



NATIONAL *fish, wildlife & plants*
CLIMATE ADAPTATION STRATEGY

Project Title: “Peatland Rewetting and Restoration to Build Resiliency and Sequester Carbon at Pocosin Lakes National Wildlife Refuge (NWR)”

Headline Title (2-5 words): Pocosin Lakes NWR Peatland Restoration

Brief Summary (Abstract): FWS is collaborating with an array of stakeholders to increase the resiliency of peatlands through restoring the hydrology of these carbon-rich wetlands. Refuge lands at Pocosin Lakes National Wildlife Refuge (NWR) are ecologically degraded due to prior drainage which promoted soil loss to the atmosphere via oxidation. Healthy pocosins require periodic fire, but lowered water tables render peatlands vulnerable to more frequent and severe fires. During such fires, losses of up to five feet of peat deposits have occurred at once, resulting in abrupt habitat changes, massive carbon releases to the atmosphere, significant impacts to air quality and public health, vulnerability to sea-level rise, and massive financial costs for suppression. In low elevation peatlands, the extensive network of ditches also allow the wind-tide-driven systems to jet brackish water much further into the interior resulting in accelerated shoreline erosion and peat decay. Restoration is achieved by installing water control infrastructure (including risers and berms) to raise the water table, attenuate run-off, and encourage a more natural sheet flow (rather than channelized flow through artificial ditches).

Project Location: Pocosin Lakes NWR (Hyde, Tyrrell, and Washington Counties, NC)

Partners: The Nature Conservancy, North Carolina Department of Environment and Natural Resources, Duke University, TerraCarbon, Conservation Fund, USGS.

Background: Historic ditching and draining of pocosin wetlands on the Albemarle-Pamlico peninsula has impaired the wetlands’ natural roles such as providing wildlife habitat, protecting estuarine water quality, limiting the potential for catastrophic wildfires and associated soil elevation loss, and abating the impact of floods, storm events, and sea-level rise. In the short-term, this project will restore the natural hydrology of wetlands, thus reducing the erosion of peat soils and improving estuarine habitat. In the long-term, the project will reduce the risk of intense wildfires and will improve the peninsula’s resiliency to imminent sea level rise and storm or flood events by restoring wetland function while preventing soil loss and promoting soil formation.

Project Goals: Repair existing water-control infrastructure to restore former hydrologic conditions on 23,500 acres of refuge lands for the benefit of habitats, wildlife, and local communities.

Strategy Goals Implemented:

Climate Impacts Addressed: Peatland forests are gaining global recognition for their tremendous carbon sequestration potential. This resiliency project will result in immediate carbon sequestration benefits and we estimate the project will sequester 1,080 metric tons of CO₂ equivalents per acre per year out to year 100. The actual carbon benefits will continue to accrue for a period equal to the time required for total peat loss absent restoration (or up to 500 years based on peat depth). FWS has partnered with



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Duke University Wetland Center to verify the carbon benefits of pocosin restoration estimated through our calculations (http://www.fws.gov/raleigh/pdfs/PeatlandRestoration_CSeqBenefits_Jan2010.pdf). Resiliency projects similar to the one proposed here may be an attractive source of carbon and nitrogen credits and could facilitate new partnerships in the future based on low implementation costs and substantial benefits relative to others credited in carbon markets. With nearly a half million acres of restorable peatlands in the Albemarle Sound region of North Carolina (and 100,000 acres on FWS lands alone), refuges can substantially contribute to international targets for carbon sequestration through rewetting efforts, which will also restore significant wildlife habitats. Restoring the hydrology is also a fundamental climate change adaptation strategy as it allows the soil to re-accumulate by preventing incremental (via oxidation) and catastrophic (via burning) soil loss, limits saltwater intrusion to maintain necessary soil moisture and promote carbon sequestration benefits, and helps mitigate impacts of flooding and storm events.

Status of Project Implementation (Timeline, Milestones, Next Steps): The total acreage of the restoration footprint at Pocosin Lakes NWR is 36,660 acres, of which 20,395 acres has already been restored through partnership efforts. Of the remaining 16,265 acres targeted for restoration, the most pressing need under our climate adaptation strategy is to restore 1,325 acres by installing 1) a three mile berm and 2) three water control structures with risers at strategic elevations to provide adaptive management of water levels that vary seasonally or with climatic changes.

Project Outcomes: The immediate ecological outcomes of this restoration work would be a reduction in peat soil loss, an increase in habitat for fish and shellfish, and improved water quality in the estuary due to a reduction in nutrient and sediment runoff. In the long term, the restored hydrology would lead to improved resiliency of the ecosystem to sea-level rise and storm events and less intense and widespread wildfires. The long-socioeconomic benefits to the human communities due to the hydrologic restoration would be an abatement of catastrophic storm and fire events and an improvement in the natural resources on public lands and waters that sustain valuable tourism and recreation opportunities which are an important component of the local economy. Short term success criteria include a raised water table, enhanced soil moisture content, sufficient capability and water levels to mimic natural seasonal hydrology conditions, and reduced greenhouse gas emissions.

Funding Sources: TNC donor funds, USFWS, and supplemental need (~260K current projection).

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