2021 Report on the 2020 Memorandum of Understanding in Support of Cooperative Conservation and Management of the Albemarle-Pamlico Region

July 2021

In 2020, facilitated by the Albemarle-Pamlico National Estuary Partnership (APNEP), six environmental and natural resources agencies from North Carolina and Virginia signed a Memorandum of Understanding (MOU) that re-affirms their commitment to foster interstate collaboration within the shared waterways of the Albemarle-Pamlico region.

This report is intended to meet the requirement outlined in the MOU to compile the findings and actions resulting from items referenced to the signatories by March 31, 2021, or as soon as possible thereafter.

Key Stakeholders: The signatory agencies include:

North Carolina:
- NC Department of Environmental Quality
- NC Department of Natural and Cultural Resources
- NC Department of Agriculture and Consumer Services
- NC Wildlife Resources Commission

Virginia:
- Secretary of Natural Resources of the Commonwealth of Virginia
- Secretary of Agriculture and Forestry of the Commonwealth of Virginia

The 2020 MOU builds upon a MOU signed in 2017 designed to assist agencies (NC Department of Environmental Quality, NC Department of Natural and Cultural Resources, and Secretary of Natural Resources of the Commonwealth of Virginia, signed November, 2017) in coordinating with APNEP to tackle regional issues such as nonpoint source pollution, restoring fish passage and spawning habitat, and controlling invasive species. The 2020 MOU added additional natural resource agencies including the leads for agriculture and forestry in both states for the first time.

The agencies will continue to work together to explore opportunities to assist state, regional, and local governments in incorporating climate change and sea level rise considerations into their planning processes.

Summary of Activities 2020-2021:

North Carolina and Virginia agreed to the following actions listed in the MOU to continue their collaborative management of the Albemarle-Pamlico Estuary and its tributary system:

1) *Designate and empower leads from contributing agencies and the Director of the Albemarle-Pamlico National Estuary Partnership (APNEP), to pursue the activities described in this MOU;*

- The signatories from each agency designated leads shortly after the MOU was signed in August of 2020.

- Staff from APNEP and the Virginia Department of Conservation and Recreation-Natural Heritage Division (VADCR) were designated to lead coordination and facilitation of MOU implementation with assistance from the Virginia Deputy Secretary of Natural Resources.

- Regular coordination and communication between the state designees and their respective management or Secretaries have assisted in the progress

2) *Maintain regular communication among the agency leads and the APNEP Director;*

- The first meeting with agency designees and APNEP staff was held October 2020.

- The designees have been meeting regularly since then, having held meetings in December 2020, January 2021, and March 2021.

- Coordination has centered around fulfilling the requirements of the MOU, along with substantial progress having been made and consensus support of a Governor level agreement to elevate the status and recognition of the importance of the Albemarle-Pamlico ecosystem both regionally and nationally, discussed further below.

3) *Report on data sharing among Virginia and North Carolina contributing agencies resulting from the 2017 MOU and state if any impediments to additional data sharing opportunities exist. Priority should be given to geographic and hydrologic data pertaining to rare species, natural communities and other conservation values and priorities, as well as threats to ecologically healthy aquatic systems, across state lines for consistent regional research, management, and conservation of shared waterways;*

- Staff developed a matrix summarizing activity that has taken place by agencies and partners in both states, with an emphasis on projects and initiatives that have taken place since the 2017 MOU. Highlighted agency led activities that involve data sharing are included below, with additional information on special projects and initiatives in Section 4 and Appendix A below:

    - Virginia Department of Environmental Quality (VADEQ) shared information about the multiyear partnership with USGS and VA Tech Biological Systems Engineering Department in the development of methodology for evaluating impacts to aquatic life from changes in stream flow.

    - VADEQ has shared withdrawal and discharge information to keep water budgets current in the Roanoke and Chowan Basins.

- The VA Alosa task force managed by the Virginia Department of Wildlife Resources (VADWR) includes representatives from both states and has been active the past few years.

- The Wetland Condition Assessment Tool (WetCAT) project involved the incorporation of wetlands from the shared waterways into an interactive online map, to allow bi-State coordinated assessment, protection, and restoration of wetlands.

- APNEP connected the North Carolina Department of Environmental Quality (NCDEQ) basin planners with VADEQ and the Virginia Natural Heritage Program (VANHP) staff to assist in preparation of the NC Chowan River Basin Plan.

- Progress has been made to assess and characterize the Chowan with the Healthy Waters Program led by VADCR. Staff have been in regular communication with APNEP staff.

- APNEP staff facilitated discussions with the NC Interagency Water Resources Improvement Team, NCDEQ, and VADCR to initiate improvements to data sharing across state lines.

- There are multiple other initiatives and projects described in more detail in the matrix referenced above that have involved data and information sharing across state lines. Not all are agency led but have staff involved in various workgroups and committees.

- Impediments to data sharing include:

    - Computer/Technology/Data Restrictions: North Carolina and Virginia agencies have different state information technology guidelines and restrictions. North Carolina agencies are not advised to use Google and Microsoft Teams is the current preferred platform, whereas Virginia is currently using Google. Establishing a common platform allowed by all of the agencies will be necessary for future implementation efforts.

- Impediments to data sharing can be overcome with regular communication outlined in the MOU, preparation of an annual workplan, and utilizing a file and data sharing platform allowed in both states.

- Staff recommend developing a workgroup to develop priorities for inclusion in an annual workplan to further improve data sharing amongst agencies and across state lines.

4) Assess joint management strategies and activities resulting from the 2017 MOU a) to protect and restore significant resources, b) to improve spawning habitats in shared river basins, c) to

protect areas identified as ecologically healthy, and d) to incorporate resilience to climate change impacts and sea level rise in local, state and regional planning needs;

- The designees from both states recognize that state and regional planning documents have recommended actions that align with this MOU and intend to align any recommended activities to meet shared objectives.

- The designees agreed to focus on climate resilience as a unifying theme for the topics listed above, using the definitions of resilience in the North Carolina Climate Risk Assessment and Resilience Plan and Virginia Coastal Resilience Master Planning Framework as guiding documents.

- **Resilience Definitions:**
  - **NC Climate Risk Assessment and Resilience Plan**
    "A resilient North Carolina is a state where our communities, economies, and ecosystems are better able to rebound, positively adapt to, and thrive amid changing conditions and challenges, including disasters and climate change; to maintain quality of life, healthy growth, and durable systems; and to conserve resources for present and future generations."

  - **VA Coastal Resilience Master Planning Framework**
    "Following the guidance of the U.S. Global Climate Change Research Program, we define resilience as the capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, health, the economy, and the environment. Similarly, we define adaptation as adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects.

- **The North Carolina designees have compiled relevant recommended actions from the plans listed below to use as a framework to identify shared priorities.** Many of these plans include recommendations for multiple agencies that are signatories to this MOU. Details are included in **Appendix A**:

  - NC EO80 Climate Risk and Resiliency Plan

  - NC EO80 Natural and Working Lands Action Plan

  - NCDEQ Chowan River Basin Plan

  - NC Wildlife Action Plan

  - NC Aquatic Nuisance Species Plan: is a comprehensive way for multiple agencies with different missions to work through to find a solution for nuisance species.

  - NC Natural Heritage Biennial Protection Plan

- NC Forest Action Plan
- NC Forest Development Program
- NC Agriculture Cost Share Program: Cover Crops, Conservation Tillage, and Cropland Conversion
- NC Coastal Habitat Protection Plan
- APNEP Comprehensive Conservation and Management Plan

- **The Virginia designees have highlighted the following as potential priorities:**
  - VA Coastal Resilience Master Plan
  - VA Wildlife Action Plan
  - VA Alosa Task Force managed by the VADWR and includes multiple agencies from both states.
  - Cooperative management of Back bay and associated tributaries, including the mapping of SAV and restoration opportunities
  - VADCR and VCUs Development of the Chowan Basin Healthy Waters Conservation Plan
  - VA Bottomlands Hardwoods Initiative
  - VA Forest Action Plan
  - ConserveVirginia - a key tool in guiding land conservation investments, providing a map of Virginia's highest conservation value lands, based on 19 mapped data inputs. The ConserveVirginia map includes more than 6 million acres of lands representing top priority conservation values. The ConserveVirginia tool includes the consideration of Healthy Waters Program resources and data.
  - VADWR's Fish Passage Program is an agency priority. Removing obstacles for migratory fish helps restore historical spawning habitat, restores the rivers to their natural flow regimes, and benefits resident taxa as well. VADWR works with partners, landowners, and local/state/federal agencies to identify and mitigate obstacles to aquatic organism passage, but leveraging interstate resources could have great impacts to downstream resources, especially in the Chowan basin.

- The VADEQ development of over 40 TMDLs and nearly 20 IPs in the Roanoke and Chowan basins

- VADEQ was awarded a grant to support the "Refining Program Capacity to Enhance and Protect Wetland Resources in Virginia" providing additional resources for wetland protection and VIMS and VADEQ were able to add North Carolina wetlands in the Albemarle-Pamlico into an interactive mapping tool called WetCAT (Wetland Condition Assessment Tool).

5) *Recommend whether the preparation of an annual action plan could resolve impediments to collaborative management of the Albemarle-Pamlico Estuary and its tributary system, including the shared Roanoke, Chowan, and the Pasquotank River Basins;*

- The designees agree that an annual action plan would facilitate continued coordination and communication not only between the two states, but also the respective agencies working in the shared waterways to resolve any impediments to collaborative management. This includes to resolve any data management or sharing issues

- Initial discussion has concentrated on the Chowan River Basin as a focus area for the two states, based on progress that has been made on several initiatives, the release of the NC Chowan Basin Plan, and issues with algal blooms in the Chowan River and Albemarle Sound.

  - The NC Chowan Basin Plan, approved March 2021, includes the following as a priority recommendation: Establish better communication between VADEQ, NCDEQ, and the Albemarle-Pamlico National Estuary Partnership to better understand changes that have occurred over time and steps that each state has taken and can continue to take to control nutrients, ensure proportionate nutrient-reduction measures are in place, and improve water quality flowing to the Albemarle Sound.

  - NCDEQ conducted a review of historical and current nutrient conditions including a review of flow-normalized loading trends in the Blackwater and Nottoway Rivers from VA, as well as Potecasi Creek in NC since 1985. As nutrient loadings increase (especially TKN) in the Nottoway, Blackwater, and Potecasi waterways it is important to consider the cumulative impacts of all actives across the basin. Point and nonpoint sources of pollutants jointly share the responsibility to reducing pollution to the states waters in a fair, reasonable, and proportionate manner. More information can be found in Section 5.2, Current Nutrient Conditions and Trends, of the Chowan River Basin plan.

  - Development of the VADCR NHP Healthy Waters Program *Stream Ecological Health Assessment for the Chowan River Basin, Virginia and North Carolina*,

which includes *the Watershed-based Ecological Healthy Conservation Plan for the Raccoon Creek, Nottoway River, Chowan Basin*

- Approved VA TMDLs for the Chowan basin include the following:
    - Hurricane Branch (Sediment), EPA 9/30/2004, SWCD 03/15/2005
    - Roses Creek (E. coli), EPA 07/06/2004, SWCD 12/02/2004
    - Chowan River, Non-tidal (E. coli), EPA 10/14/2005, SWCD 09/27/2006
    - Spring Branch (total Phosphorus), EPA 05/10/2006, SWCD 09/07/2006
    - Albemarle canal, North Landing River (Total Phosphorus), EPA 01/13/2011, SWCD 06/25/2012
    - Flat Rock Creek and Broad Branch (E. coli), EPA 12/29/2008, SWCD 04/28/2009
    - Northwest River Watershed (Total Phosphorus), EPA 04/26/2011, SWCD 06/25/2012
    - Meherrin River and Tributaries (E. coli), EPA 04/12/2010, SWCD 09/30/2010
    - Fontaine Creek (E. coli), EPA 01/13/2011, SWCD 08/04/2011
    - Hatcher Run and UT to Nebletts Mill Run (E. coli), EPA 09/20/2010, SWCD 06/29/2012
    - Assamoosick Swamp and Tributaries (E. coli), EPA 06/03/2011, SWCD 09/30/2010
    - Blackwater River Watershed and Tributaries (E. coli), EPA 07/09/2010, SWCD 09/30/2010
    - Blackwater River Watershed and Tributaries (Dissolved Oxygen), EPA 04/08/2010, SWCD not approved
    - Three Creek, Flat Swamp, Tarrara Creek, Mill Swamp, Darden Mill Swamp (E. coli), EPA 09/28/2012, SWCD 03/25/2013
    - Chowan River Watershed Tidal (E. coli, Entrerococci), EPA 09/27/2005, SWCD 09/27/2006
    - Back Bay, North Landing River and tributaries (E. coli, Total Phosphorus, Enterococci), EPA 06/26/2014, SWCD 12/11/2014
    - Kits Creek Watershed (Sediment, Phosphorus), EPA 08/11/2017, SWCD 07/19/2017

- In North Carolina, there are currently no TMDLs for the Chowan River Basin, but there is a nutrient sensitive waters management strategy which is discussed on page 4 of chapter 5 in the Chowan River Basin Water Resources Plan. The link to the interactive NC TMDL and TMDL Alternative Watershed map can be found here: NC TMDL and TMDL Alternative Watersheds (arcgis.com).

- Progress is being made on several initiatives that cover the entire region, or on particular initiatives or projects in other basins. The designees recognize this

and recommend continued progress and efforts in these areas. Examples include:

- Monitoring of water quality, SAV, and wetlands
- State wildlife and forest actions plans
- Alosa Task Force
- Fish / aquatic organism passage / removal of obstacles and barriers
- Wetlands Condition Assessment (WetCAT)
- NC Aquatic Nuisance Species plan
- Cooperative management, restoration, and collaboration in Back Bay, Currituck Sound, and associated tributaries.
- APNEP Tribal Coastal Resilience Connections project includes coordination with Tribes in Virginia and North Carolina.

6) *Provide a report compiling the findings and actions resulting from the above referenced items to the signatories by March 31, 2021, or as soon as possible thereafter; and,*

- This report satisfies this requirement.

7) No later than December 31, 2020, a recommendation to the signatories of any joint actions by the State of North Carolina, the Commonwealth of Virginia, and the U.S. Environmental Protection Agency needed to fully realize the protection and restoration of water and ecosystem resources throughout the Albemarle-Pamlico Estuary and its tributary system, including the Roanoke, Chowan, and the Pasquotank River Basins, through articulation of the high-level commitment to the region.

- The Albemarle-Pamlico comprises North America's largest semi-lagoonal estuary, and is the 2nd largest estuarine system in the country. It supports an array of ecological, economic, recreational, and aesthetic functions that are of regional and national importance. However, it has not garnered the attention, legislative support, and financial resources that other iconic estuarine systems have around the country, including Chesapeake Bay, Long Island Sound, and Puget Sound. Nor has it obtained the designation as a "large aquatic ecosystem" by the EPA.
    - The designees identified the need to develop a Memorandum of Agreement between the Governors of Virginia and North Carolina and with the US EPA Administrator to collaborate in the shared waterways of the Albemarle-Pamlico estuarine system, with the intent to have the EPA Administrator sign as well.
    - It is intended that a Governor's agreement will assist in elevating the status and importance of the shared waterways of the Albemarle-Pamlico system in both states.
    - Language was drafted in fall 2020 and consensus reached on circulating the draft MOA in early 2021, to be signed by Governor Cooper, Governor Northam, and EPA Administrator Regan.

- The draft is currently circulating amongst the respective agencies for review and approval.

Appendix A: MOU Potential Focus Areas and Alignment with Recommended Actions from Relevant State and Regional Plans

Focus Areas / Unifying Themes:

- **NC Designees propose initially focusing on the Chowan River Basin**
- Interagency / Interstate data sharing, basin planning, communication on all topics
    - Resilience / Climate
    - Ecosystem
        - Working lands
        - Conservation Lands
        - Coastal Habitat
        - Anadromous Fish Habitat
        - Aquatic habitat connectivity (Barrier removal)
        - Species of greatest conservation need (proactive investment to prevent federal listing)
        - Invasive species prevention and management
        - Natural Heritage Areas
        - Aquatic resources identified as ecologically healthy
    - Human Communities
        - Economic
        - Stormwater management
        - Wastewater management
        - Diversity, Equity, Inclusion and Justice
        - Capacity building in rural / local areas
    - Water
        - Flooding
        - Inundation
        - Quality
        - Hydrologic restoration (wetlands, floodplains, stormwater)
        - Ecological Flows

APNEP Comprehensive Conservation and Management Plan (CCMP) & NCDEQ Initiatives

- NCDWR Interagency Watershed Restoration Improvement Team (WRIT) coordination
- Aligns with Leadership Council focus areas, current initiatives, and multiple CCMP actions:
- Water Quality: Chowan algal blooms/ Nutrient Criteria Development Albemarle Sound, UNC-IMS sampling project
- SAV protection and monitoring in low salinity waters OBJ OBJ
- Coastal plain ecological flow development
- Tribal engagement & coordination
- APNEP annual GPRA reporting to EPA on habitat protection and restoration
- North Carolina Coastal Habitat Protection Plan
    - Infrastructure: Inflow & Infiltration improvements
    - SAV
    - Water Quality

Actions and Recommendations extracted from North Carolina agency plans:

NC EO80 Natural and Working Lands Action Plan (page 17 Chapter

Table 3-1: Summary Table of Priority Recommendations (relevant actions)

Transformative

1. Protect and restore forests and wetlands within flood prone areas.
3. Build a multi-state NWL solutions toolbox.

Protect Forest Lands

5. Conserve forest lands through easements and acquisition.

Restore Forest Land

7. Expand restoration efforts on publicly owned lands.

Protect and Restore Floodplains and Wetlands

Restore Pocosins

12. Rewet hydrologically altered peatlands to prevent soil loss and catastrophic fire.
13. Reforest peatlands with Atlantic White Cedar.

Enhance Pocosins

14. Enhance soil health and retention on working peatlands via best management practices and drainage management.

Protect Coastal Habitats

17. Facilitate migration of coastal habitats through protection of migration corridors.

Protect and Restore Urban Lands

20. Protect and restore forested lands in water supply watersheds.

Enhance Agriculture

23. Encourage adoption of high mitigation agricultural conservation practices on croplands and pasturelands.

NCDEQ: **Chowan River Water Resources Basin Plan (2021)**

- Nonpoint source pollution is the primary threat to water quality and habitat degradation in the Chowan River basin. Recommendations below have been extracted from the Chowan basin plan, including those in bold type that have been identified as priorities by the NC DEQ and DWR Basin Planning Branch.

- **Establish better communication between VADEQ, NCDEQ, and the Albemarle-Pamlico National Estuary Partnership to better understand changes that have occurred over time and steps that each state has taken and can continue to take to control nutrients, ensure proportionate nutrient-reduction measures are in place, and improve water quality flowing to the Albemarle Sound.**
    - Conversations should include how to improve, manage, and share water quality data across the basin and how to capture BMP benefits (agriculture, stormwater, etc.).
    - This information could then be used to model nutrient loads throughout the entire basin.

- The Basin Planning Branch in the Chowan River basin should work with the Nonpoint Source Planning Branch, Soil and Water Conservation Districts, Natural Resources Conservation Service and whoever else they can to improve our understanding of point and

nonpoint sources and encourage continued efforts to implement restoration and best management practices to reduce nutrients, sediment loads and flow volume to the receiving streams of these watersheds.

State and local agencies, as well as individual cooperators and landowners, should invest in nutrient reducing activities including:

- Promote BMPs in the region and work with landowners on new and innovative practices that can reduce nutrients, manage water levels in the field, and explore the benefits of forested buffers and wetlands to reduce nutrients and mitigate flood damage.
- Promote BMPs to reduce the loading of phosphorus into the whole Chowan River system, with a focus on reducing phosphorus bound to sediments that can increase instream total phosphorus concentrations during runoff events.
- Encourage the use of nutrient management plans to ensure efficient use of fertilizers.
- Provide sufficient funding for adequate technical assistance and voluntary implementation of BMPs through the state's existing cost share programs managed by the Division of Soil and Water Conservation as well as federal cost share programs and/or grants.
- Discuss riparian buffer incentives for landowners wanting to harvest timber adjacent to known nutrient-sensitive waters. Working collaboratively with landowners, state and federal agencies, and researchers, NC Forest Service continues to explore how forest management may influence water quality in the Albemarle region.

NCWRC Wildlife Action Plan

- Need to balance resilience measures with land management priorities
- Management practices that reduce impacts and work synergistically with other conservation actions are needed to enhance the resilience of natural resources. Particular needs include preserving biodiversity, protecting native populations and their habitats, and improving degraded habitats.

4.2.14 Estuarine Aquatic Communities:

- Consider closing fisheries for declining species during the spawning season.
- Consider establishing marine reserves to provide refuge from fishing pressure, facilitate adult migration patterns and larval dispersal pathways, and support fisheries restoration efforts.
- Protect conservation corridors that run from shorelines inland to facilitate habitat migration.
- Establish marsh habitats in cleared areas that are likely to become wetlands in the future due to inundation or frequent flooding.

4.3.2 Estuarine Wetland Communities:

- Long-term monitoring is critical to assessing species and ecosystem health and gauging the resilience of organisms to a changing climate. These efforts will inform future decisions on how to manage species and their habitats. Collect spatial information on the distribution of estuarine habitats, document their characteristics, such as salinity, water levels, plant community structure and density, and monitor marsh die-back events.

- Because dramatic movement of these communities is probably inevitable as sea level rises, one of the most important things that can be done to help them adapt is to protect areas where they can migrate.
- Protection of low-lying shoreline areas that would allow for inland migration is difficult but would provide important benefits.
- Where practical, restore marsh habitat by filling drainage ditches and installing ditch plugs and water control structures. Ditches may accelerate erosion and the effects of rising sea level such as saltwater intrusion.
- Protect riparian buffers and floodplains, as this will benefit estuaries by reducing pollutant input and reducing drastic changes in freshwater input.
- Focus on land acquisition and protection for a number of heronries (e.g., Rawls Island) on the mainland side of Pamlico Sound where brackish marshes are in private ownership. Acquisition targets should include brackish marsh impoundments, which will then require continued management for maintenance.
- Protect habitats in large enough patches to sustain priority species, reconnect fragmented habitats, restore habitats that have been lost or converted, enhance the function and structure of habitats that have been degraded, and manage habitats for priority species.

4.5 River Basins: The Chowan, Neuse, Pasquotank, Roanoke, and Tar-Pamlico river basins drain to the Albemarle-Pamlico estuary system.

- Conduct long-term monitoring to assess performance of specific conservation actions: stream restoration projects; species restoration projects; improvements in flow regions below dams; improvements in best management practices (BMPs).
- Support county soil and water conservation measures such as BMP recommendations to address sediment and erosion related to agricultural activities.
- Work with and promote existing programs that help farmers reduce sedimentation/ erosion (installing fences to keep livestock out of streams, improving tilling practices) as well as reduce pesticide and herbicide use.
- Promote use of best management practices (BMPs) and efforts toward improvements to animal waste treatment technology.
- Support incentive and information programs that help reduce sedimentation and erosion (e.g., fencing livestock from streams, improve tilling practices), minimize pesticide and herbicide use, modernize wastewater treatment facilities, and so forth.
- Develop and support programs that provide technical guidance and assistance to property owners and businesses on how they can reduce impacts and achieve conservation goals.
- Support the development and application of an aquatic nuisance species management plan with other agencies/groups.
- In the Chowan River basin, support restoration projects that restore creek habitat and fisheries along with water quality.
- In the Neuse River basin, support stormwater management and wastewater treatment plant improvements and upgrades.

- In the Pasquotank River basin, wetland and marsh restoration projects and shoreline stabilization are high priorities for areas prone to erosion from natural exposure or from heavy boat traffic.

NCDACS / SWCD Priorities in Chowan Basin

- Inland flooding {resilience measures to mitigate: buffers, land protection, etc. see above per NWL}
- Forestry / BMPs / buffers /
- Ag cost share programs

NC Aquatic Nuisance Species (ANS) Plan (all agencies)

1. Increase the coordination of aquatic nuisance species prevention and management activities.
2. Educate public and private stakeholders on the impacts of aquatic nuisance species.
3. Identify and secure new funding for aquatic nuisance species activities.
4. Monitor occurrence and spread of aquatic nuisance species.
5. Manage populations of aquatic nuisance species and manage other aquatic invasive species as appropriate to prevent their establishment and spread.

<u>Actions and Recommendations extracted from Virginia agency plans:</u>

VA Coastal Master Resilience Plan

- EO24, Section 2, A.5. calls for the creation of a VA Coastal Master Resilience Plan that will: Employ natural and nature-based solutions to the maximum extent possible and provide guidance for land conservation efforts by identifying land providing resilience benefits along with other ecological services.

Virginia Healthy Waters in the Chowan Recommendations

- **Create, maintain or expand riparian buffers:** to achieve protection of steam corridors to maintain and ensure aquatic and terrestrial communities, we recommend forested riparian buffers along the river and any streams on the property. These buffers should be at least 100 feet wide on both sides of the waterways. If slopes are 11-25 % the buffers should be 150 feet wide and if slopes are greater than 25% buffers should be at least 200 feet wide. These buffers should be kept free of livestock and soil disturbances. Timber harvesting of 50% cover of the landward 50 feet these buffers may be acceptable
- **Protect Headwaters streams:** Often intermittent, and therefore not recognized as a "blue line stream" and underserved by regulation, these streams are extremely important to the natural function of downstream waters and habitat for aquatic communities. Exclusion such as fencing livestock out of these areas can prevent downstream degradation of high quality perennial streams
- **Maintain natural stream flow to ensure aquatic habitat is consistent with ecologically healthy ecosystems:** The natural, seasonal pattern of stream flow, the stream's response to storm events, and maintaining minimum flow levels may be as critical to a stream's health as water quality

- **Protect natural stream channels:** By protecting riparian corridors, through easements or by excluding livestock from unlimited access to stream channels, direct introduction of some pollution (bacteria) may be minimized as well as reducing the direct impacts to aquatic habitat and the creation of erosion problems.
- **Apply the *Criteria for Ecologically Healthy Watershed Conservation* as a compliment to the USEPA Nine Key Elements of Watershed Planning:**
    - Identify and quantify causes and sources of impairments
    - Estimate expected load reductions
    - Identify BMPs and critical areas to achieve load reductions
    - Estimate needed technical and financial resources
    - Provide information, education and public participation component
    - Include schedule for implementing NPS management measures
    - Identify interim measurable milestones for implementation
    - Establish criteria to determine if load reductions are achieved
    - Provide a monitoring component to evaluate effectiveness

Virginia Wildlife Action Plan

- The Action Plan identifies 883 species that are either critically imperiled or in decline. Habitat loss is the single greatest challenge impacting these species. The Action Plan identifies strategies to conserve and restore these species. In addition to a statewide overview, the Action Plan describes strategies for 21 multi-county planning regions which are roughly consistent with Virginia's Planning District Commissions. For each planning region, the Action Plan identifies the local wildlife priorities, the habitats those species rely upon, threats impacting these species and habitats, and conservation actions that can be taken to address those threats. The Action Plan identifies: priority places for either conservation or restoration within each planning region, programs working to address threats or define best management practices, and data that could be used to document and evaluate the success of conservation actions. Finally, the updated Action Plan describes climate trends that have been projected for Virginia and identifies actions that can be taken to conserve wildlife under changing climatic conditions.

Virginia Alosa Task Force

- **Provides a unified voice and facilitates collaborations to promote the monitoring and restoration of Alosine species in Virginia waters and elsewhere.**
    - Provide advice and recommendations on Alosine Management
    - Facilitate communication/collaboration
    - Evaluate past work to identify success/failure to inform group going forward
    - Identify and work to remedy data gaps
    - Serve as a vehicle for resource sharing
    - Identify future projects helpful to Alosine restoration
    - Host workshops to share valuable techniques and information
    - Foster the exchange of mutually useful data
    - Meet bi-annually to coordinate and share information

Virginia Forest Action Plan

- Virginia's 2020 forest action plan identifies the trends, threats, and opportunities within the Commonwealth's forestland over the next 10 years. These are summarized into nine

issues, that are geographically prioritized, that are most likely to affect the health, composition, and extent of forests. Strategic actions are given to protect, conserve, and enhance forestland across the state.

- Virginia's forests are faced with the threat of fragmentation and conversion as growing populations and changing ownerships puts higher values on intensive land uses. But trees are the answer to many of the environmental issues facing Virginia, so continued scientific forest management and a healthy forest industry are necessary to continue to provide real value to landowners. Virginia's nine priority issues are:

A. Protect Forests from threats

1. Protect forestland and associated woodland home communities from fire
2. Protect forests from forest health threats and invasive species
3. Conserve and restore diminished species

B. Enhance public benefits from trees and forests

1. Enhance the role of forests in maintaining water quantity and quality
2. Support the forest economy and diversified markets for forest landowners
3. Expand and improve urban and community forests

C. Conserve and manage working forest landscapes for multiple values and uses

1. Keep forests as forest
2. Promote a larger, connected forest landscape
3. Ensure the sustainable use of forest resources