



THE IMPORTANCE OF POCOSIN LAKES RESTORATION

The US Fish and Wildlife Service **Pocosin Lakes National Wildlife Refuge** was established in 1990 to conserve unique pocosin wetland habitats in eastern North Carolina.¹

- The refuge spans **110,106 acres** in the Albemarle-Pamlico region in Hyde, Tyrell, and Washington counties.²
- **Habitats:** pocosins (60%), bay forests, Atlantic white cedar forests, hardwood swamp forests, cypress/gum swamps, freshwater marshes, cropland, and more.³
- **Wildlife:** resident and migratory species, including black bears, red wolves, waterfowl, shorebirds, wading birds, and neotropical migratory songbirds, making it a key location on the Atlantic Flyway.³

Pocosins are dense, shrub-covered wetlands with nutrient-poor deep peat layers. Healthy pocosins provide important **ecological benefits** including:

- **Storing carbon** in peat soils, helping mitigate **climate change**.⁴
- Offering a habitat for **migratory birds** and other wildlife.⁵
- Retaining and slowly releasing rainwater, thereby improving **water quality**.⁴

By 1990, when the Pocosin Wildlife Refuge was established, nearly **40% of its pocosins** were altered due to historic ditching and draining from agriculture⁶, causing:

- The loss of wildlife habitat, pocosin vegetation, and wetland

function including **reduced carbon sequestration**.⁷

• Dried-out and highly combustible peat soils that posed a **wildfire risk**.⁴ **Catastrophic wildfires** followed from 2008 to 2011, four wildfires burned 94,000 acres and released **20 million metric tons** of carbon into the atmosphere.^{4,8,9}

• Wildfire impacts include habitat destruction, carbon emissions, and smoke-related human health issues.⁷

Restoration efforts to restore wetland function and reduce fire risks started when the U.S. Department of Agriculture designed the pocosin restoration process in 1994.⁶

• The Pocosin Lakes NWR restoration project, managed by the Wildlife Resources Commission, The Nature Conservancy, and partners, aims to restore wetland hydrology by raising the water table.⁶

- By **2020, 37,000 acres** (about 33% of the refuge) were restored, resulting in the estimated sequestration of over 194,000 metric tons of carbon annually.⁶

Restoration benefits include improved carbon and nitrogen sequestration, wildlife habitat restoration, better water quality protection, climate change adaptation, less fire risk, and improved flood protection for downstream properties.⁴

- Water control weirs were installed in the ditches to achieve an average water table depth of approximately 10 cm below the soil surface, which was determined to be the optimal depth for balancing carbon dioxide and methane emissions.¹⁰
- The weir network is also designed to detain large rainfall events, reducing flood risk on downstream properties.¹⁰



Photo Courtesy of ncwetlands.org



Photo Courtesy of ncwetlands.org

References

- 1 U.S. Fish and Wildlife Service, 2019. Pocosin Lakes National Wildlife Refuge, North Carolina – About the Refuge. Retrieved from: https://www.fws.gov/refuge/Pocosin_Lakes/
- 2 North Carolina Wildlife Resource Commission, 2018. Pocosin Lakes NWR: The Hidden Gem of the Inner Banks: Retrieved from <https://www.ncwildlife.org/News/Blog/pocosin-lakes-nwr-the-hidden-gem-of-the-inner-banks-1>
- 3 U.S. Fish and Wildlife Service, 2014a. Pocosin Lakes, Habitat Types. Retrieved from https://www.fws.gov/refuge/pocosin_lakes/wildlife_and_habitat/habitat_types.html
- 4 U.S. Fish and Wildlife Service, 2014b. Carbon Sequestration Benefits of Peatland Restoration in the Albemarle Pamlico Region: A Large scale Cooperative Restoration Project to Meet the Challenge of a Changing Climate, presentation retrieved from: https://estuaries.org/download/summit/2014/tuesday_proceedings/session_v/Schmerfeld_2014_Summit.pdf
- 5 U.S. Fish and Wildlife Service, 2014c. Pocosin Lakes, Wildlife General Information. Retrieved from https://www.fws.gov/refuge/pocosin_lakes/wildlife_and_habitat/wildlife_general.html.
- 6 U.S. Fish and Wildlife Service, 2020. Pocosin Lakes National Wildlife Refuge, Draft Water Management Plan and Environmental Assessment. Retrieved from <https://ecos.fws.gov/ServCat/DownloadFile/171818>
- 7 U.S. Fish and Wildlife Service, 2016. Pocosin Lakes National Wildlife Refuge, North Carolina- Pocosin Lakes Hydrology Restoration. Retrieved from: https://www.fws.gov/refuge/pocosin_lakes/what_we_do/PL_hydrology_restoration.html
- 8 U.S. Fish and Wildlife Service, 2009a. Benefits of Wetland Hydrology Restoration in Historically Ditched and Drained Peatlands: Carbon Sequestration Implications of the Pocosin Lakes National Wildlife Refuge Cooperative Restoration Project. Retrieved from https://www.fws.gov/raleigh/pdfs/PeatlandRestoration_CSeqBenefits_31709Final.pdf
- 9 U.S. Fish and Wildlife Service, 2009b. Fire Management, Largest Fire of 2008 Declared out. Retrieved from https://www.fws.gov/fire/news/nc/evans_road.shtml
- 10 Richardson, Curtis J., Flanagan, Neal E, and Ho, Mengchi. 2023. The Effects of Hydrologic Restoration on Carbon Budgets and GHG Fluxes in Southeastern U.S. Coastal Shrub Bogs. Ecological Engineering, DOI: 10.1016/j.ecoleng.2023.107011