

**Southwest Nova Scotia Habitat Conservation Strategy
Summary Report January 2017**

Habitat Conservation Priority – Barrens

The following represents one of a series of summary documents that have been developed to aid in the dissemination of information presented in the *Southwest Nova Scotia Habitat Conservation Strategy*. For more detailed information, please see the final report, Farrow & Nussey 2015.

Extensive inland barrens located in southwest Nova Scotia, primarily in Yarmouth and Shelburne counties, are a conspicuous feature of the bioregion. Coastal barrens also occur, mainly along the Atlantic Coast, where they are generally isolated by coastal forests and development (Oberndorfer & Lundholm 2009).

Though barrens support relatively low productivity and biomass, they are host to rare species of vascular plants, lichens, and bryophytes in Nova Scotia (Oberndorfer & Lundholm 2009), including Forked Bluecurls (*Trichostema dichotomum*) and Greenland Stitchwort (*Minuartia groenlandica*) (B. Toms, per. comm.). A Cladonia lichen, *Cladonia oricola*, was recently discovered on barrens in Nova Scotia, representing only the second occurrence of this species in North America (unpublished data, Teuvo Ahti & Frances Anderson 2011), and the moss *Dicranum condensatum*, and lichen *Cladonia brevis*, and the shrubs Alpine Bilberry and Newfoundland Dwarf Birch, some of the rarest species in Nova Scotia, are found exclusively on barrens (K. Porter, per. comm.). The majority of rare species on coastal barrens are classified as arctic-alpine and boreal species (Porter 2013). A recent survey of one coastal barren site detected several species of lichens undocumented in Nova Scotia, including the first North American record of the lichen *Rhizocarpon suomiense* (MacDonald *et al.* 2011), suggesting that there is considerable biodiversity in coastal barrens, and in particular lichens and bryophytes, that have yet to be documented and described (J. Lundholm, per. comm.).

The dry, *Corema*-dominated sand barrens of the Annapolis Valley a small area of Queens County are a unique and rare type of barren habitat in the province (Newell 2007). They are strongly dominated by the Broom Crowberry (Carbyn *et al.* 2006), a species of Atlantic Coastal Plain Flora that is relatively common in Nova Scotia (S4 – Secure), but is considered to be rare to uncommon in all other parts of its North American range (NatureServe 2013). It is estimated that greater than 97% of the original open sand barrens occurring in the Annapolis Valley have been lost as a result of fire suppression, agricultural and residential development, sand quarrying, and invasion by non-indigenous species (Catling *et al.* 2004). The provincially endangered Rockrose is most often associated with the Annapolis Valley sand barrens. Conservation of barren habitats within the bioregion will contribute to the conservation of at least 35 priority species.

Nested Conservation Priority Species

- Savannah Sparrow princeps ssp. (SC)
- Rockrose (EN NS)
- Forked Bluecurls
- Greenland Stitchwort
- Newfoundland Dwarf Birch
- Alpine Bilberry

Landscape context assessment of barrens: Good

There are extensive inland barrens located in southwest Nova Scotia, primarily in Yarmouth and Shelburne counties (Figure 1). They are largely located within the Tobeatic Wilderness Area, although an area known as the Shelburne Barrens remain unprotected. Barrens within the Tobeatic Wilderness Area have been lost to forest encroachment in the lifetime of some users, though this trend has not been assessed using aerial photography (B. Toms, per. comm.). Coastal barrens also occur, mainly along the Atlantic Coast (Oberndorfer & Lundholm 2009). Large coastal barren complexes are protected at Kejimikujik National Park Seaside Adjunct and Bowers Meadows Wilderness Area. In contrast, the *Corema*-dominated sand barrens of the Annapolis Valley region are comparatively rare (Newell 2007). It is estimated that greater than 97% of the original open sand barrens occurring in the Annapolis Valley have been lost as a result of fire suppression, agricultural and residential development, sand quarrying, and invasion by non-indigenous species (Catling *et al.* 2004). In total 12,474 ha (38.0%) of barrens in the bioregion are currently under protected or conservation status.

Condition assessment of barrens: Good

Extensive areas of barrens are protected within the bioregion, representing the greatest protection status (38%) of any of the habitat conservation priorities identified in this Habitat Conservation Strategy. Nonetheless, areas of barrens are threatened by habitat destruction and loss by housing, commercial, and mining development, including the extensive Shelburne Barrens which have been threatened by mining developments. Housing developments are among the greatest threats to coastal barrens across the province (Porter 2013). Coastal erosion of exposed headlands also poses a threat, with Hill, Vander Kloet, and Garbary (2012) documenting a loss of 85% of the coastal barren habitat on Gaff Point over the last 35 years. Off-highway vehicle use is one of the most well documented threats to barrens in some areas, where it has

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been shown to severely degrade habitat, damage sensitive vegetation, destroy soil characteristics, and alter hydrology (Oberndorfer & Lundholm 2009; Porter 2013; Simon 2012).

At present, invasive non-native species do not appear to pose a significant threat to coastal barren communities (Oberndorfer & Lundholm 2009), though encroachment on coastal barrens by *Rugosa Rose* has been documented on Brier Island (Garbary 2011). This species is considered an invasive species of coastal barrens in Maine, and should be closely monitored in the bioregion. Scots Pine has been shown to be an aggressive invader of the *Corema*-dominated sand barrens of the Annapolis Valley, shading out native vascular plants (Catling & Carbyn 2005; Newell 2007). Extensive farming, commercial and housing developments, road construction, and sand extraction are also ongoing and imminent threats to sand barrens in the Annapolis Valley (Newell 2007).

Size assessment of barrens: Not Applicable

In total there are 95,342 ha of barrens, which make up 2.4 % of the total area of the bioregion. The average size of inland barrens is 9.7 ha, 9.0 ha for coastal barrens, and 5.9 ha for sand barrens, though there were no minimum size criteria used for barrens, as it does not appear that size is a limiting factor when determining the ecological value of this habitat type (K. Porter, per. comm.).

Current threats to barrens

- 1.1 Cottage and residential development
- 3.2 Mining and quarrying
- 6.1 Off-highway vehicle use
- 8.1 Invasive plants
- 9.3 Agricultural & forestry effluents
- 9.5 Air pollution & acid precipitation

Emerging threats to barrens

- 11.1 Sea-level rise and coastal erosion
- 11.5 Storm-induced coastal erosion

Overall assessment of barrens in the Southwest Nova Scotia bioregion: Good

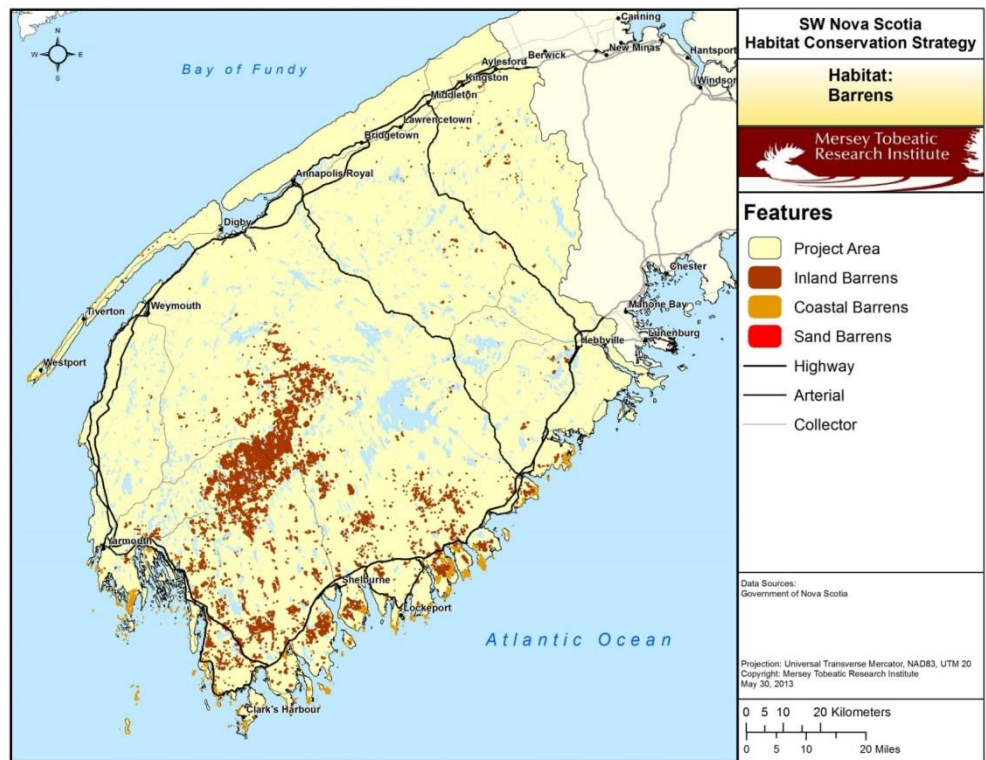


Figure 1. Barrens within the Southwest Nova Scotia bioregion.

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Table 1. Conservation Actions related to barrens for conservation partners in the Southwest Nova Scotia bioregion.

Conservation Actions¹ Description of related action (specific and measurable if possible)	Collaborators	Importance²	Date for Completion	Priority Habitat(s)³	Primary Related Threat(s)
1. Land/Water Protection					
1.1 Site/Area Protection Province of Nova Scotia to designate 68 000 ha of new protected areas under the 14% Protected Areas Initiative.	Province of NS	Necessary	2025	All	
1.1 Site/Area Protection Complete a gap analysis for the system of protected areas in the province.	Province of NS	Beneficial		All	
1.1 Site/Area Protection Secure 500 ha of priority 1 and priority 2 coastal habitat to protect them from development.	NCC	Necessary	2025	Beaches and Dunes, Tidal Marshes, Tidal Flats, Coastal Islands, Barrens	1.1 Cottage and residential development
1.1 Site/Area Protection Acquire priority coastal habitat as opportunities arise.	NSNT	Necessary	2025	Beaches and Dunes, Tidal Marshes, Tidal Flats, Coastal Islands, Barrens	
2. Land/Water Management					
2.1 Site/Area Management Implement management plans for Sand Pond National Wildlife Area and Sable River, Port Joli, Haley Lake, and Port Hebert Migratory Bird Sanctuaries.	EC	Necessary	Ongoing	All	
2.1 Site/Area Management Complete ecological risk assessments to assess threats to species and ecosystems within existing and proposed protected areas. Create a spatial layer of sensitive habitats and ecosystems to aid in planning and an action plan for protected area managers.	Province of NS	Beneficial		All	
2.1 Site/Area Management Continue ecological integrity monitoring to assess the state of forest, freshwater, wetland, and coastal ecosystem health in Kejimikujik National Park through the monitoring, analysis, and reporting of approximately 30 measures (e.g., forest birds, salamanders, water quality, soft-shell clams, Eelgrass) and by summarizing these finding in the <i>State of the Park Report</i> .	Parks Canada through collaboration with many partners	Necessary	Ongoing	All	

¹ Categories based on IUCN – CMP Unified Classification of Conservation Actions Needed (Version 2.0). Actions are meant to be specific and measurable if possible, and are not listed in order of importance.

² CRITICAL: Conservation actions that, without implementation, would clearly result in the reduction of viability of a biodiversity target or the increase in magnitude of a critical threat within the next 5-10 years. Also includes research information that is needed before key decisions can be made on the management of biodiversity targets. NECESSARY: Conservation actions that are needed to maintain or enhance the viability of biodiversity targets or reduce critical threats. Also includes research that will assist in decisions on management of biodiversity targets. BENEFICIAL: Conservation actions that will assist in maintaining or enhancing viability of biodiversity targets and reducing threats.

³ Priority Habitats: Beaches and dunes, tidal marshes, tidal flats, coastal islands, freshwater wetlands, Acadian forest mosaic, riparian and floodplain systems, grasslands/agro-ecosystems, barrens.

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Conservation Actions¹ Description of related action (specific and measurable if possible)	Collaborators	Importance²	Date for Completion	Priority Habitat(s)³	Primary Related Threat(s)
2.1 Site/Area Management Conduct botanical surveys of open bedrock barrens near Shelburne-Yarmouth county line to refine parcel prioritization and document plant communities.	ACCDC	Necessary	2020	Barrens	
2.1 Site/Area Management Synthesize existing data to produce a comprehensive classification of Acadian heathland ecosystem diversity.	St. Mary's University	Necessary	2020	Barrens	
2.2 Invasive/Problematic Species Control Establish a structure to facilitate collaboration and strategic decision making regarding invasive species control techniques.	NCC, MTRI	Beneficial	2020	All	8.1 Invasive/ alien species/ diseases
2.2 Invasive/Problematic Species Control Raise awareness of invasive species in Nova Scotia and the role they play in ecosystems through the Backyard Biodiversity project.	PC, MTRI	Beneficial	Ongoing	All	8.1 Invasive / alien species/ diseases
3. Species Management					
4. Education and Awareness					
4.3 Awareness and Communications Address habitat threats through the education and engagement of stakeholders, landowners, and landusers.	NSNT	Beneficial	Ongoing		
5. Law and Policy					
5.1.2 Legislation (National level) <i>Implement the Migratory Bird Convention Act, Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act, Species at Risk Act, Canadian Environmental Protection Act, Canada Wildlife Act, Environmental Enforcement Act, Canadian Environmental Assessment Act, Fisheries Act.</i>	EC, DFO	Necessary	Ongoing		
5.1.3 Legislation (Sub-national level) Participate in the review and update of the <i>Nova Scotia Mineral Resources Act</i> and seek appropriate mechanisms for resolution of conflicts between private conservation lands and sub-surface rights.	NCC, NSNT	Beneficial	2016		3.2 Mining and quarrying
5.4 Compliance and Enforcement Undertake wildlife and environmental enforcement activities (EC Wildlife Enforcement, Environmental Enforcement); address illegal hunting and disturbance, illegal activities and habitat destruction	EC, Province of NS	Necessary	Ongoing	All	
6. Livelihood, Economic, and Other Incentives					
6.4 Conservation Payments Implement and encourage the use of EC Ecological Gifts (Ecogifts) program.	EC, NCC, NSNT	Necessary	Ongoing	All	
7. External Capacity Building					
7.3 Conservation Finance Communicate, inform, and increase awareness related to funding opportunities for conservation: <i>North American Wetland Conservation Act</i>	EC, US Federal and State partners	Necessary	Ongoing	All	

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Conservation Actions ¹ Description of related action (specific and measurable if possible)	Collaborators	Importance ²	Date for Completion	Priority Habitat(s) ³	Primary Related Threat(s)
(NAWCA)/Eastern Habitat Joint Venture (EHJV), North Atlantic Landscape Conservation Cooperative (NALCC); National Conservation Plan (NCP): Atlantic Ecosystems Initiative (AEI), Habitat Stewardship Program (HSP), Aboriginal Fund for Species at Risk (AFSAR), National Wetland Conservation Fund (NWCF).					
7.3 Conservation Finance Continue to engage longstanding/key funding partners to support conservation work in the SWNS bioregion.	NCC, MTRI, NSNT, ENGOs	Necessary	Ongoing	All	

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