Overview of Process

APNEP CCMP Update

APNEP Policy Board Meeting
June 2011
Williamston, NC

EBM Transition Team

Meetings since January 2010 to guide the development of a framework for EBM integration into the 2011 CCMP and monitoring plan.

Team Members: Dr. Jack Thigpen, Dr. Kirk Havens, Marjorie Rayburn, Tom Stroud, Dr. Wilson Laney, Dr. Carl Hershner, Diane Reid, Pete Campbell, Dr. Molly Ruggero,, Jon Blanchard, and APNEP Staff

Feedback from Policy Board, STAC , CAC, EPA, & NCDENR

CCMP

Process Objectives

Develop a CCMP that identifies actions needed to protect and restore Albemarle-Pamlico estuarine system, based on science and with measurable outcomes;

Determine accountability for achieving results including performance, effectiveness, and the efficient use of funds spent on Albemarle-Pamlico estuarine system; and

Promote public engagement, awareness and communication to build support for a long-term strategy and positive environmental change.

CCMP Structure: Proposed Changes

APNEP CCMP Update 2011

The 1994 CCMP included five priority issues (presented as individual plans): Water Quality, Vital Habitats, Fisheries, Stewardship, and Implementation

New plan will be structured around addressing **four questions** regarding the estuarine system in support of **three goals** that will be achieved through implementation actions addressing **five strategies** (Identify, Protect, Restore, Engage, and Monitor).

Four Questions

1: What is a healthy Albemarle-Pamlico Estuarine System?

2: What is the status of Albemarle-Pamlico Estuarine System?

3: What are the biggest threats to Albemarle-Pamlico Estuarine System?

4: What actions should be taken that will move us from where we are today to a healthier Albemarle-Pamlico Sounds by 2020?

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1: What is a healthy Albemarle-Pamlico Estuarine System?

Goal 1: A region where human communities are sustained by a functioning ecosystem

Goal 2: A region where aquatic, wetland, and upland habitats support viable populations of native species

Goal 3: A region where water quantity and quality maintain ecological integrity

Goal 1 Outcomes: Human Communities

Waters are safe for personal contact.

Designated surface and ground water supplies are safe for human consumption.

Surface hydrologic regimes sustain regulated human uses.

Fish and game are safe for human consumption.

Opportunities for recreation and access to public lands and waters are protected and enhanced.

Goal 2 Outcomes: Native Species

The biodiversity, function, and populations of species in aquatic, wetland, and upland communities are protected, restored, or enhanced.

The extent and quality of upland, freshwater, estuarine and near-shore marine habitats fully support biodiversity and ecosystem function.

Non-native invasive species do not significantly impair native species' viability or function, nor impair habitat quality, quantity, and the processes that form and maintain habitats.

Goal 3 Outcomes: Water

Appropriate hydrologic regimes support ecological integrity.

Nutrients and pathogens do not harm species that depend on the waters.

Toxics in waters and sediments do not harm species that depend on the waters.

Sediments do not harm species that depend on the waters.

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Ecosystem Assessment

APNEP has been working to link these goals to specific measures of ecosystem health. The development of a clear set of measurable indicators and benchmarks for the health of Albemarle-Pamlico ecosystem is a new effort that will enable us to assess whether progress is being made, adjust our actions, and report back to the public.

APNEP 2011 Ecosystem Assessment

System-wide Indicators

Climate change

Metrics: storm frequency, storm intensity, air temperature, water temperature (Figurskey - NOAA)
changes in the estuarine and marine shorelines (Mitasova - NCSU and Reide Corbett - ECU)
average salinity across the estuarine system and relative sea level (Dubbs - UNC)
support with average salinity across the estuarine system (Boutin - TNC & Fleckenstein – NCCF)

Air quality

Metrics: total inorganic nitrogen deposition, tropospheric ozone concentration (secondary standard) (Dennis – EPA)

Unusual mortalities/disease

Metrics : instances of mass or unusual deaths of and instances of disease in marine mammals, fishes, birds, and turtles (Laney – FWS)

Economic productivity

Metrics : major yields and monetary value of agricultural, silvicultural, and fisheries products (Keeler – CSI and Dubbs – UNC)

Species diversity

Metrics : extent of areas of high biological diversity (natural heritage index), number of threatened and endangered species (aquatic and terrestrial), number of endemic species (aquatic and terrestrial) (Carpenter)

APNEP 2011 Ecosystem Assessment

Land-based Indicators

Land cover

Metrics: change in the extent of wetlands, urban areas, agricultural land, forests, and silvicultural land; change in the number of CAFO's (Terziotti – USGS and Crawford – ECU)

Population

Metrics: change in human population by county, river basin, and entire AP system (TBD – *?)*

Water-based Indicators

Water quality

Metrics: instances of violations of Clean Water Act 303(d) criteria including chemical and dissolved metal concentrations, bacterial counts, dissolved oxygen, total phosphorus, total nitrogen, chlorophyll *a*, suspended solids and turbidity (Piehler and Dubbs – UNC)

Extent of living habitat

Metrics: submerged aquatic vegetation extent and oyster bed extent (Field & Kenworthy – NOAA)

Fish populations

Metrics: stock statuses of choice species (Carpenter and Laney – FWS)

Riverine Inputs

Metrics: freshwater flow rates, number and type of point source polluters, nutrients, total suspended solids (Spruill – USGS)

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Basic Threat Assessment

Alteration and loss of habitat and the ongoing input of pollution are the top two immediate and pervasive threats facing the Albemarle-Pamlico ecosystem. Habitat alteration has occurred throughout the estuaries, rivers, forests, and shorelines of the rivers and sounds, and thousands of pounds of additional pollution enter the waterways on a daily basis. The entire region faces challenges from a growing human population and a changing climate that will exacerbate the many existing stress and pressures on Albemarle-Pamlico Sounds

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Identify *Protect*

Restore *Engage* *Monitor*

For each strategy there will be description of the current situation and rationale for taking action, key objectives for attaining desired ecosystem outcomes, and near-term actions to move the region forward. The strategic priorities and their associated actions provide a regional starting place.

Identify: Objectives & Actions

Objective A3: Assess natural resource policies and management based on ecosystem-based management principles.

A3.1: Assess the impact of policies and regulations to minimize wetland loss.

A3.2: Assess the impact of policies and regulations of riparian buffer requirements.

A3.3: Evaluate use classifications of waters where implementation of the contaminant management strategy is deemed ineffective by the regulatory authority.

A3.4: Develop and refine ecological flow requirements for each major river.

Identify: Objectives & Actions

Objective A1: Develop and refine a conservation atlas.

A1.1: Facilitate the mapping of significant ecological, bathymetric, geologic, demographic, and cultural features.

A1.2: Facilitate the refinement and use of online conservation planning tools.

Identify: Objectives & Actions

Objective A2: Assess the impacts of targeted threats on the ecosystem.

A2.1: Facilitate the development of placed-based protocols and conduct rapid assessments to determine presence and potential threat of invasive species.

A2.2: Create and improve forecasts of land use and climate change impacts on the regional ecosystem.

A2.3: Support research on adapting to ecosystem impacts associated with climate change and sea level rise.

A2.4: Facilitate a risk assessment of targeted Personal care and Pharmaceutical Products (PCPP) in the estuarine system.

A2.5: Facilitate a risk assessment of heavy metals and other toxic contaminants in freshwater and estuarine sediments.

Protect: Objectives & Actions

Objective B1: Minimize the introduction of additional water pollution sources.

B1.1: Minimize the introduction of targeted sources of toxics.

B1.2: Minimize the introduction of targeted sources of pathogens.

B1.3: Facilitate the protection of natural riparian zones (buffers) to reduce runoff.

B1.4: Facilitate the development of local government policies that support the use of Low Impact Development (LID) practices to reduce runoff.

B1.5: Facilitate the use of best management practices on agricultural and silvicultural lands.

Protect: Objectives & Actions

Objective B2: Protect and manage areas containing significant natural communities and habitats.

B2.1: Facilitate the development of an integrated freshwater habitat protection strategy. This protection strategy will complement the Coastal Habitat Protection Plan (CHPP), serving as a guide for inland waters.

B2.2: Develop and implement a submerged aquatic vegetation (SAV) protection strategy.

B2.3: Facilitate the development of incentives for protection and management of targeted natural communities and habitats.

B2.4: Facilitate the development of policies to minimize dredge and fill activities in naturalized areas and sensitive habitats.

B2.5: Facilitate protection of designated anadromous fish spawning areas and inland primary nursery areas from marina impacts.

B2.6: Minimize and rapidly respond to the introduction of invasive species through the development and implementation of integrated prevention and control strategies.

Protect: Objectives & Actions

Objective B3: Utilize natural and constructed "living" shorelines to maintain estuarine and riverine ecosystem processes.

B3.1: Assist local governments through the development of incentives and regulations for protecting natural shorelines.

B3.2: Develop educational materials to encourage landowners to protect natural shorelines.

B3.3: Develop state regulatory requirements for "living" shoreline stabilization projects that are comparable to those for hardened structures (bulkheads, riprap).

Restore: Objectives & Actions

Objective C1: Restore water quality by eliminating targeted sources of water pollution

C1.1: Establish contaminant management strategies for all waters not meeting standard thresholds.

C1.2: Facilitate the implementation of contaminant management strategies (pathogens, toxics, nutrient) management strategies.

C1.3: Facilitate the restoration of riparian and estuarine shorelines.

C1.4: Reduce unregulated discharge from wastewater treatment systems.

C1.5: Facilitate the voluntary retrofitting of existing public, commercial, and residential development/ infrastructure with Low Impact Development (LID) practices to reduce runoff.

Restore: Objectives & Actions

Objective C2: Restore hydrological processes in rivers and estuaries to significant natural communities and ecosystem functions.

C2.1: Facilitate the development and implementation of coordinated hydrological restoration strategies for large scale restoration projects.

C2.2: Facilitate the development of incentives to replace hardened shorelines with living shorelines.

C2.3: Facilitate the hydrologic restoration of floodplains and streams.

Restore: Objectives & Actions

Objective C3: Facilitate the implementation of collaborative (integrative) restoration programs and projects

C3.1: Develop and refine integrated invasive species eradication and control strategies.

C3.2: Develop and implement a coordinated wetland restoration strategy.

C3.3: Develop and implement a submerged aquatic vegetation (SAV) restoration strategy.

Restore: Objectives & Actions

Objective C4: Remove barriers to passage and restore spawning areas for anadromous fish.

C4.1: Install fish ladders and eel-ways on existing dams and other permanent barriers.

C4.2: Facilitate the removal of dams, culverts, and other in-stream barriers.

C4.3: Restore degraded fish spawning habitats.

C4.4: Facilitate research to improve fish passage.

Restore: Objectives & Actions

Objective C5: Maintain oyster habitat restoration efforts to improve water quality and restore ecosystem function.

C5.1: Build new oyster reef habitats.

C5.2: Reduce the adverse impacts of harvests from existing reefs.

C5.3: Facilitate research to improve oyster restoration technologies and methods.

Engage: Objectives & Actions

Objective D1: Foster environmental stewardship.

D1.1: Communicate the importance of stewardship in the Albemarle-Pamlico region and opportunities for volunteerism to further APNEP's mission.

D1.2: Facilitate efforts to improve public–private partnerships to protect and restore ecosystem processes.

D1.3: Coordinate outreach and engagement efforts regarding the impacts of invasive species.

D1.4: Coordinate outreach efforts regarding the proper application of fertilizers to reduce runoff of nutrients.

Engage: Objectives & Actions

Objective D2: Conduct targeted environmental education efforts regarding sustainable use, habitats, and ecosystem services.

D2.1: Provide and promote opportunities for outdoor experiences that connect individuals with the natural resources of the Albemarle-Pamlico region.

D2.2: Provide environmental education training opportunities for educators in the region.

D2.3: Increase public understanding of water contact, drinking, and fish & game advisories.

Engage: Objectives & Actions

Objective D3: Provide tools and training to support local and regional ecosystem-based management.

D3.1: Develop and implement a strategy to improve government decision-makers' understanding of the costs and benefits of environmental protection, restoration, planning, and monitoring.

D3.2: Facilitate the development and implementation of basinwide water management plans to ensure no less than minimum instream flows are maintained.

D3.3: Facilitate the development of regional and local climate change and sea level rise adaptation plans.

D3.4: Increase opportunities for public access to waterways, public lands, and trails.

Monitor: Objectives & Actions

Objective E1: Develop an integrated monitoring network to collection information to assess ecosystem outcomes associated with the implementation of the CCMP.

E1.1: Facilitate the development of an integrated monitoring strategy and protocols through regional monitoring and assessment teams.

E1.2: Biannually assess the value of information for measuring ecosystem and CCMP implementation outcomes.

Monitor: Objectives & Actions

Objective E2: Develop a comprehensive spatial database (content management system) for pertinent environmental data and modeling information in the Albemarle-Pamlico region.

E2.1: Facilitate the design and content of a regional database based on partners' data and information needs.

E2.2: Develop, implement, and maintain a portal to facilitate use by partners and public.