ADIRONDACK
BOREAL WETLANDS

FACTS:

Wetlands make up nearly a million acres of the Adirondack landscape. More than 600,000 acres consist of characteristically northern wetland types including Boreal-Laurentian bogs and fens and Northern Appalachian-Acadian acidic swamps.

Formed at the retreat of the last glaciation, these relict habitats have high ecological inertia and specialized adaptations to cold, wet, low nutrient conditions. Peat is the substrate of bogs, fens, and many northern swamps. In these saturated conditions, production of organic material outpaces its decomposition and the result is an accumulation of peat. Peatlands perform critical carbon storage functions.

The Adirondack Park lies at the transition between the temperate and boreal zones. As a result, our boreal wetlands are islands surrounded by temperate forest and critical to regional biodiversity. Because they are naturally disjunct in the landscape, maintaining ecological connectivity between boreal wetlands is particularly important.

Some of the rarest flora and fauna in the state are found in boreal wetlands. These include more than 20 birds considered to be Species of Greatest Conservation Need in New York including olive-sided flycatcher, rusty blackbird, spruce grouse, three-toed woodpecker, and Tennessee warbler. They are nowhere else in New York, and within the park they are confined to these special wetland types. As such, these are responsibility species for the Adirondack Park.

Boreal wetlands in the Adirondacks are important climate change refugia. Refugia are areas relatively buffered from contemporary climate change over time that enable the persistence of valued resources. Peatlands can retain high surface soil moisture and water tables and are often associated with cold-air pooling which can decouple and buffer them from regional climate patterns. Many of our peatlands are associated with lakeshores. Lakes, because of their high heat capacity, can also modify the climate of their surroundings, lending additional value to shoreline peatlands as refugia from regional temperature changes.

Climate change is the most important threat to Adirondack boreal wetlands. These high latitude systems are threatened by warmer temperatures and altered precipitation regimes that have the potential to drastically alter or transition them to new states over time. Peatlands store enormous amounts of terrestrial carbon and alterations to peatland habitats can impact their carbon storage capacity. Existing wetlands protection mechanisms do not account for inundation of peatlands by alterations to hydrology from road or dam construction. Flooding peatlands is a worst case scenario for both greenhouse gas emissions and mercury methylation.

BEST MANAGEMENT PRACTICES

For Regulatory Agencies

1. Protection of boreal habitats should begin at the landscape scale. In the context of regional planning, protect boreal wetlands by identifying and prioritizing critical areas for protection and maintaining them in large habitat blocks, planning for and protecting connectivity between them, assessing climate impacts and vulnerabilities, reducing other stressors such as roads and development to increase their overall resilience, and monitoring them over time to assess adequacy of protection and impacts of climate change.

2. Planning at smaller scales is also critical. In the context of individual projects such as site plans, identify, map and inventory boreal wetlands ahead of the site design, keep development and roads away from these features entirely and buffered from them as much as possible, maintain peatlands in large blocks by protecting large portions of developments as open space, retain or create corridors within areas to be developed to protect ecological connectivity between wetlands, prevent sedimentation and runoff into peatlands, and minimize impervious surface in site design.

3. Recreation can have significant impacts on boreal habitats. Protect them by restricting public access or installing boardwalks in popular destinations, routing trails away from peatlands and prohibiting use of ATVs in or around them, limiting snowmobile use – especially during marginal conditions – to reduce localized effects, avoiding public access in particularly sensitive areas or those with rare plants and sensitive species, and increasing on-the-ground protection for peatlands (e.g., forest rangers).

4. To reduce the impacts of invasive species in boreal wetlands, develop and fund rapid response plans for invasive species, prevent their spread through direct management and minimizing dispersal corridors (e.g., roads), regulate the sale and possession of invasive pests, and maintain boat launch stewards and encourage clean, drain, dry practices to minimize their spread via hydrologic connections.

5. To maintain water quality, hydrologic function, and carbon sequestration, minimize actions that will change what water carries and how water travels to and from peatlands, both above and below ground, maintain/restore water flow across service corridors, restore natural water level fluctuations, divert polluted water sources away from peatlands, reduce fertilizer and pesticide use, avoid ditching and other hydrological alterations, remove obsolete impoundments and ditches, do not dam streams flowing into or out of peatlands, do not excavate peatlands to create waterfowl habitat, and ensure that adjacent land uses or alterations do not interfere with carbon storage functionality of peatlands.

6. To facilitate public appreciation and protection of boreal wetlands, raise awareness among the public about peatland importance and threats, cultivate citizen science opportunities to engage the public in management or monitoring, provide training about peatlands and peatland management, educate users on the effects of recreation on boreal systems, pay landowners to protect peatlands, and create or increase incentives for landowners to buffer wetlands and manage for ecological connectivity.

Image Credit: Brendan Wiltse Photography

Paul Smith's College

Paul Smith's College Adirondack Watershed Institute

Shingle Shanty Preserve and Research Station