protection or buffering of these water bodies should be encouraged through voluntary programs.

H. Apply the current coastal state stormwater regulations statewide and ensure the proper installation and regular maintenance of all stormwater management systems.

I. Require submittal of a notice of intent to harvest prior to all logging operations -- private and corporate, large and small. Notices of intent should be filed with county foresters and forwarded to the central office of the state Division of Forest Resources for incorporation into one database.

J. Develop coordinated guidelines for the management of marinas.

K. Strengthen the enforcement of nonpoint source violations of water quality standards.

Point Source Pollution Control

L. Strengthen current North Carolina water quality policies on available assimilative capacity and secondary treatment.

M. Increase availability and utilization of waste reduction and plant performance analyses and operator training programs to reduce end-of-pipe concentrations of pollutants.

N. Evaluate for potential remediation areas of sediment proven to be contaminated or toxic.

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Strengthen Existing Water Quality Management Program Efforts

O. Ensure adequate numbers of well-trained staff to implement fully all programmatic goals of education, outreach, and enforcement.

P. Strengthen compliance with Special Orders by Consent by providing financial assistance to facilities as needed.

FISHERIES ACTION PLAN

Controlling Overharvest

A. Develop and implement state fishery management plans with targets for elimination of overfishing for species important to recreational and commercial fishing interests.

B. Control fishing effort where necessary to protect the stocks and the fishermen.

Reducing Bycatch

C. Expand development of bycatch reduction gear and bycatch reducing fishing practices and require their use as their practicality is demonstrated.

D. Develop and implement additional bycatch reduction policies including areal and seasonal restrictions and reduced bycatch allowances.

Protecting Fish Habitat

E. Officially designate for protection native submerged aquatic vegetation (SAV) beds, shellfish beds, spawning areas, and additional nursery areas.

F. Adopt protective regulations and land and water use plans for the protection of these designated vital fish habitats.

G. Expand acquisition of lands and develop incentive programs to encourage private landowners to implement conservation measures on lands associated with designated vital fish habitats.

H. Restore, where feasible, finfish and shellfish vital habitats.

Addressing Fish and Shellfish Kills and Diseases

I. In an effort to determine causal and exacerbating factors, establish a continuous database of information on finfish and shellfish kills and diseases.

Strengthening Fisheries Management Efforts

J. Initiate a long-term, coordinated public education program.

K. Strengthen enforcement, coordination, and implementation of existing management program.

L. Institute cost-share program for a "Best Management Practices" program in commercial fishing.

M. Change the existing marine fisheries license

structure to include a license to sell and a recreational saltwater fishing license.

PUBLIC INVOLVEMENT/EDUCATION PLAN
State-Level Curriculum Development and Planning

A. A rigorous evaluation must be conducted of the North Carolina Department of Public Instruction (DPI) and the North Carolina Department of Environment, Health and Natural Resources' (DEHNR) Office of Environmental Education (OEE) to determine the most effective means of implementing effective environmental science education in all primary and secondary schools in North Carolina.

B. DPI should generate a long-range plan for the creative presentation of (environmental) sciences in primary and secondary schools.

C. DPI should help provide opportunities for continuing education in science for active, certified teachers.

D. DPI should provide a comprehensive list of teaching resources.

E. To ensure for the provision of high quality science programs in primary and secondary schools, DPI should develop specific science coursework requirements for the second two years of undergraduate and the second year of graduate programs in education.

F. DPI and DEHNR's Office of Environmental Education should actively promote partnerships among government, industry and the public.

G. OEE should develop curricular support materials and school outreach programs.

H. Local governments and school districts should provide at least two subject-focused "teacher workdays" per year to promote new ideas, concepts, and methods.

Public Involvement and Adult Education

I. Institutional arrangements should be made to foster public involvement in environmental decision-making processes at the local and state levels.

J. Interaction between the public and elected officials on issues of environmental concern should be promoted through the creation of opportunities for open communication and the dissemination of information designed to increase public involvement.

K. Public awareness about the actions of regulatory commissions (e.g., Marine Fisheries Commission, Environmental Management Commission, Coastal Resources Commission, and Wildlife Resources Commission) should be increased through the public notice process.

L. Provide for active public involvement in environmental research through a well-developed program of volunteer environmental monitoring.



A/P STUDY RESEARCH FOCUS

Projects emphasize management phase

Watershed Planning in the A/P Study Area

Phase 1: Annual Average Nutrient Budgets

Project Leader - Randall C. Dodd, Research Triangle Institute (RTI)



Nutrient overenrichment can cause a number of different though often interrelated problems in waterways, including nuisance algal blooms, increased incidents of low dissolved oxygen, and reductions of water clarity. For all the documented concerns with nutrients (primarily nitrogen and phosphorus, or N and P) in the Albemarle-Pamlico system, however, no basinwide analysis of nutrient sources in the region existed prior to the A/P Study.

This information gap prompted the Study to fund (RTI) to develop a "nutrient budget" depicting the cumulative nutrient loading from various sources. Although producing such a budget for a watershed the size of the A-P necessarily depends more on computer modelling than "real-world" measurements, the models have provided an important early step in developing a nutrient reduction strategy.

RTI examined human sources of nutrients and produced the following estimates of annual loading in the waters of the A-P system (cumulatively estimated to be 35 million kilograms/year N, and 4.3 million kg/yr P):

- | | | |
|---|-------|-------|
| 1) nonpoint runoff
(agriculture, forestry, urban runoff) | 58% N | 44% P |
| 2) point source discharges
(sewage plants, industries) | 8% N | 29% P |
| 3) atmospheric deposition
(rainfall and particulates) | 15% N | 15% P |
| 4) reservoir release
(e.g., Lake Gaston, Falls Lake drawdowns) | 12% N | 5% P |

(Several smaller sources are not explicitly accounted for in the study. Virginia's N and P contributions were figured cumulatively instead of by particular source.)

Agricultural lands are cited in the report as contributing the most nutrients to the overall

system, particularly N. The report notes, however, that the figures for atmospheric deposition reinforce a growing body of evidence that air pollution is playing a significant role in nutrient enrichment.

From a management standpoint, it is impossibly complex to put any firm figure on how much nutrient loading is ecologically acceptable to a body of water, even with the most precise measurement. And when a single management plan must consider dozens of different bodies of water, the situation only gets more difficult to deal with.

It is evident, however, that nutrients need to be controlled more effectively in the A-P system than they are now. This project will help take the process of putting reasonably accurate numbers on nutrient problems an important step further.

Information Management Program

Project Leader - Karen Siderelis, N.C. Center for Geographic Information and Analysis (CGIA)



As future population growth in the watershed of the A-P estuary poses the ongoing threat of increased human impacts on the estuarine system, the need for coordinated geographic information about the region becomes all the more important.

In recognition of this, the A/P Study has provided substantial funding to CGIA for the past five years to help it expand its databases of regional information. These databases are digitized for computer mapping, thus making it possible for local governments to get detailed maps which can greatly facilitate their decision-making processes.

Among the data layers now available from CGIA are: Land use/land cover; soil types; wetlands; point-source discharges; surface water intakes; and Superfund sites.

Planning for future growth is by definition a speculative enterprise. By giving decision-makers a more coherent look at the often confusing matrix of growth impacts, however, CGIA can help make planning a much more precise and effective tool for local governments.

Sound Bites

news, notes and information about the A/P Study



RESEARCH PRESENTED TO LEGISLATORS

On July 1, several displays depicting APES research were set up in the General Assembly Building to acquaint legislators with the progress of the Study. APES-funded research on algal blooms, public attitudes, fisheries gear, and land use mapping were among the topics on display.

As APES moves from study into implementation of management recommendations, legislative support will be vital to funding efforts. Although there has been some contact with legislators during the research-dominated phase, the movement into management is when their involvement becomes paramount.

More than 50 legislators stopped by to discuss issues facing North Carolina's estuaries.

UPCOMING MEETINGS SEPT.-OCT.

Joint Citizen Advisory October 6, Washington
Technical Committee October 8, Raleigh
Annual Meeting October 10, Manteo

Call Joan Giordano, (919) 946-6481, for location and agenda specifics of all APES meetings.

FISH MIGRATION PATHS SELECTED

The A/P Study, in conjunction with several state and federal agencies, has targeted four sites for remediation of barriers to the upstream migration of anadromous fish species. Potential remediation sites have been located on Fishing Creek (in the Tar River basin); the Neuse River near Kinston; the Little River (in the Neuse basin); and on the Nottoway River in Virginia.

Dams, roads, and other structures have greatly reduced the spawning habitat available to striped bass, herring, shad, and other species, that swim from saltwater to freshwater to spawn. The populations of these species have declined sharply in the past two decades, in part because of lost access to spawning areas.

This project is studying the feasibility of removing dams or installing "fish ladders" to reopen miles of spawning habitat. If successful, the renewed access to traditional spawning grounds will help the species regenerate healthy populations.

The four projects under review would open an estimated 125-150 miles of spawning habitat to the migrating fish.

THE ADVOCATE...

is the newsletter of the Albemarle-Pamlico Estuarine Study, a five-year project funded jointly by the US EPA and the State of North Carolina, intended to develop an environmental management plan for the Albemarle-Pamlico estuarine system. The Study, which will conclude in 1992, is part of the EPA's National Estuary Program. It is being conducted within the N.C. Dept. of Environment, Health, and Natural Resources, POB 27687, Raleigh, NC, 27611-7687.

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