NAWPA Committee

The North American Intergovernmental Committee on Cooperation for Wilderness and Protected Area Conservation
El Comité Intergubernamental de Norteamérica de Cooperación para la Conservación de las Áreas Protegidas y Silvestres
Comité Intergouvernemental NordAméricain pour la Coopération Sur la Conservation des Milieux Sauvages et des Aires Protégées

NAWPA COMMITTEE
CLIMATE CHANGE WORKING GROUP

CASE STUDY OF CLIMATE CHANGE IMPACTS AND SOLUTIONS

U.S. FISH & WILDLIFE SERVICE:

ALLIGATOR RIVER, GREAT DISMAL SWAMP, AND POCOSIN LAKES NATIONAL WILDLIFE REFUGES

Peatland drainage promotes catastrophic fires and soil loss (A) and accelerated shoreline erosion and peat decay (B). Rewetting mitigates impacts (C).

KEY MESSAGE

FWS and partners are increasing the resiliency of Refuge peatlands by restoring the hydrology of these carbon-rich wetlands. With nearly 0.5 million restorable acres in the Albemarle Region of NC/VA (and 1/5 on FWS lands), refuges can substantially contribute to international targets for carbon sequestration through rewetting efforts while conserving significant wildlife habitats.

IMPLICATIONS FOR PROTECTED AREA MANAGERS RESULTING FROM HISTORIC PEAT WETLAND DRAINAGE

- Lowered water tables cause soil oxidation and associated carbon loss of 10.8 t CO_2-e/ac. On Refuges, 100,000 acres with rewetting need results in release of 1.1 million t CO_2-e to the atmosphere annually.
- Drainage renders peatlands vulnerable to more frequent and severe fires. Losses of up to five feet of peat have caused abrupt habitat changes, massive carbon releases, impacts to air quality and public health, and massive financial costs for suppression.
- In this sea level rise vulnerable area, incremental (via oxidation) and catastrophic (via burning) soil loss results in diminished land elevation and accelerated shoreline habitat inundation.
- Drainage ditches provide conduit for wind-driven tides and storm surges to deliver brackish water to interior peat deposits resulting in accelerated shoreline erosion and peat decay.
- Ditches cause water quality impacts via enhanced transport of soils and their constituents (e.g., nutrients, carbon, mercury) to downstream waters and significant aquatic habitats.

- Peatland drainage causes terrestrial habitat shifts. In particular, globally-threatened Atlantic white cedar and the critically endangered pond pine canebreak rely on intact peat wetlands.
- Human community impacts include health effects of smoke from long-duration peat fires, the deterrent of smoke on tourism (and associated revenue) in nearby beach communities, and the loss of peat wetland buffering capacity for storm surge protection.

CRITICAL STRATEGIES AND ACTIONS TO MITIGATE OR ADAPT TO IMPACTS

- Peatland rewetting via hydrology restoration generates resilience to climate change (sequesters carbon, expands shoreline defense along "front line" communities while slowing loss, and promotes soil accretion in SLR vulnerable areas)
- Strategy to engage carbon markets re. peatland rewetting and methods to verify restoration carbon benefits and to attract new carbon-based partners and funding to expand restoration.
- Strategic acquisition and restoration of higher elevation peatlands to connect existing conservation lands and provide corridors for wildlife emigration from front line habitats as they are inundated.