

Baseline hydrological monitoring at Big Meadow Bog, Brier Island, Nova Scotia: Preliminary results

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Agricultural ditching of the Big Meadow Bog (BMB) that occurred in the 1950s has destabilized the peatland ecohydrology, resulting in successional changes to the peatland, which may threaten the long-term survivability of the Eastern Mountain Avens (EMA), a globally rare plant species associated with the wetland complex. The ecohydrological changes observed at BMB have also been associated with the establishment of a herring gull colony, resulting in nutrient inputs to BMB and the physical removal of vegetation by gulls around their nesting habitat.

A hydrological field program was initiated in the summer of 2013 to characterize baseline conditions, involving the installation of monitoring wells and the collection of water level and geochemistry data. The results indicate that the hydrological functioning of the BMB system has been impacted by site disturbances. These impacts include a lowered and more variable water level in the central area of BMB due to the effect of the drainage ditch, which can affect peatland morphology and the survival of Sphagnum, the primary peat-forming vegetation. Significantly higher nutrient levels were also detected in BMB, which may be attributed to nutrient enrichment from gulls, ingress of upland minerotrophic water, or mobilization of in-situ nutrients through mineralization.

The combined effect of hydrological modifications to BMB and nutrient enrichment from herring gull populations favours afforestation and displacement of native or pre-disturbance species such as Sphagnum. More study is needed to improve our understanding of the effect of the observed BMB disturbances on EMA populations, although given that EMA is associated with moist, cool habitats, the drying trend observed at BMB could threaten the long-term survivability of the rare species. Additional site characterization is needed to evaluate restoration feasibility, objectives and strategies, and ensure that EMA habitat is preserved or enhanced.