



High Conservation Value Forest Assessment Report for the Medway District

May 6, 2016

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Preamble

In 2008, due to customer demand for FSC-certified paper, Bowater Mersey Paper Company Ltd. – Mersey Woodlands Operations decided to undertake Forest Stewardship Council (FSC) Forest Management Certification for its Medway District. The first two versions of this High Conservation Value Forest (HCVF) report were completed in fulfillment of this objective. The Medway District was subsequently certified to the FSC Maritime Standard in 2010. In 2012, following the closure of Bowater Mersey Paper Company Ltd. and their woodlands operations in southwest Nova Scotia, the Province of Nova Scotia, through the Department of Natural Resources (NSDNR), acquired Bowater assets and woodland within this area. This acquisition supports the Province in meeting various objectives, including the completion of a Protected Areas Plan, as well as securing the necessary lands to allow sustainable resource use and biodiversity conservation. Following a recertification audit in the spring of 2013, the FSC certificate for the Medway District was transferred to NSDNR. In February 2016, the FSC certification for Medway District was discontinued. However, the current Medway District Management plan and HCVF report will continue to be implemented.

As part of the Province's integrated plans for the management of these lands as part of a broader Western Crown Lands management process, NSDNR decided to maintain the certification of these lands under the Forest Stewardship Council. Consequently, this High Conservation Value Forest (HCVF) Report is revised to reflect this objective and the changes since it was originally written.

To this end, the NSDNR sought input on a draft HCVF Assessment Report from the Mi'kmaq through consultation with the Kwi'mu'kw Maw-klusuaqn (KMK) Negotiation Office and the Native Council of Nova Scotia. The Mersey Woodlands Forest Advisory Committee was introduced to the Government's effort to revise the HCVF Assessment for Medway District. Input was sought from affected parties including the Mersey Tobetic Research Institute, Southwest Nova Biosphere Reserve, and new western Crown land licensee, Westfor Management Inc. The draft Assessment was also reviewed by two External Reviewers in Academia with experience in forest certification.

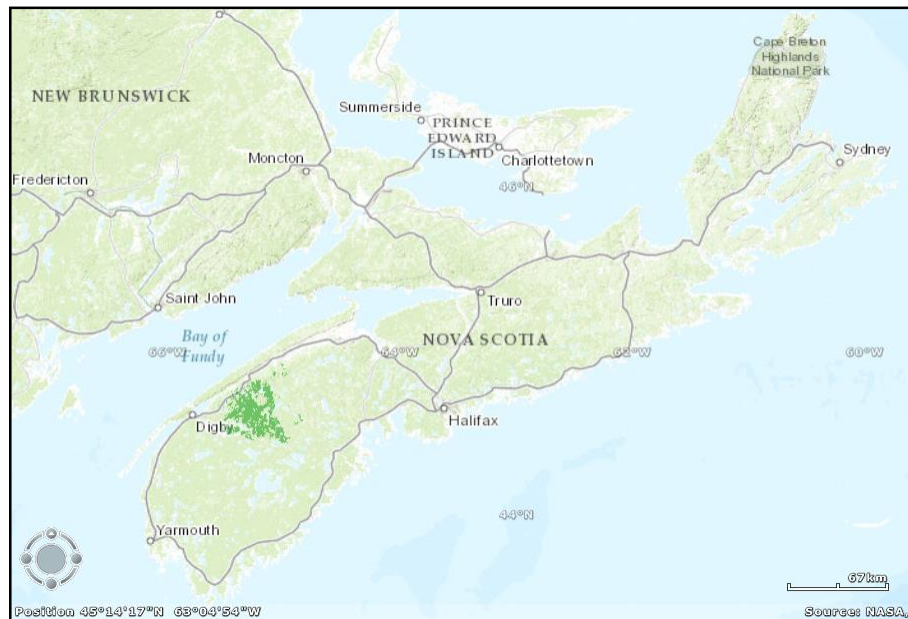
This HCVF Assessment report builds on previous iterations and includes updated and improved analyses, and revisions resulting from consultation sessions highlighted above.

Introduction

All forests contain environmental and social values such as wildlife habitat, watershed protection, and cultural significance. Where these values are considered to be of outstanding significance or critical importance, the forest area associated with the value(s) can be defined as a High Conservation Value Forest (HCVF). Identifying these areas is the first step – developing appropriate management strategies to ensure identified High Conservation Values (HCVs) remain intact is the challenge.

The HCVF concept was developed by the FSC for use in forest certification. Under FSC certification, forest managers are required to identify any HCVs that occur within their forest management units and manage them to maintain or enhance the values identified.

The Medway District is located in southwestern Nova Scotia, northeast of the Tobeatic Wilderness Area and Kejimkujik Park, and west of the Cloud Lake Wilderness Area (Figure 1). In 2011, a land sale reduced the original certified landbase by 5,870 ha. This HCVF report update is for the remaining area comprised of approximately 92,130 ha of coniferous, mixedwood, and deciduous forest. The majority of the Medway District lies within the South Mountain ecodistrict, one of eight ecodistricts found in the Western ecoregion of Nova Scotia (Neily et al., 2005). This ecodistrict is characterized by shallow, stony, and dry soils with large granite boulders throughout. Maximum elevation is 250 m above sea level. The Medway District also spans three watersheds, with the Medway and Mersey Rivers flowing to the south and the Round Hill River flowing north.



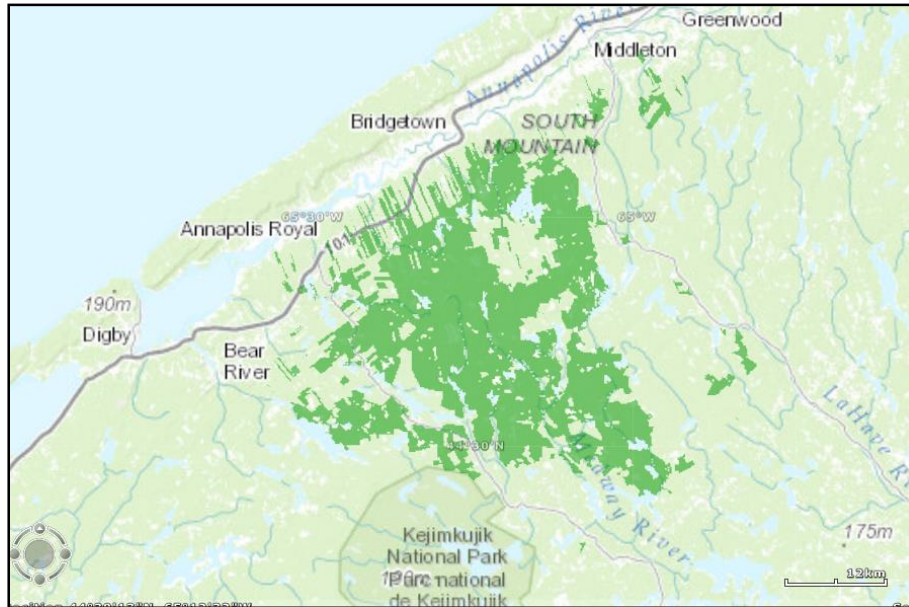


Figure 1. Overview maps showing the location and distribution of Medway District lands.

Nova Scotia is located within the Maritimes region of Canada and is dominated by the Acadian forest type. Hence, this assessment of HCVs was conducted in accordance with Principle 9 of the FSC Certification Standards for Best Forestry Practices in the Maritimes Region (FSC-STD CANMaritimes-2008).

Identification of HCVs is a dynamic process by which new information is continually being integrated into the assessment process. As it has in the past, the nature and character of the Medway District will continue to evolve and revisions to this document will need to occur on a periodic basis. A significant recent development has been the announcement of the Province’s Parks and Protected Areas (PAPA) plan. Wilderness Areas announced in this plan are prominently represented in and near the Medway District which supports objectives in the previous “Landscape Ecological Management Zoning” approach.

To address new information and to ensure management strategies for each HCVF continue to be effective, NSDNR will continue to work with affected parties to ensure current information is shared and incorporated into the planning process. The HCVs for Medway District have been summarized in Table 1. Special management zones (SMZs) along watercourses, waterways, and other wetland features are one of the most significant HCVs identified. Table 2 identifies the various special management zones applied in the various harvest prescription and watercourse size.

Table 1. Summary of the HCVs and their management strategy for the Medway District.

Please note this table summarizes some of the HCVs and their management strategies. A complete list and description of HCVs and their management strategies can be found in the main report.

High Conservation Value	Feature	Management Strategy
Category 1 – Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values.		
Old growth forest	American Marten	<ul style="list-style-type: none"> ▪ No harvesting in proposed protected areas known as Medway Lakes Wilderness Area until the Parks and Protected Areas Plan is complete. ▪ NSDNR Old Forest Policy ▪ 100-year wildlife habitat objective
Large diameter snags	Chimney Swift	<ul style="list-style-type: none"> ▪ Protection of large trees through: <ul style="list-style-type: none"> ○ Management Zones (extensive, intensive and forest conservation reserves) ○ Legacy snag/cavity tree retention during harvesting ○ Using pre-treatment assessments to guide harvest prescriptions ○ Establish special management (no harvest) zones adjacent watercourses ≥ 50 cm wide
Open forest/regenerating cutovers	Common Nighthawk	<ul style="list-style-type: none"> ▪ 100-year wildlife habitat objective ▪ Clearcut silvicultural prescriptions
Treed fens, lakeshore wetlands, seasonally flooded flats, rivers and streams	Rusty Blackbird, Olive sided flycatcher, Canada warbler	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses ≥ 50 cm wide
Lakes, ponds, marshes, bogs and open water in Mersey and Medway watersheds	Blanding’s Turtle/ Eastern Ribbonsnake	<ul style="list-style-type: none"> ▪ Identify proposed forest operations in critical habitat and focus research survey efforts ▪ Participate in and implement recovery team recommendations

		<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses \geq 50 cm wide and water bodies ▪ Respect NSE stream crossing permit
Round Hill River and tributaries \geq 50 cm in width	Atlantic Salmon	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses \geq 50 cm wide ▪ Respect NSE stream crossing permit ▪ Consider recovery team recommendations
Riparian zones adjacent lakes, rivers, and fens	Atlantic Coastal Plains Flora	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses \geq 50 cm wide ▪ Continue to support surveys by experts
Balsam fir stands within 50 m of a wetland and 25 km of the Bay of Fundy	Boreal Felt Lichen	<ul style="list-style-type: none"> ▪ Follow DNR Special Management Practices for Boreal Felt Lichen
Treed bogs	Invertebrates	<ul style="list-style-type: none"> ▪ No harvest operations in treed bogs
Sandy Bottom, Boot, Gull, and Frog Lakes and Liverpool and West Branch Liverpool Rivers	Brook Trout	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent Sandy Bottom, Boot, Gull and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers ▪ Respect NSE stream crossing permit ▪ Continue to support surveys by experts
<p>Forest Structure including:</p> <ol style="list-style-type: none"> 1. Stick and cavity nests 2. Wildlife clumps 3. SMZs 4. Snag/cavity trees left after harvest 5. Old growth forest 6. Late seral stage species 	Forest dependent species including Southern Flying Squirrel and Eastern Pipistrelle	<ul style="list-style-type: none"> ▪ 100- to- 200-m buffer on raptor, bald eagle, osprey, and Great Blue heron nests ▪ Retention of legacy snag/cavity trees and wildlife clumps after harvest operations ▪ Establish special management (no harvest) zones adjacent watercourses \geq 50 cm wide ▪ Management zones (no harvest Conservation Zone) and recruitment of old growth forest if found ▪ Continue to support surveys by experts

		<ul style="list-style-type: none"> ▪ Restricting maximum opening size to 50 ha ▪ 100-year wildlife habitat objectives for Golden-crowned kinglet, Common nighthawk, and American marten ▪ Silvicultural prescriptions based on Forest Ecosystem Classification
Lands adjacent Kejimikujik National Park; Tobeatic, McGill, and Cloud Lake Wilderness Areas; and West Branch Medway River Nature Reserve	Lands adjacent to protected areas	<ul style="list-style-type: none"> ▪ Management plans adjacent to within 500 m of a National Park or Wilderness Area and 50 m of a Nature Reserve reviewed with the appropriate agency and recommendations addressed ▪ Harvest areas posted on-line for public review
Areas that include a breadth of species and ecosystems, including but not limited to species-at-risk.	Biodiversity Rich Landscapes (BRLs)	<ul style="list-style-type: none"> ▪ Refer to <i>Guidelines for Biodiversity Rich Landscapes under the Western Crown Lands Conceptual Plan</i> (July 2015)
<p>Category 2 – Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.</p>		
Corridor of continuous forest cover between adjacent protected areas	Long-term species persistence	<ul style="list-style-type: none"> • No harvesting in proposed protected areas known as Medway Lakes Wilderness Area until the Parks and Protected Areas Plan is complete.
<p>Category 3 – Forest areas that are in or contain rare, threatened or endangered ecosystems.</p>		
Ecosites identified in NSE's significant ecosite database; East Stoney Lake and nearby wetland; Red maple fens	Naturally rare ecosystems	<ul style="list-style-type: none"> ▪ Special management prescriptions for significant ecosites ▪ Establish special management (no harvest) zones adjacent watercourses ≥ 50 cm wide and water bodies ▪ No harvesting in treed fen or hardwood swamp wetlands ▪ No operations in wetlands identified by the DNR wetland database or other known wetlands
Stands where climax species comprise ≥ 30 percent of the forest stand and are greater	Declining ecosystems	<ul style="list-style-type: none"> ▪ No harvesting in proposed protected areas known as Medway Lakes Wilderness Area

than 120 years old; bathing holes used by bears in the Morehouse Lake area		<p>until the Parks and Protected Areas Plan is complete and recruitment of old growth forest if found</p> <ul style="list-style-type: none"> ▪ Increase multi-aged stands with late seral species through implementation of Pretreatment Assessments ▪ Survey for bear bathing hole and create special management zone if found
Ecosections and Elements identified in the representivity gap analysis that lack representivity	Under represented ecosections and elements	<ul style="list-style-type: none"> ▪ No harvesting in proposed protected areas known as Medway Lakes Wilderness Area until the Parks and Protected Areas Plan is complete. ▪ Investigate uniqueness of ecosections and elements ▪ Manage to favour restoration and maintenance of natural ecosystem conditions
Unique Areas and wetlands	Unique forest ecosystems	<ul style="list-style-type: none"> ▪ No operations within Unique Areas, bogs, marshes, fens, and meadows ▪ Establish special management (no harvest) zones adjacent watercourses ≥ 50 cm wide and water bodies
Category 4 – Forest areas that provide basic services of nature in critical situations.		
Special management zones	Water bodies, watercourses and riparian buffers	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses ≥ 50 cm wide and water bodies ▪ Use depth-to-water table model to predict stream locations ▪ Narrow right-of-ways through riparian areas
Wetlands	Ecological services	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent wetlands with the exception of shrub bogs, shrub swamps, and treed bogs ▪ Establish special management (no harvest) zones adjacent water bodies or wetlands with known species at risk
Category 5 – Forest areas fundamental to meeting basic needs of local communities.		

10, 100 Series Highways, Tourist scenic routes; known canoe routes, portages, and boating entry points; ungated access and recreational opportunities	Viewscapes and recreation activities	<ul style="list-style-type: none"> ▪ Leave variable width special management (no harvest) zones adjacent Highways 1, 8, 10, and 101 and certain canoe routes ▪ Leave canoe portages and boat entry points brush free after forest operations ▪ Encourage recreation on foot or bicycle ▪ Permit sanctioned all-terrain vehicle rallies
Category 6 – Forest areas critical to local communities’ traditional cultural identity.		
Sites of archaeological significance and Lohnes Lake Memorial site	Traditional cultural identity and memorial sites	<ul style="list-style-type: none"> ▪ Establish special management (no harvest) zones adjacent watercourses \geq 50 cm wide and water bodies ▪ Consult Nova Scotia Museum during harvest planning if required to determine appropriate special management zone

Table 2. Special management zones for watercourses in the Medway District.

Forest Harvest Prescription	Special Management Zone
Clear cut or Seed Tree	<p>Watercourse >50 cm average width</p> <ul style="list-style-type: none"> • 30m special management zone (no forest harvest zone) unless on an approved crossing • To comply with the buffer zone extension required on slopes along watercourses (provincial regulation) a 1 m addition will be made for every 2 percent increase above 40 percent slope up to a maximum of 60 m <p>Watercourse < 50 cm average width</p> <ul style="list-style-type: none"> • Leave high stumps • Machine free zone of 5 m unless on approved crossing
Partial Harvest (Selection, Shelterwood, Commercial Thinning)	<p>Watercourse >50 cm average width</p> <ul style="list-style-type: none"> • 20m special management zone (no forest harvest zone) unless on an approved crossing • To comply with the buffer zone extension required on slopes along watercourses (provincial regulation) a 1 m addition will be

	<p>made for every 2 percent increase above 40 percent slope up to a maximum of 60 m</p> <p>Watercourse < 50 cm average width</p> <ul style="list-style-type: none"> • Leave high stumps • Machine free zone of 5 m unless on approved crossing
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Forest areas containing globally, regionally, or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia).

1. Does the forest contain species at risk or potential habitat of species at risk as listed by international, national, or territorial/provincial authorities?

The number of species at risk in Nova Scotia and Canada continues to grow. Species listed under the Nova Scotia Endangered Species Act increased from 33 in 2010 (when the first HCVF report was produced) to 52 as of 2014. Table 3 lists the species in Nova Scotia assessed as “at risk” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed under the federal Species at Risk Act (SARA). Table 4 shows the status of species listed under the Nova Scotia Endangered Species Act (NSES). In Table 3 and Table 4, the + sign indicates species most likely to be relevant to the Medway District area and it is these species that are the focus of this section of the report. Actual known records of species at risk are documented in other Appendices and 2 Figures discussed under Question 4.

In general, species at risk in the Medway District will be protected and managed in compliance with the Nova Scotia Endangered Species Act. Under this Act it is prohibited to kill or disturb an Endangered or Threatened species. Management is required under the Act in the form of Recovery Plans and Recovery Teams. For Vulnerable species, Management plans are required. On Crown land, efforts are made to protect species at risk and their habitat through Integrated Resource Management Planning. NSDNR will work with partners inside and outside of government to promote recovery and protection of species at risk (e.g., Parks Canada, Environment Canada, Department of Fisheries and Oceans, the Mersey Tobeatic Research Institute, Universities and Colleges, Mi’kmaq groups, land trusts, and private landowners). An objective of the Province’s Parks and Protected Areas System Plan is to capture species at risk in new Wilderness Areas and Nature Reserves. Considerable funding has been directed at species at risk recovery and stewardship from the Federal Habitat Stewardship Fund for Species at Risk, the Nova Scotia Habitat Conservation Fund, and the Nova Scotia Species at Risk Fund.

Table 3. COSEWIC and federally listed species found in Nova Scotia. The + sign indicates species likely or potentially associated with the Medway District. Note: Strictly marine species are not included in this list.

Common Name	Taxon	COSEWIC	SARA
+ Little Brown Myotis	Mammals	Endangered	
+ Northern Myotis	Mammals	Endangered	
+Tri-colored Bat	Mammals	Endangered	
Atlantic Walrus	Mammals	Special Concern	
Gaspe Shrew	Mammals		Special Concern
Eskimo Curlew	Birds	Endangered	Endangered
Piping Plover	Birds	Endangered	Endangered
Roseate Tern	Birds	Endangered	Endangered
Red Knot	Birds	Endangered	Endangered
+Chimney Swift	Birds	Threatened	Threatened
Least Bittern	Birds	Threatened	Threatened
+Canada Warbler	Birds	Threatened	Threatened
+Common Nighthawk	Birds	Threatened	Threatened
+Olive-sided Flycatcher	Birds	Threatened	Threatened
Eastern Whip-poor-will	Birds	Threatened	Threatened
Bicknell's Thrush	Birds	Threatened	Threatened
+Bank Swallow	Birds	Threatened	
+Barn Swallow	Birds	Threatened	
Bobolink	Birds	Threatened	
+Eastern Meadow Lark	Birds	Threatened	
Wood Thrush	Birds	Threatened	
Barrow's Goldeneye	Birds	Special Concern	Special Concern
+Eastern Wood-pewee	Birds	Special Concern	
Harlequin Duck	Birds	Special Concern	Special Concern
+Rusty Blackbird	Birds	Special Concern	Special Concern
Savannah Sparrow	Birds	Special Concern	Special Concern
Short-eared Owl	Birds	Special Concern	Special Concern
+Peregrine Falcon	Birds	Special Concern	Special Concern
Gypsy Cuckoo Bumble	Arthropods	Endangered	
Marcropis Cuckoo Bee	Arthropods	Endangered	
Sable Island Sweat Bee	Arthropods	Threatened	
+Monarch	Arthropods	Special Concern	Special Concern
+Blanding's Turtle	Reptiles	Endangered	Endangered
+Eastern Ribbonsnake	Reptiles	Threatened	Threatened
+Wood Turtle	Reptiles	Threatened	Threatened
+Snapping Turtle	Reptiles	Special Concern	Special Concern
Yellow Lampmussel	Molluscs	Special Concern	Special Concern
Brook Floater	Molluscs	Special Concern	Special Concern
+Atlantic Salmon	Fishes	Endangered	Endangered
Atlantic Whitefish	Fishes	Endangered	Endangered
Striped Bass	Fishes	Endangered	
American Eel	Fishes	Threatened	
Atlantic Sturgeon	Fishes	Threatened	
+Pink Coreopsis	Vascular Plants	Endangered	Endangered
+Plymouth Gentian	Vascular Plants	Endangered	Threatened

Common Name	Taxon	COSEWIC	SARA
+Eastern Mountain Avens	Vascular Plants	Endangered	Endangered
+Thread-leaved Sundew	Vascular Plants	Endangered	Endangered
+Tall Beakrush	Vascular Plants	Endangered	
Eastern Baccharis	Vascular Plants	Threatened	
+Golden Crest	Vascular Plants	Special Concern	Threatened
+Tuberclad Spike-rush	Vascular Plants	Special Concern	Special Concern
+Water-pennywort	Vascular Plants	Special Concern	Threatened
+Eastern Lilaeopsis	Vascular Plants	Special Concern	Special Concern
+Redroot	Vascular Plants	Special Concern	Special Concern
+Long's Bulrush	Vascular Plants	Special Concern	Special Concern
+New Jersey Rush	Vascular Plants	Special Concern	Special Concern
+Sweet Pepperbush	Vascular Plants	Threatened	Special Concern
+Prototype Quillwort	Vascular Plants	Special Concern	Special Concern
+Boreal Felt Lichen	Lichens	Endangered	Endangered
+Vole Ears Lichen	Lichens	Endangered	Endangered
+Eastern Waterfan	Lichens	Threatened	-
+Blue Felt Lichen	Lichens	Special Concern	-
+Frosted Glass-whiskers	Lichens	Special Concern	Special Concern

Table 4. All listed species under the Nova Scotia Endangered Species Act (NSEA). The + sign indicates species likely or potentially associated with the Medway District. ACPF = Atlantic Coastal Plains Flora.

Common Name	Taxon	NSEA
+Little Brown Myotis	Mammals	Endangered
+Northern Myotis	Mammals	Endangered
+Tri-colored Bat	Mammals	Endangered
American Marten (Cape Breton Population)	Mammals	Endangered
Canada Lynx	Mammals	Endangered
+Moose (Mainland)	Mammals	Endangered
+Chimney Swift	Birds	Endangered
Harlequin Duck	Birds	Endangered
Piping Plover	Birds	Endangered
Red Knot	Birds	Endangered
Roseate Tern	Birds	Endangered
Bicknell's Thrush	Birds	Endangered
+Barn Swallow	Birds	Endangered
+Canada Warbler	Birds	Endangered
+Rusty Blackbird	Birds	Endangered
+Common Nighthawk	Birds	Threatened
+Olive-sided Flycatcher	Birds	Threatened
Eastern Whip-poor-will	Birds	Threatened
+Peregrine Falcon	Birds	Vulnerable
+Eastern Wood-pewee	Birds	Vulnerable

Common Name	Taxon	NSESA
Bobolink	Birds	Vulnerable
Macropis Cuckoo Bee	Arthropods	Endangered
+Blanding's Turtle	Reptiles	Endangered
+Eastern Ribbonsnake	Reptiles	Threatened
+Wood Turtle	Reptiles	Threatened
+Snapping Turtle	Reptiles	Vulnerable
Yellow Lamp Mussel	Molluscs	Threatened
Brook Floater	Molluscs	Threatened
Atlantic Whitefish	Fishes	Endangered
Eastern Mountain Avens	Vascular Plants	Endangered
+Pink Coreopsis (ACPF)	Vascular Plants	Endangered
+Plymouth Gentian (ACPF)	Vascular Plants	Endangered
+Ram's-Head Lady Slipper	Vascular Plants	Endangered
+Rockrose (Canada Frostweed) (ACPF)	Vascular Plants	Endangered
+Thread-leaved Sundew (ACPF)	Vascular Plants	Endangered
+Water-Pennywort (ACPF)	Vascular Plants	Endangered
Hoary Willow	Vascular Plants	Endangered
Eastern Baccharis (ACPF)	Vascular Plants	Threatened
+Black Ash	Vascular Plants	Threatened
+Golden-crest (ACPF)	Vascular Plants	Vulnerable
+Redroot (ACPF)	Vascular Plants	Vulnerable
+Tuberclad Spikerush (ACPF)	Vascular Plants	Vulnerable
Eastern Lilaeopsis (ACPF)	Vascular Plants	Vulnerable
+Eastern White Cedar	Vascular Plants	Vulnerable
+Long's Bulrush (ACPF)	Vascular Plants	Vulnerable
+New Jersey Rush (ACPF)	Vascular Plants	Vulnerable
+Prototype Quillwort	Vascular Plants	Vulnerable
+Sweet Pepperbush (ACPF)	Vascular Plants	Vulnerable
+Spotted Pondweed (ACPF)	Vascular Plants	Vulnerable
+Boreal Felt Lichen	Lichens	Endangered
+Vole Ears Lichen	Lichens	Endangered
+Blue Felt Lichen	Lichens	Vulnerable

This current HCVF document does not use the LEMZ (Landscape Ecology Management Zone) system used in the 2010 HCVF plan. However, the same values (e.g., large natural patches, connectivity, wetlands, and old forest) have largely been protected using other mechanisms. New protected areas proposed for the Medway District have also been identified. These areas represent approximately 15 percent of the entire Medway District. The Biodiversity Rich Landscape (BRLs) polygon under Western Crown Land Planning will also provide enhanced protection for biodiversity values (Figure 2). Interim operational forest harvesting guidelines for BRLs include: Favour restoration of natural conditions; Conserve special biodiversity features; Reduce road impact; Conserve old growth forests; Foster connectivity of mature forest; and

conserve wetland habitats. These management strategies will maintain landscape level ecological features as well as afford habitat protection for many species at risk.

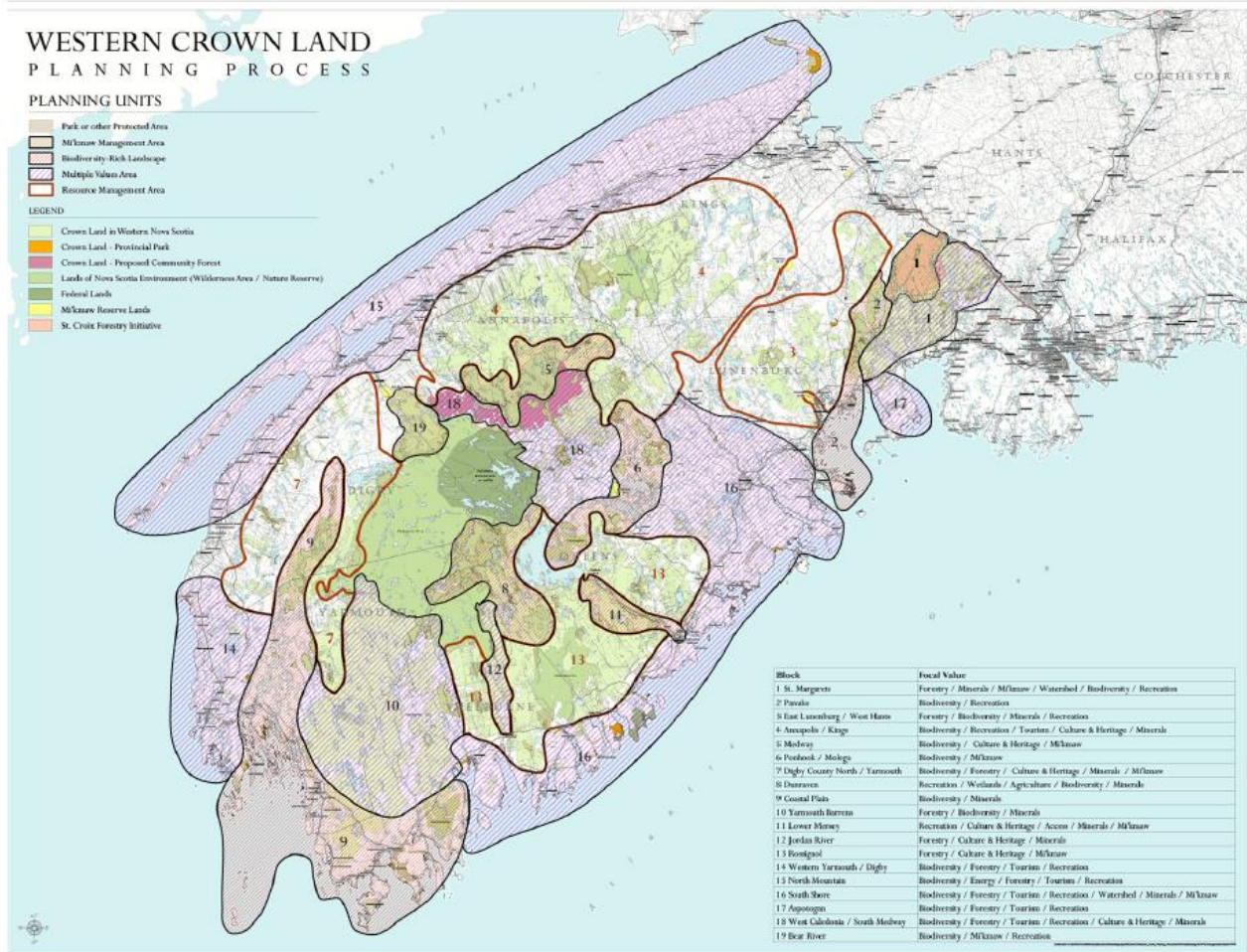


Figure 2. Map showing the Biodiversity –Rich Landscapes, provincial Crown land, and protected areas.

Species-specific information and management strategies for focal species at risk are detailed below.

Eastern (Mainland) Moose

Forest Requirements:

Nova Scotia's mainland moose (*Alces alces americana*) were listed as Endangered under Nova Scotia's Endangered Species Act (S.N.S. 1998, c.11) in 2003 due to the small declining population and poorly understood complex threats faced by the species. Moose have complex habitat requirements that include a mosaic of woodland and wetland habitat types that provide food, shelter, and appropriate thermal conditions (NSDNR, 2007; Parker, 2003). Specific spatial and temporal habitat preferences and limiting factors are poorly understood. However, recent analysis indicates that moose in Nova Scotia may be subject to thermoregulatory stress during warm periods (Broders et al., 2012) and may rely on mature stands that provide adequate cover.

Moose use most stages of forest development throughout their life (NSDNR, 2007). Typically, the twigs, stems, and foliage of deciduous trees and shrubs are the most common source of food. In summer moose seek out aquatic vegetation in wetlands and lakes, and when temperatures increase, use closed-canopy conifer forest for thermoregulation. They also find sources of water to cool themselves and escape from insects when temperatures are high. Moose also use a variety of mature conifer and mixedwood forest types for shelter and protection from winter weather conditions and predators.

Distribution:

Moose were common and found province-wide prior to European settlement and remained widespread, despite periods of decline, until the 1940s (Parker, 2003). Aerial surveys in the 1960s and 1970s confirmed a significant province-wide decline in moose distribution and numbers. Hunting of Mainland moose has been prohibited since 1981 and only a small population (150) is thought to exist in southwest Nova Scotia. The Medway District lies immediately east of one known moose concentration area (Figure 3) centered in the Kejimikujik National Park and Tobeatic Wilderness Area (NSDNR, 2012a), and moose have been reported in the northern half of the Medway District.

High Conservation Value Identified:

The existing moose concentration areas were developed using a rigorous approach and the area of overlap with the Medway District will be designated as HCV. This will be reassessed as additional information is obtained on the distribution of moose within the Medway District and their temporal and special forest needs are identified at a landscape level.

Management Strategy:

In the area of overlap with identified moose concentration areas, special management practices will be implemented (described at: <http://novascotia.ca/natr/wildlife/habitats/terrestrial/>). Outside of concentration areas, we will continue our leadership role in the Mainland Moose Recovery Team, and will work with our

partners to address priority tasks in the species Action Plan (McNeil, 2013), including the development of tools to support forest management planning decision making at multiple spatial scales for moose habitat requirements. The Action Plan also identifies poaching and human induced disturbance from roads as threats to the recovery of the mainland moose population.

To reduce impacts of access to the mainland moose, guidelines to reduce road impacts are in place within the Medway Lakes Biodiversity Rich Landscape.

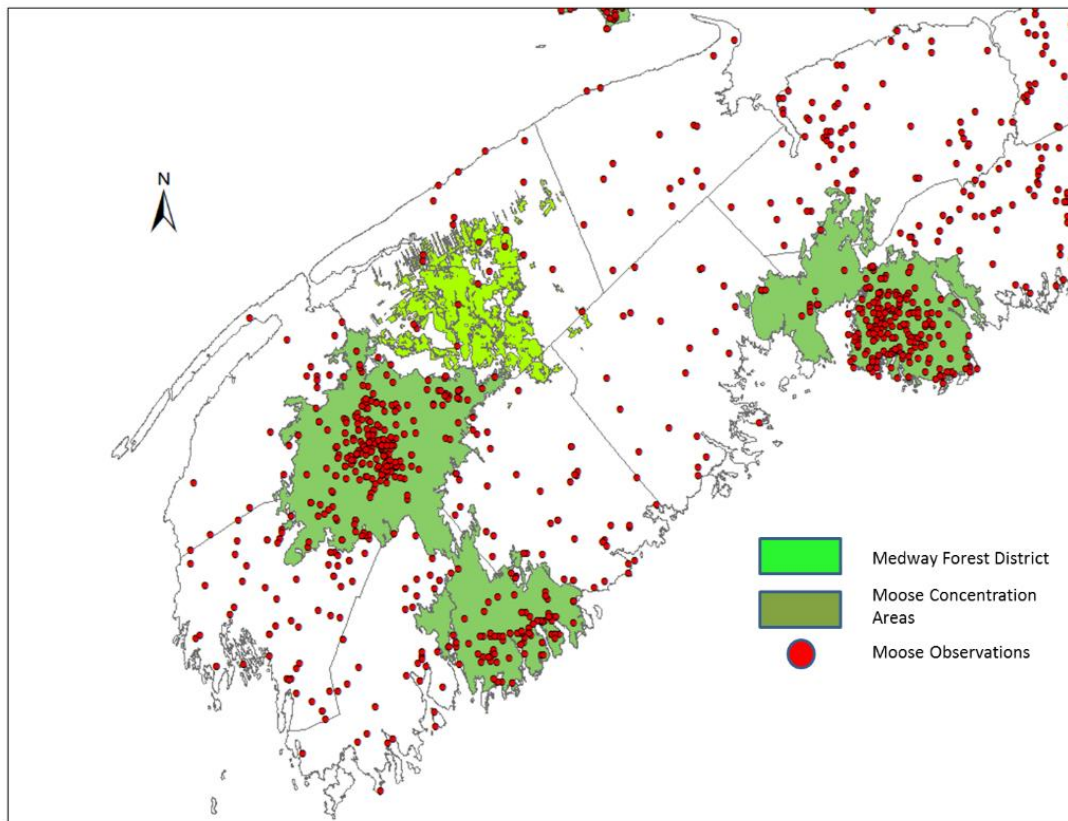


Figure 3. Map showing observation locations and concentration areas for endangered mainland moose (2000-2013) in southwestern Nova Scotia.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations. The importance of anti-poaching efforts, including enforcement, will be emphasized amongst staff and contractors and with local organizations to reach a wider audience.

American Marten

Forest Requirements:

American marten (*Martes americana*) are frequently reported to require late-successional conifer dominated forests (Soutiere, 1979; Buskirk and Powell, 1994; Thompson and Colgan, 1994; Thompson and Harestad, 1994; Cheveau et al., 2013). Late-successional conifer forests provide cover and escape routes from predators, coarse woody debris for denning and subnivean access, and prey that consists mainly of small mammals (Nova Scotia American Marten Recovery Team, 2006). Typical stand level structural requirements associated with late successional forests include an intermediate canopy closure and a diverse understorey that is favoured by marten prey species (Buskirk and Powell, 1994; Sturtevant et al., 1996; Huggard, 1999).

Work in Maine and Quebec has suggested that marten will occupy younger mixedwood and conifer dominated habitats that meet structural requirements (Potvin et al., 2000; Payer and Harrison, 2000), and it is increasingly being shown that marten can be found in a range of forest stands with complex vertical and horizontal structure (see for example Cheveau et al., 2013). Within the Acadian forest, vertical and horizontal structure may be more important habitat components than species overstory composition or age alone (Payer and Harrison, 2000). However, despite provision of coarse woody debris, marten will not use regenerating clearcuts until a threshold of overstory development has been reached (between 14 and 18 m²/ha) (Payer and Harrison, 1999); and a threshold for the retention of mature forest >70% within the animal's home range (4-10km²) has been suggested below which marten population density and productivity decline (Thompson and Harestad (1994); Bissonette et al., (1997); Hargis et al., (1999); Payer and Harrison (1999, 2000); Potvin et al., (2000); Cheveau et al., (2013)).

Forest stand type suitability rankings were developed to enable restrictions within the wood supply model to ensure high valued forest conditions are maintained for American marten. Softwood stands with an overmature and mature maturity class are predicted to contribute a higher suitability than younger softwood stands. The wood supply model limits harvesting to meet the objective of maintaining 80 percent of current high valued forest stand types. Forest stand type suitability rankings are available in Appendix 2.

Distribution:

Although only the Cape Breton population is listed under the Nova Scotia Endangered Species Act, there is still concern over the status of marten in the rest of the province. There is some evidence that a remnant population of marten existed in Southwestern Nova Scotia (M. O'Brien pers. comm.) prior to the re-introduction of 116 animals to Kejimikujik National Park in the period 1987-1994 (Nova Scotia American Marten Recovery Team, 2006). Reported sightings and surveys undertaken since 2000 indicate marten are found in Annapolis, Digby, and Yarmouth counties with more than 20 records in, or closely associated with, the Medway District outside of designated and pending protected areas (Figure 4). While these are only sighting or trapping records (i.e., not evidence of breeding or denning), they do support the possibility that reproductive marten exist within the Medway District.

High Conservation Value Identified:

The abundance and breeding status of American marten in the Medway District is uncertain and so precautionary measures will be adopted to ensure forest structure exists for this species within the area.

The Medway Management Plan details wildlife habitat objectives for marten over the next 100 years.

All old growth forest and protected areas are designated as HCV for American marten.

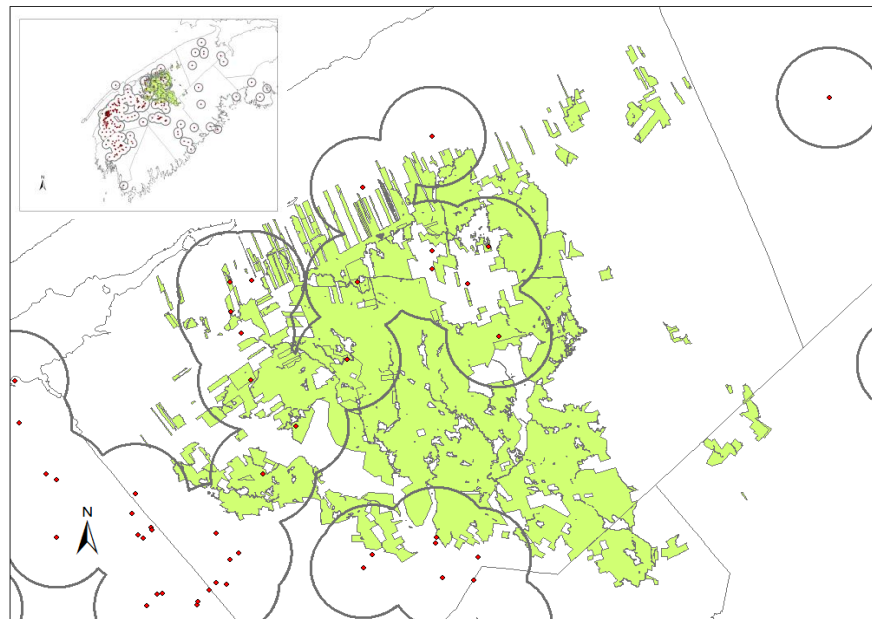


Figure 4. American marten locations in and around the Medway District encompassed by 5 kilometre radius buffers.

Management Strategy:

American marten has been selected as one of three species for which habitat objectives have been set for the Medway District. Objectives include no decline in high value habitat for 100 years. This species was chosen as an Indicator, or key stone species. Hence, we can infer that maintaining habitat for marten will maintain habitat for many other species. Wood supply modelling will incorporate specific marten habitat requirements throughout the 100-year planning horizon. This objective will be evaluated every five years.

Old growth forest confirmed by NSDNR staff in the future will be designated as HCVs.

No harvesting will be carried out in the proposed Medway Lakes Wilderness Area pending completion of the Parks and Protected Areas Plan.

NSDNR will continue to work with partners to determine marten locations in the Medway District and modify management to address new information.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Chimney Swift

Forest Requirements:

Historically, the chimney swift (*Chaetura pelagica*) nested in large hollow trees, tree cavities, or caves. Although these birds likely still nest in these structures (Cink and Collin, 2002), houses and other buildings with large chimneys have now been suggested as preferred nesting sites, and reports of chimney swifts gathering in great numbers in communities in the early 1900s suggest that houses with large chimneys aided population numbers (Erskine, 1992). Food in the form of insects are taken while in flight over mostly open ground and above ponds, lakes, and housing developments.

Distribution:

Chimney swifts were widely reported in Nova Scotia in the late 1980s. However, it was thought that the species was in decline due to the use of insecticides for spruce budworm control, the shift from coal to electric or oil heating and the related loss of large urban chimneys, and the projected decrease in large trees in forested areas (Erskine 1992). Researchers recorded chimney swifts at five locations during bird surveys along the east and west branches of the Medway River within the Medway District during 1997-1998, but none were noted in subsequent survey efforts (Lavers and Staicer, 2009). However, Maritimes Breeding Bird Atlas surveyors have documented possible to confirmed breeding by swifts within and around the District (Appendix 4).

High Conservation Value Identified:

While habitat has played a role in the decline of swifts and other insectivorous birds other factors including availability of food resources, migratory mortality rates and factors on the wintering grounds are key (Fitzgerald et al. 2014).

Large snags that provide nesting opportunities in either hollow spaces or cavities are considered HCV for chimney swift (Zanchetta et al. 2014). No caves are currently known to exist within the Medway District, but such features will be evaluated for HCV if they are discovered.

Management Strategy

Large snags will develop under natural conditions and be maintained within protected areas and old growth forests.

No forest operations are scheduled for the proposed Medway Lakes Wilderness Area pending the completion of the protected areas plan.

In addition to Provincial regulations that require wildlife clump retention (and encouraging contractors to locate these wildlife clumps around snag trees), eight additional snag/cavity trees per hectare will be retained in mosaic harvests with a preference given to poplar, birch, and maple followed by pine, hemlock, and spruce.

No harvesting within special management zones (SMZs) on either side of watercourses ≥ 50 cm wide enabling trees within that 40-60 metre total width zone to develop naturally (grow older and bigger without any human disturbance).

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Common Nighthawk:

Forest Requirements:

Nesting sites for common nighthawk (*Chordeiles minor*) can be found in natural clearings, or in harvested and/or burned forest sites (Poulin et al., 1996). Young stands within the Medway District can likely support nesting nighthawk until the lower branches of saplings begin to touch and close off flight access to the forest floor (age 20-25 years). Birds feed in flight on insects over water and forest canopy.

Distribution:

Erskine (1992) reported nighthawks in most of western Nova Scotia, and researchers recorded nighthawks in Luxton's Meadow adjacent to the Medway District, as well as in a young, regenerating conifer stand along the west branch of the Medway River in 1997-1998 (Lavers and Staicer, 2009). However, Breeding Bird Surveys in North America have documented a downward trend in nighthawk numbers throughout the bird's range (Poulin et al., 1996).

High Conservation Value Identified:

Open forest and regenerating cutovers up to 20 years old are designated as HCV for common nighthawk. No structural requirements are identified for foraging nighthawk as the bird will feed aerially wherever insects are plentiful.

Management Strategy:

Common nighthawk has been selected as one of three species for which habitat objectives have been set within the Medway District. This includes no decline in high value habitat for common nighthawk over the next 100 years. Therefore, wood supply modelling incorporates a constraint on the amount of high-quality forest structure (regenerating forest) throughout the 100-year planning horizon that must be available for use by common nighthawk. This objective will be evaluated every five years and the spatial pattern of favourable forest structure examined. Retention of snag/cavity trees are required in mosaic harvest sites for chimney swift habitat. While these trees are not favourable for nesting nighthawks, openings created during the harvests should provide nighthawk nesting areas.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations. Awareness by workers carrying out pre-commercial thinning is critical, as this activity is most likely to disturb nesting nighthawks in the Medway District.

Peregrine Falcon

Forest Requirements:

The peregrine falcon (*Falco peregrinus*) is not typically associated with forest habitats, but does prey on forest birds to some extent. Peregrines are associated with high cliffs (nesting sites) and they usually prey on other birds in flight. However, they will sometimes hunt from the ground for rodents and nesting birds, but this is rare (White et al., 2002).

Distribution:

Historically, peregrines were uncommon breeders in the Maritimes and disappeared altogether in the 1960s (Erskine, 1992). They were reintroduced beginning in 1982 and now cliffs along the Bay of Fundy support nine known nesting pairs (MTRI, 2008). A pair of falcons were observed in flight in the northeast portion of the Medway District southeast of Carter Lake in 2007.

High Conservation Value Identified:

The primary landscape structural element for falcons is high cliffs upon which the bird can nest. The Medway District does not contain any high cliffs or other suitable nesting sites and therefore no HCV is recognized for peregrine falcon.

Management Strategy:

No specific management strategy is required for the peregrine falcon, however contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Rusty Blackbird

Forest Requirements:

The Rusty blackbird (*Euphagus carolinus*) is found in wet coniferous or mixed wood forests that have cool spruce bogs, swamps, and alder swales. They may also frequent swampy shores adjacent to streams and lakes (Erskine, 1992; Avery, 1995). Nests are built near water in living and dead trees and even in shrubs or on stumps. These birds will nest in spruce, fir, willow, alder, tamarack, birch, and other species. Nesting sites are usually dense and thick with underbrush and tree branches. Food consists of aquatic insects gleaned from the edge of ponds or open bogs, logs in the water, or from direct wading. Rusty blackbirds will infrequently attack and kill other small birds for food (Erskine, 1992; Avery, 1995).

Distribution:

Although difficult to survey because of the forest structure they frequent, rusty blackbirds have still been documented in all regions of Nova Scotia – but they are not common. Records from the 1980s suggest that rusty blackbirds were found in the Medway District (Erskine, 1992), and this is also reported by the Atlantic Canada Conservation Data Centre (ACCDC). Nesting birds were also documented in 2005-2006 in the District just north of Kejimikujik National Park (Ackerman, 2007).

High Conservation Value Identified:

Rusty blackbirds require trees and dense foliage to nest in that are adjacent to wet areas. Any wet, open area with vertical structure on the periphery is considered an HCV for this bird. In the Medway District this includes bogs, treed fens, lakeshore wetlands, seasonally flooded flats, rivers, and streams.

Management Strategy:

A SMZ will be applied to the edges of treed fens, lakeshore wetlands, seasonally flooded flats, rivers, and streams. In addition, Wetland Conservation Policy and related special management practices will provide habitat protection for rusty blackbird.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine

operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Canada Warbler

Forest Requirements:

Canada warbler (*Cardellina canadensis*) can be found in a wide range of forest conditions. Although it favours moist, mixedwood forests, it also occurs in riparian shrub forest, slopes and ravines, in stands regenerating after natural and anthropogenic disturbance, and in old-growth forests with canopy openings and a well-developed shrub layer.

Distribution:

Canada warbler is found in the Medway District and across Nova Scotia (Appendix 3), but there has been a wide-spread decline in numbers the cause of which is not fully understood.

High Conservation Value Identified:

No specific HCV areas have been identified for Canada warbler, but moist mixedwood forest, riparian shrub forest, and old growth forest are recognized as important habitat types.

Management Strategies:

The Province's Old Forest Policy, protected areas, and SMZs along watercourses all contribute to the maintaining Canada warbler habitat.

NSDNR will continue to cooperate with MTRI and Dalhousie University on songbird research that will enhance management of forest songbirds in the Medway District.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Olive-sided Flycatcher

Forest Requirements:

Olive-sided flycatcher occupy early post-fire landscapes or clearings, and like to perch on the tops of tall trees or snags, from which they take off to catch flying insects. They seem to prefer coniferous forest edges, and openings like meadows, rivers, bogs, swamps, and ponds, including young forests following a forest fire, or clearcut (Doucette and Miller, 2015).

Distribution:

Olive-sided flycatchers are often associated with sparse canopy cover and it therefore has been suggested that they may respond positively to forest management. Abundance is greater in early to mid-successional forests. Although the decline and at risk status of this species is not understood, it is not thought to be due to habitat quantity or quality factors.

High Conservation Value Identified:

No specific HCV areas have been identified for olive-sided flycatcher, however mid-successional forest, wetlands and other natural openings are important for this species.

Management Strategies:

SMZ contribute to maintaining olive-sided flycatcher habitat.

NSDNR will continue to cooperate with MTRI and Dalhousie University on songbird research that will enhance management of forest songbirds in the Medway District.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Eastern Wood Pewee

Forest Requirements:

The eastern wood-pewee (*Contopus virens*) is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation. It is also associated with the mid-canopy layer of forest clearings and edges of deciduous and mixedwood forests.

Distribution:

Eastern wood-pewee is found in the Medway District and across Nova Scotia (Appendix 3), but there has been a wide-spread decline in numbers the cause of which is not fully understood.

High Conservation Value Identified:

No specific HCV areas have been identified for the eastern wood-pewee.

Management Strategies:

SMZs related to Provincial Wildlife Habitat and Watercourse Protection Regulations contribute to maintaining eastern wood-pewee habitat.

NSDNR will continue to cooperate with MTRI and Dalhousie University on songbird research that will enhance management of forest songbirds in the Medway District.

Contractors and NSDNR will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

http://www.registrellep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Eastern%20Wood-pewee_2013_e.pdf

Bank Swallow

Forest Requirements:

The bank swallow (*Riparia riparia*) breeds in a variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Foraging is primarily in open areas and wetlands, so forests are not directly required.

Distribution:

Bank swallows are found in the Medway District and across Nova Scotia (Appendix 3), but there has been a wide-spread decline in numbers the cause of which is not fully understood.

High Conservation Value Identified:

HCV areas for barn swallows include vertical banks in sand and gravel pits, road cuts, and stock piles of soils.

Management Strategies:

Forestry activities, including road building and maintenance, will avoid bank swallow breeding sites during the breeding season from April to mid-August.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

http://www.registrellep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_hirondelle_rivage_bank_swallow_1213_e.pdf

Barn Swallow

Forest Requirements:

The barn swallow (*Hirundo rustica*) does not directly depend on forest habitat for breeding or foraging.

Distribution:

Barn swallows are found in the Medway District and across Nova Scotia (Appendix 3), but there has been a wide-spread decline in numbers the cause of which is not fully understood.

High Conservation Value Identified:

The barn swallow likely uses buildings and bridges as breeding sites, but specific HVC areas have been identified.

Management Strategies:

No specific management strategy is required for barn swallows, however contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf

Monarch Butterfly

Forest Requirements:

Monarch butterflies (*Danaus plexippus*) can be found wherever wildflowers thrive, including open fields, meadows, and roadsides. Milkweed is the preferred plant on which the species feeds and lays eggs (MTRI, 2008).

Distribution:

Monarch butterflies can be found in any part of Nova Scotia.

High Conservation Value Identified:

No forest structure is integral for Monarch survival and the species is generally found in open areas or along roadsides. Non-treed areas are not disturbed during forest operations, so no HCV area has been identified for Monarch butterflies.

Management Strategy:

No specific strategy is needed at this time.

Blanding's Turtle

Forest Requirements:

Blanding's turtle (*Emydoidea blandingii*) is found in shallow water lakes, ponds, marshes, and bogs that contain submergent vegetation. Beaver ponds often create preferred conditions for Blanding's turtles (The Blanding's Turtle Recovery Team, 2003). Nest sites can be found up to 500m away from water in a variety of loose substrates associated with road edges, landings, or open fields.

Distribution:

Research has determined that three meta-populations of Blanding's turtles exist in western Nova Scotia loosely centered in Kejimkujik National Park, McGowan Lake, and the community of Pleasant River (Figure 5). The previous Medway landowner, Bowater Mersey Paper Company Ltd., designated 104 ha of land adjacent to McGowan Lake and two feeder streams as a Unique Area and forest operations were prohibited. Land (296 ha) surrounding and including this Unique Area was sold to the Province in 2007.

Blanding's turtles in the McGowan Lake system are located less than 1 km from crown land on the southern edge of the District and could be assumed to be moving up the Medway River system into the Medway District. An unmarked male turtle was discovered in August, 2009 on crown land in the southern most end of the District (Amanda Lavers pers. comm., 2009). However, no turtles were captured in a recent trapping effort on East Stoney Lake in the Medway River system (Lavers and Staicer, 2009).

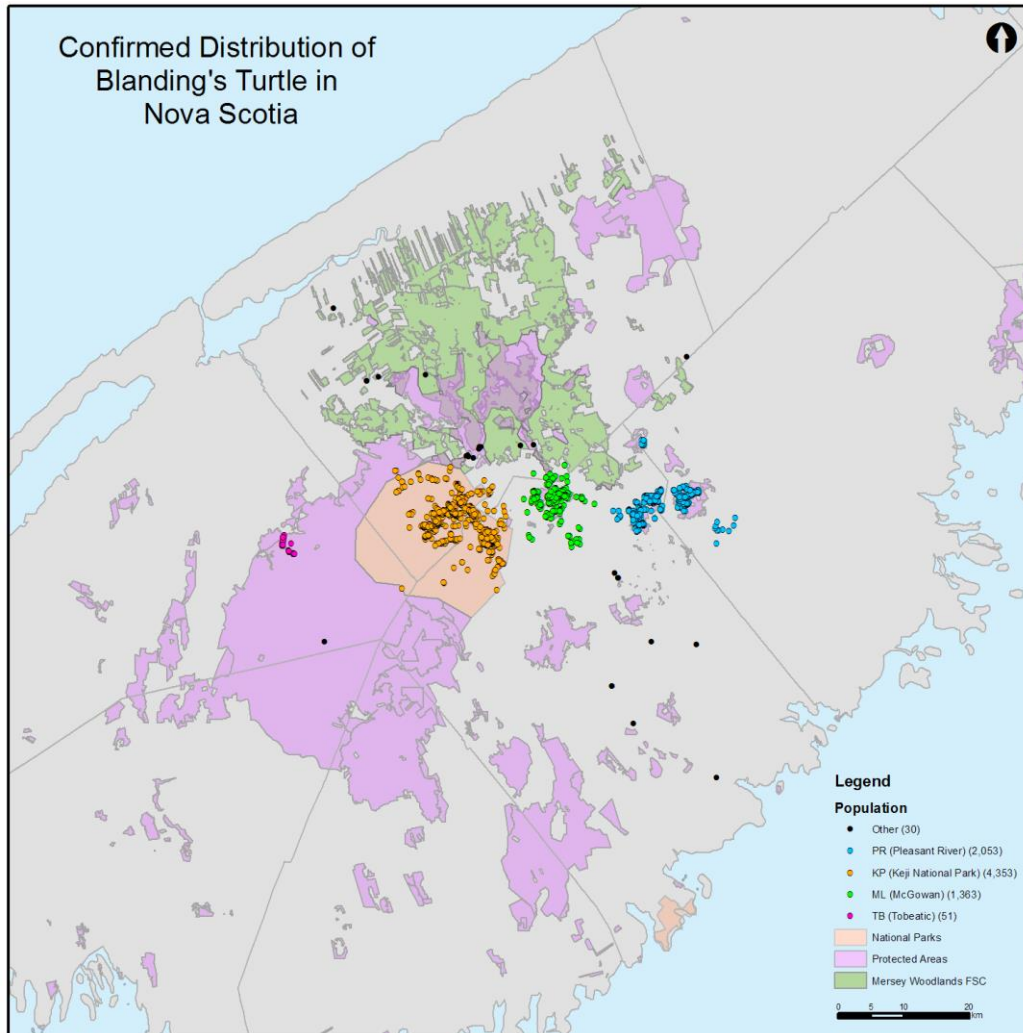


Figure 5. Records for Blanding’s turtle observations in western Nova Scotia. Different coloured dots show different sub-populations of turtles determined with genetic analysis (except black dots not assigned to any d sub-population). The Medway District is shown in green and protected areas in purple and pink. The legend shows, in parentheses, the number of observations for each group. Data were acquired from the ACCDC database up to December 2014.

High Conservation Value Identified:

All lakes, ponds, marshes, and bogs are HCV areas for Blanding’s turtles in the Mersey and Medway watersheds. Since Blanding’s turtles will use river systems to travel, any open water in these watersheds should be included in this assignment.

Management Strategy:

NSDNR will continue to be involved in the Blanding’s Turtle / Eastern Ribbonsnake Recovery Team. Management advice and recommendations from the Recovery Team will be assessed and

implemented wherever possible. NSDNR will also continue to support Blanding's turtle research and field surveys.

Harvesting adjacent to watercourses ≥ 50 cm and wetlands with open water will be buffered with SMZs.

Where road construction activities must cross a watercourse, all terms of the license holder's approval permit from Nova Scotia Environment will be respected.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Wood Turtle

Forest Requirements:

Wood turtles (*Glyptemys insculpta*) are similar to Blanding's turtles in that they are semi-aquatic and most often found in riparian areas and floodplains. Requisite structural elements include water (stream or river), a sandy substrate for nesting, and forest. Wood turtles in summer may use either wet-mesic forested floodplains or riparian areas and tend to be found in dense undergrowth when feeding and open sites when basking.

Wood turtles are rarely found more than 300m from water (MacGregor and Elderkin, 2003; COSEWIC, 2007).

Distribution:

Although found throughout most of the Nova Scotia, wood turtle range does not extend much further west than the eastern portion of the Medway District, and even in the Medway watershed, fewer than five wood turtle records are known (MacGregor and Elderkin, 2003; COSEWIC, 2007) (Figure 6).

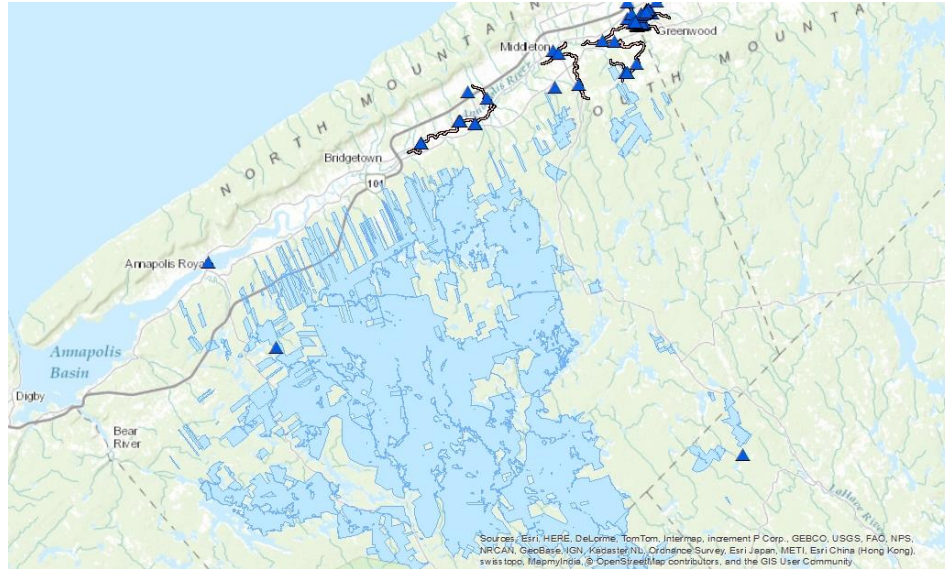


Figure 6. Known occurrences of wood turtle in relation to the Medway District. Blue triangles indicate wood turtles, the Medway District is shaded in light blue.

High Conservation Value Identified:

Much survey effort for turtles and snakes in aquatic habitat has resulted in few records of wood turtles in the Medway District. HCVs have already been designated for Blanding’s turtle and ribbonsnake, species that use many of the same structural landscape features as wood turtle. Therefore, no additional HCV is necessary for wood turtle at this time. However, this will be re-evaluated if greater numbers of this species are discovered in future surveys.

Management Strategy:

No specific management strategy will be developed and implemented for wood turtles in the Medway District. However, surveys for aquatic species at risk are on-going and will continue to be supported by NSDNR in collaboration with partners.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

If needed, the special management practice for forestry planning and operations related to wood turtles can be found at: <http://novascotia.ca/natr/wildlife/habitats/terrestrial/>

Eastern Ribbonsnake

Forest Requirements

The eastern ribbonsnake (*Thamnophis sauritus*) is semi-aquatic and lives in shallow wetlands or along stream and river edges. It is often found in association with Blanding's turtles at wetland edges where low surrounding vegetation provides cover. Adult female and juvenile snakes may infrequently be found in upland areas away from wetlands (Smith, 2002).

Distribution

The Mersey, Medway, and LaHave watersheds in southern Nova Scotia are the only known locations of eastern ribbonsnake in the province (Figure 7).

No snakes have been observed within the Medway District, but presence has been recorded in Dean Lake and Tupper Lake adjacent to the southern edge of the District.

High Conservation Value Identified

As a result of the overlap in habitat preferred by eastern ribbonsnake and Blanding's turtle, HCV areas declared for Blanding's turtle will suffice for eastern ribbonsnake. Therefore, all lakes, ponds, marshes, and bogs in the Mersey and Medway watersheds are also assigned HCV for eastern ribbonsnake.

Management Strategy

NSDNR will continue to lead the Blanding's Turtle / Eastern Ribbonsnake Recovery Team. Management advice and recommendations from the Recovery Team will be assessed and implemented wherever possible.

Harvesting adjacent to watercourses ≥ 50 cm and wetlands with open water will be buffered with SMZs.

Where road construction activities must cross a watercourse, all terms of the license holder's approval permit from Nova Scotia Environment will be respected.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

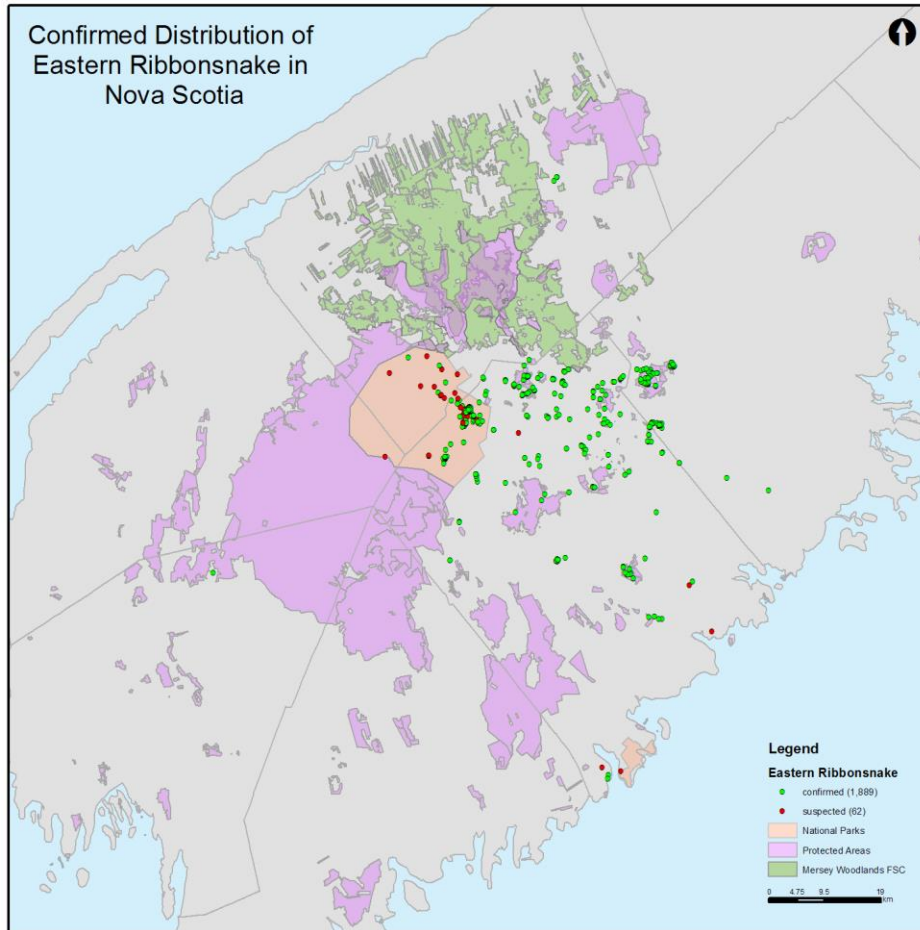


Figure 7. Records and distribution of eastern ribbonsnake in Nova Scotia. Confirmed and suspected locations are indicated. The Medway District is shown in green and protected areas in purple and pink.

Snapping Turtle

The snapping turtle (*Chelydra serpentina*) is the largest turtle in Canada and can reach 40cm in length. It is readily distinguished by its long tail and long neck. Snapping turtles have been observed in the shallow waters of almost every kind of freshwater habitat, however, the preferred habitat is slow-moving water with a soft mud bottom and dense aquatic vegetation. Like other turtles, snapping turtles nest on gravel/sand surfaces along or on roads, gravel pits, etc.

http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1033.

Distribution:

Snapping turtle can be found across Nova Scotia.

High Conservation Value Identified:

For snapping turtle the HCV is general and encompasses ponds, lakes, streams and rivers in both forested and non-forested landscapes.

Management Strategy:

Avoidance of turtles and turtle nests encountered during forest harvest operations.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Atlantic Salmon

Forest Requirement:

Atlantic salmon (*Salmo salar*) do not directly require forest structure for survival as they live in the ocean as adults and freshwater rivers and streams as parr and smolts. However, forest management activities can impede salmon movement if installation of watercourse crossing structures do not enable fish passage. Water quality may also be affected by operations if transportation of products releases deleterious agents (e.g., sediment or petrochemicals) into freshwater, or if the removal of shade results in an increase in water temperature.

Distribution:

The Inner Bay of Fundy salmon populations listed federally do not spawn in any rivers within the Medway District (COSEWIC, 2006a). However, COSEWIC has recommended that Atlantic salmon in the Southern Uplands ecodistrict be listed as endangered. The nearest river used by this population is the Cornwallis, which empties into the Minas Basin. There were, however, at least eight other rivers that historically supported salmon in the region. The provincial significant habitats database indicates a 2001 record of Atlantic salmon within 200m of the Medway District in the Round Hill River. Round Hill populations should be considered as part of the Southern Uplands salmon population.

High Conservation Value Identified:

The East and West Branches of the Round Hill River, and the River itself, are designated HCV areas for Atlantic salmon. The Round Hill River salmon population should be considered part of the Southern Uplands salmon population.

Management Strategy:

The Round Hill, East Branch Round Hill, and West Branch Round Hill Rivers, plus any tributaries exceeding 50cm in width, will be assigned a SMZ during forest management activities.

Where road construction activities must cross a watercourse, all terms of the license holder's approval permit from Nova Scotia Environment will be respected.

Black Ash

Forest Requirements:

In Nova Scotia, black ash (*Fraxinus nigra*) is usually found in poorly drained riparian areas along swampy woodland stream and river banks.

Distribution:

Black ash is rare in Nova Scotia and only about 12 mature breeding trees are known. Most of the known population (about 1,000) are small and non-breeding. Black ash is not currently known to be in the Medway District (Figure 8).

High Conservation Values Identified:

No specific HCV areas have been identified for black ash, but wet mixedwood and hardwood swamps along streams and rivers may be suitable habitat.

Management Strategies:

If black ash is discovered in the Medway District, best management practices will be identified by NSDNR. A Recovery Strategy currently in Draft form (Hurlburt 2015) will provide guidance and best management practices. Protected areas could provide some protection for black ash and their habitat.

Priority potential habitats will be surveyed for black ash by NSDNR.

Current protected areas could also provide some protection for black ash habitat. Staff and contractors will receive species at risk training and awareness and are asked to report sightings to NSDNR staff. All forest harvesting operators are to have access to a species at risk field card on-site of their operations (Appendix 1).

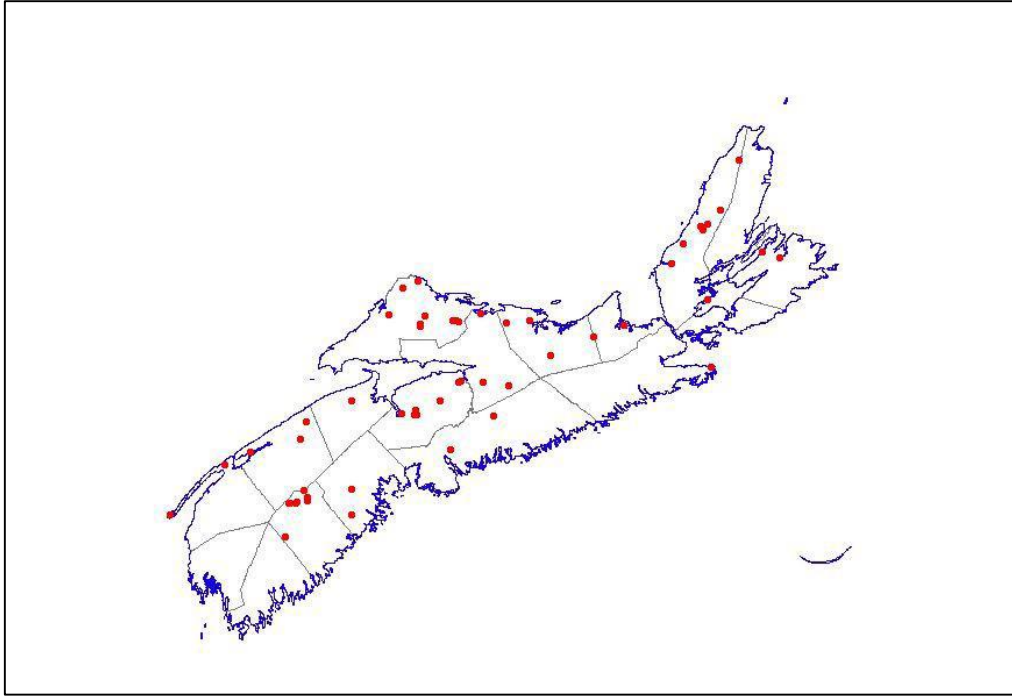


Figure 8: Distribution of black ash in Nova Scotia (includes only records for which coordinates were available) (Hurlburt, 2010).

Eastern White Cedar

Forest Requirements:

Eastern white cedar (*Thuja plicata*) is associated with cool, moist, nutrient-rich sites that are often adjacent to streams or wet landscape features. When found in upland areas, it generally indicates a wet area, calcareous parent material, or old field conditions. Eastern white cedar grows from sea-level to 600 m elevations. It flourishes in rich swamps with an abundant flow of mineral-rich water (Burns and Honkala, 1990).

Distribution:

Tree species most commonly associated with cedar are balsam fir and tamarack (larch), but it can also be found with black spruce, white spruce, red spruce, black ash, and red maple on swampy sites (Burns and Honkala, 1990). In Nova Scotia cedar is known to occur at 32 different sites found in Yarmouth, Digby, Annapolis, Kings, and Cumberland Counties (Newall, 2005) (Figure 9). Approximately 12,000 total mature trees are estimated to populate these sites. No live trees are currently known to be in the Medway District (a single tree identified in 2009 has since blown down). A cedar was found in the Goldsmith Lake area of Medway District (2015).

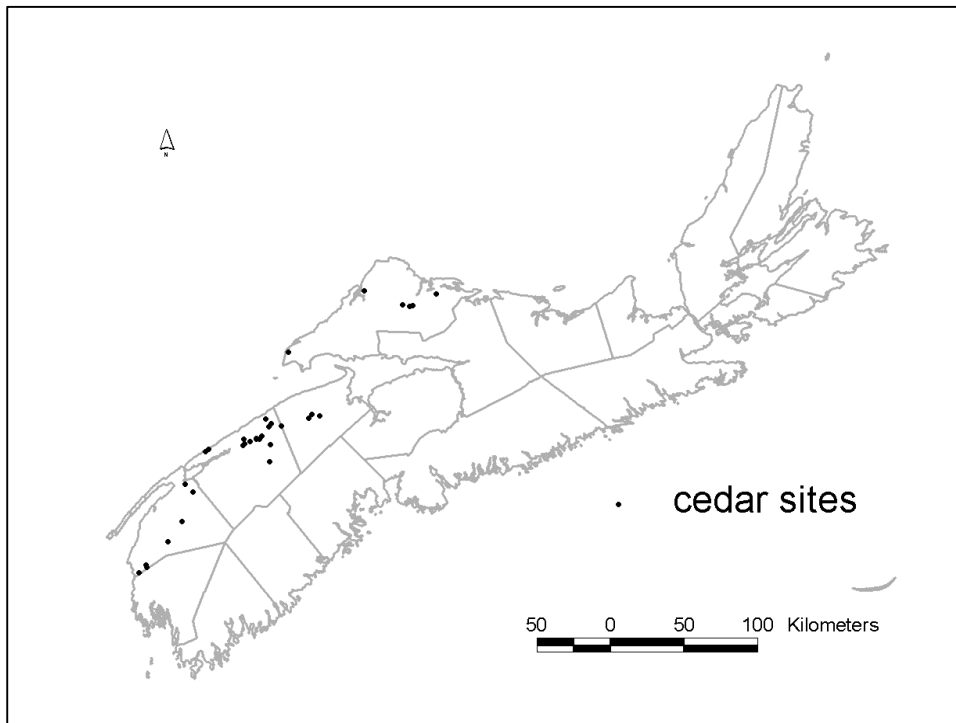


Figure 9. Distribution of Eastern white cedar in Nova Scotia (Newell, 2007).

High Conservation Value Identified:

Considering the limited number of cedar in western Nova Scotia and the lack of known locations in the Medway District, an HCV designation related to cedar is not needed at this time. This will be re-evaluated if cedar stands are discovered in the District.

Management Strategy:

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

If cedar is located, the required buffer between management activities and the tree(s) will be determined by NSDNR staff.

Rockrose

Forest Requirements:

A perennial herb, rockrose (*Helianthemum canadense*) is most often found in open, sandy barrens where minimal competition from other woody species occurs. Rockrose was recently located (2006) in Greenfield, Queens County, in small openings with an overstory of white pine. Disturbance is required for proliferation as the species is very shade intolerant (Newell, 2007).

Distribution:

Until recently, rockrose was known to occur in only three communities in the Annapolis Valley of Nova Scotia (Kingston, Green Acres, and Greenwood), but an historic population near Greenfield was rediscovered in 2006 (Newell, 2007). The ACCDC reports no observations of rockrose in the Medway District.

High Conservation Value Identified:

As a result of the species' general dependence on open, sandy barrens with no forest cover (exception being the Greenfield population), and with no historic populations known in the Medway area, no HCV has been assigned for rockrose in the Medway District.

Management Strategy:

No management strategy is necessary for rockrose at this time. This will be re-evaluated if rockrose is found within the District in future.

Prototype Quillwort

Forest Requirements:

Prototype quillwort (*Isoetes prototypus*) is a perennial aquatic plant found only in cold, spring-fed nutrient poor lakes. It is not found on land out of water (COSEWIC, 2005).

Distribution:

Only two lakes in the Annapolis Valley are known to support this species. There are no known occurrences within the Medway District and COSEWIC (2005) reports no sightings from surveys of inland lakes in Annapolis County.

High Conservation Value Identified:

No HCV is needed for prototype quillwort at this time.

Management Strategy:

No management strategy for prototype quillwort is required in the Medway District.

Atlantic Coastal Plain Flora

pink coreopsis (*Coreopsis rosea*), plymouth gentian (*Sabatia kennedyana*), eastern mountain avens (*Geum peckii*), thread-leaved sundew (*Drosera filiformis*), tall beakrush (*Rhynchospora macrostachya*), golden crest (*Lophiola aurea*), tubercled spikerush (*Eleocharis tuberculosa*), water-pennywort (*Hydrocotyle umbellata*), eastern lilaopsis (*Lilaeopsis chinensis*), redroot (*Lachnanthes caroliniana*), Long's bulrush (*Scirpus longii*), New Jersey rush (*Juncus caesariensis*), sweet pepperbush (*Clethra alnifolia*)

For the purpose of this report, the above listed species will be addressed in the following sections as Atlantic Coastal Plain Flora (ACPF). ACPF encompasses a suite of about 90 species of primarily wetland plants that share southern affinity with the Atlantic Coastal Plain. They include 10 species that are at risk nationally and provincially. These species are considered a "species at risk" priority for Canada. Recovery efforts take a multi-species ecosystem approach (The Atlantic Coastal Plains Flora Recovery Team, 2004).

Forest Requirements:

ACPF include small, slow-growing herbaceous plants, grasses, sedges, and shrubs found in and around wetlands or along shorelines of lakes, rivers, bogs, and fens. A few species can also be found at the forest/ shore interface.

Water-pennywort is found on gravelly lakeshores above and below the water line. Redroot is most often found on cobble beaches. Long's bulrush prefers peat wetlands with little competition from woody plants, and sweet pepperbush has been found on unshaded lake edges (The Atlantic Coastal Plain Flora Team, 2004).

Distribution:

The complex of ACPF species is found primarily in western Nova Scotia and in southern Cape Breton. Individually, species have been assigned high priority by the ACPF Recovery Team. None of these species at risk are known to occur in the Medway District, but sweet pepperbush has been found within 0.5km (at Pretty Mary Lake) (The Atlantic Coastal Plain Flora Team, 2004). Botanical surveys of the shorelines of East Stoney Lake and Eleven Mile Lake in September, 2009 did not report any ACPF species (ACCDC, 2009).

High Conservation Value Identified:

Considering the habitat distribution of ACPF species in western Nova Scotia, riparian zones adjacent to priority lakes, rivers, fens, and other habitats (see ACPF Recovery Strategy) have been designated HCV for ACPF species in the Medway District. Note that treed/shrub bogs and shrub

swamps are not included as HCV area since the presence of ACPF species are unlikely in these habitats.

Management Strategy:

All lakes, rivers, and fens will be assigned a SMZ for forestry related operations to prevent disturbance of potential ACPF species.

Best management practices for ACPF will be employed in areas indicated in Figure 10.

NSDNR will continue to support annual botanical surveys in the Medway District by the MTRI and ACCDC and results will be evaluated for HCV.

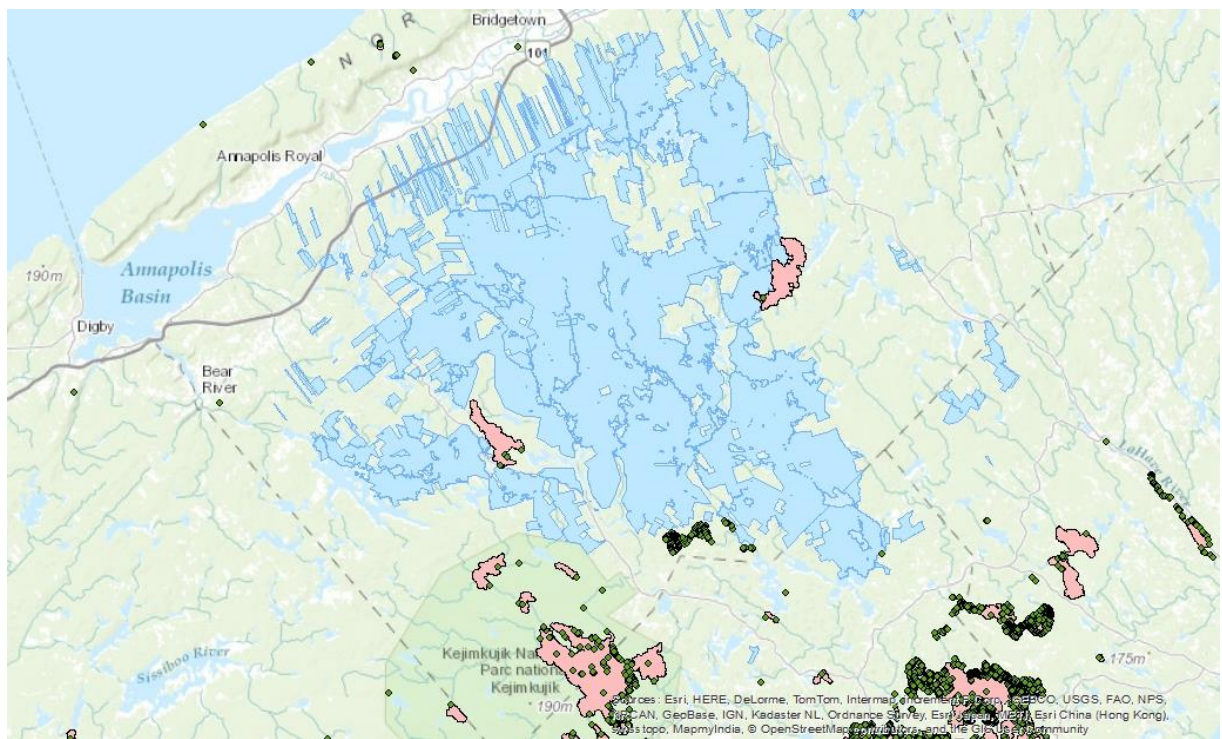


Figure 10. Map of the Medway District (blue) showing known locations of ACPF species at risk and species of conservation concern (green points) based on ACCDC data to December, 2014. Areas buffered under the SMP for ACPF are indicated in pink.

Boreal Felt Lichen

Forest Requirements:

Boreal felt lichen (*Erioderma pedicellatum*) is found predominately on the lower trunk or branches of balsam fir trees in mature coniferous forest stands. The species has most often been found on northerly slopes where wet, moist microclimatic conditions prevail. There is often a

general habitat association with sphagnum mosses as a result of the microclimatic conditions required (Maass and Yetman, 2002).

Distribution:

Historically, occurrences of boreal felt lichen have not been more than 30km inland from the Atlantic coast of Nova Scotia. Its post-1995 distribution has shrunk to only Halifax and Guysborough Counties, but there have since been further finds in Lunenburg County and on Cape Breton Island (Frances Anderson pers. comm., 2009). The distribution of known locations of boreal felt lichen is shown in Figure 11.

Between November 2005 and January 2006, five day-long surveys for boreal felt lichen were carried out in the Medway District (Anderson, 2006). Survey sites were selected using the following algorithm: forest stands less than 25km from the coast, comprised of greater than 70 percent balsam fir, and within 50m of a bog or fen (Rob Cameron pers. comm., 2005). Of 10 sites greater than 2 ha in size selected in the Medway District, five sites nearest the Bay of Fundy were surveyed. No boreal felt lichen was observed, nor was any *Coccocarpia palmicola* found – a cyanolichen always associated with boreal felt lichen in Nova Scotia (Maass and Yetman, 2002).

High Conservation Value Identified:

NSDNR has defined attributes of forest where boreal felt lichen is likely to occur as stands in which balsam fir is listed as a primary or secondary species and which occur within 80m of a mapped peatland (bog or fen) within NSDNR's GIS wetlands layer. The model further confines the search to only those forest stands located within 30km of the Atlantic coast. Forests meeting these criteria would be considered of high conservation value, but none occur in the Medway District.

Management Strategy:

No specific management strategy is required for boreal felt lichen, however contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

The Special Management Practice (SMP) for potential boreal felt lichen habitat can be found at:

http://novascotia.ca/natr/wildlife/habitats/terrestrial/pdf/SMP_Boreal_Felt_Lichen.pdf

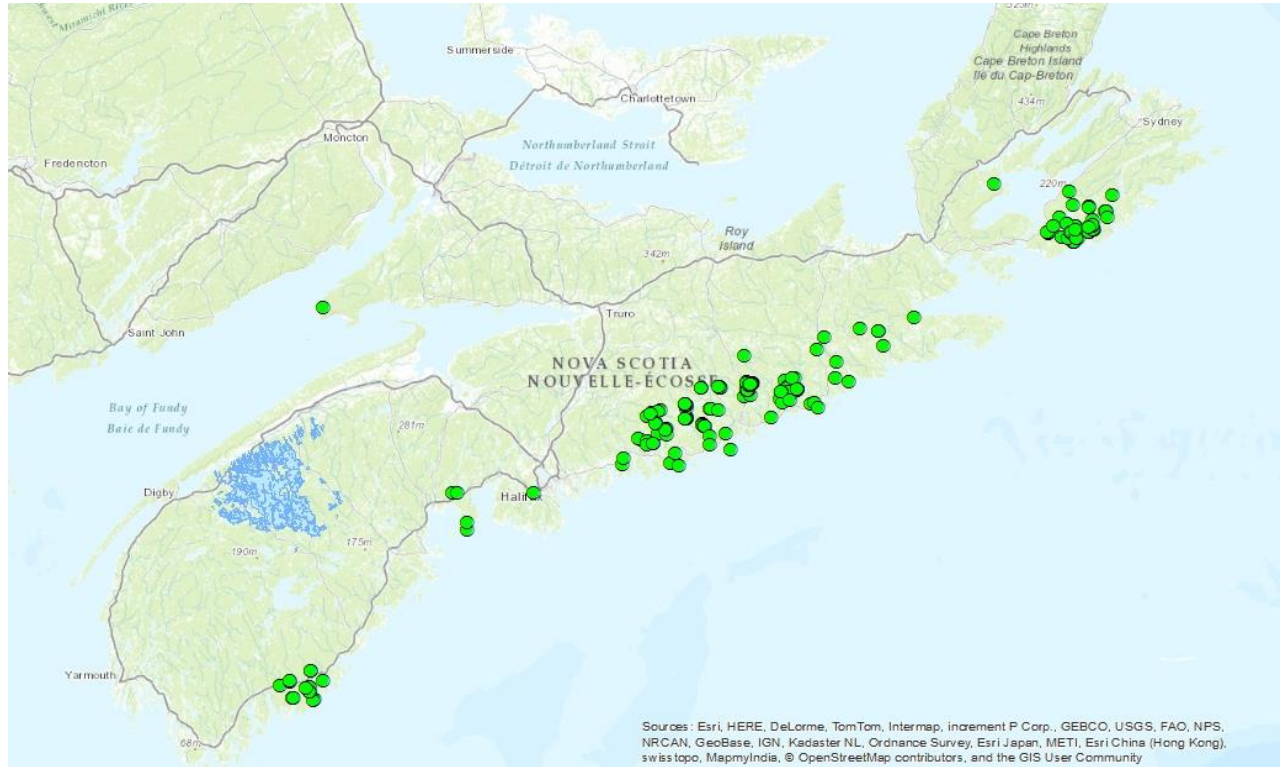


Figure 11: Map of Nova Scotia showing the current known distribution of boreal felt lichen (green circles) in relation to the Medway District (blue).

Vole Ears Lichen, Eastern Waterfan, Blue Felt Lichen, and Frosted Glass-whiskers

Forest requirements:

These lichens are all forest dependent. Even Eastern waterfan which occurs in streams is forest dependent as it is sensitive to habitat alteration including those tied to forestry activities. These species all depend on humid forest condition and suitable tree, or stream, substrate.

Distribution:

Currently, none of these lichens have been found in the Medway District. Some targeted surveys have been conducted (see boreal felt lichen).

High Conservation Value identified:

No HCV has been identified for vole ears lichen (*Erioderma mollissimum*), eastern waterfan (*Peltigera hydrothyria*), blue felt lichen (*Degelia plumbea*), or Frosted glass-whiskers (*Sclerophora peronella*). NSDNR will continue to support field surveys for these lichen species. Priority forest areas will be monitored for lichens and important lichen sites documented when found.

Management Strategy:

If sites for lichen species at risk are found, Special Management Practices (SMPs) similar to those for boreal felt lichen will be employed to protect these sites.

Protected areas, old growth forest areas, and riparian areas will protect lichen habitats in general.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

Little Brown Myotis, Northern Myotis, and Tri-colored Bat:

These three bat species (*Myotis lucifugus*, *Myotis septentrionalis*, *Perimyotis subflavus*) have been assessed as endangered in response to catastrophic declines in numbers due to the fungal cave dwelling pathogen causing White Nose Syndrome. Populations of these bats are thought to have declined by over 90 percent over the past few years. All these species (to some extent) depend on forests for roosting and feeding. In particular northern myotis feeds along forest edges and in gaps in the forest, while the other species commonly feed over or near water. In addition to caves, buildings and trees are used for breeding sites. Bats provide valuable forest related ecosystem services, consuming large numbers of forest insect pests.

Distribution:

In the past these three bats were distributed throughout Nova Scotia, however the tri-colored bat was less common. It is likely that all three species occurred at one time in the Medway Forest District.

High Conservation Value Identified:

Snags and cavity trees are considered HCVs sites High Conservation Value for the three bat species.

Management Strategies:

Given the virtual disappearance of bats from Nova Scotia (and the poor prognosis for recovery), no bat-specific management strategies are recommended at this time. However, maintaining riparian buffers, protected areas, and minimum retention levels (wildlife clumps) as required by Wildlife and Watercourse Protection Regulations will support bat habitat requirements.

In addition to Provincial regulations that require wildlife clump retention (and encouraging contractors to locate these wildlife clumps around snag trees), eight additional snag/cavity trees per hectare will be retained in mosaic harvests with a preference given to poplar, birch, and maple followed by pine, hemlock, and spruce.

Contractors and NSDNR staff will receive species at risk training and are asked to report any sightings to NSDNR for inclusion in the Biodiversity Investigation Report database. Machine operators are also required to have access to a species at risk field card (Appendix 1) when conducting onsite operations.

2. Does the forest contain a globally, nationally, or regionally significant concentration of endemic species?

It is generally thought that the number of endemic species in Nova Scotia is low due, in part, to the impacts of glaciation. Figure 12 illustrates the pattern of endemism for plants in the Atlantic Maritime ecosystem. Only about one to three endemic plant species are suggested for Nova Scotia. Eastern mountain avens is the best documented endemic species in the province and is listed nationally and provincially as an endangered species. In the world this plant is only found in the Digby Neck/Brier Island area of Nova Scotia and in a few mountain alpine areas in New Hampshire.

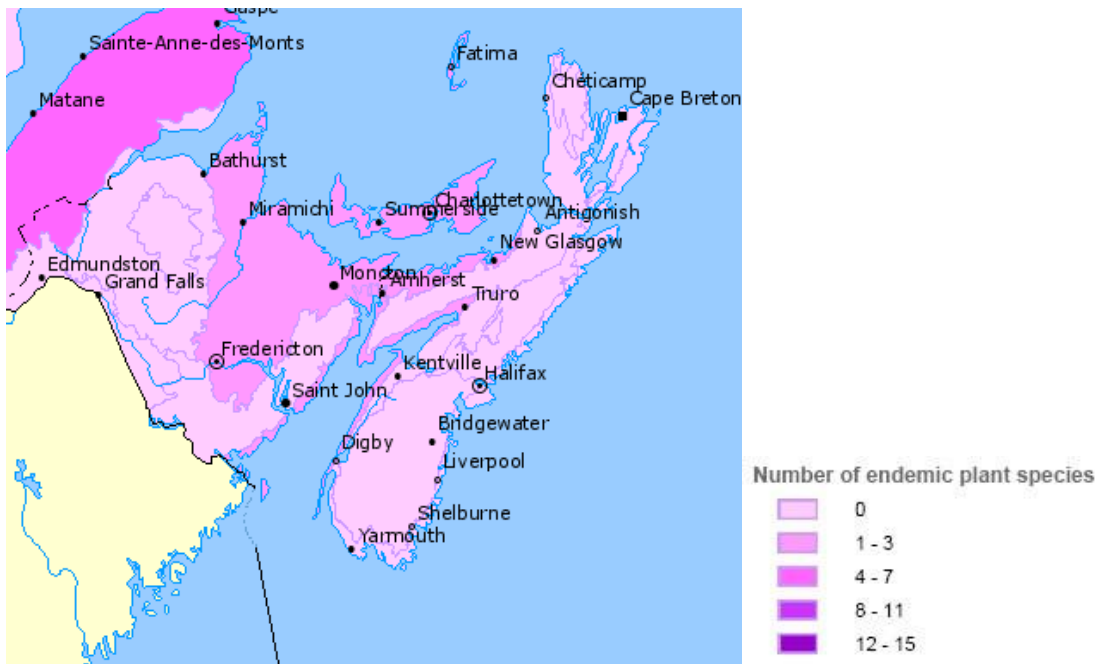


Figure 12. Estimated number of endemic plant species for the Atlantic Maritime ecosystem (Atlas of Canada).

Most of the endemic species occurring in Nova Scotia are insects. On Sable Island, a beetle *Tricholochmaea sablensis* and a sweat bee *Lasioglossum sablense* are known endemics. Sable Island is considered a hotspot for endemism in the region and other endemic species are expected to be found there. There may be more endemic insects in Nova Scotia, but this has yet to be confirmed.

There are three known vertebrate endemic species in Nova Scotia. The endangered Atlantic whitefish (*Coregonus huntsmani*) occurs only in the Petite Riviere watershed of Nova Scotia and is thought to be extirpated from the Tusket River watershed. The maritime shrew (*Sorex maritimensis*) and the Gaspé shrew (*Sorex gaspensis*) are endemic small mammals occurring in maritime Canada, but neither have been found in the Medway District (although there have been no targeted surveys conducted). There are no bird species endemic to Nova Scotia.

In summary, there are currently no endemic species known to be associated with the Medway District.

High Conservation Value Identified:

None currently assigned.

Management Strategy:

None currently required.

3. Does the forest include critical habitat containing globally, nationally, or regionally significant seasonal concentrations of species (one or several species, e.g., concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal, watershed level forests, or riparian forests associated with high value fisheries habitat)?

According to the Canadian Important Bird Areas website, there are no important bird areas located near the Medway District. Most IBAs are located along the coast.¹ Migratory bird sanctuaries are discussed under Question 6, but none are located within or adjacent to the Medway District. Similarly, the Minas Basin is a crucial feeding and resting stop for millions of migratory shorebirds each year, but is not adjacent to the Medway District (KBM, 2009).

In a study on *Odonata* (dragonflies and damselflies) and *Tabanidae* (horseflies and deerflies) diversity in treed bogs, Hurlburt (2009) concluded treed bogs in southwestern Nova Scotia contain many rare and specialized species of odonates and tabanids, some never or rarely reported in the province. Treed bog areas contained 54 species of dragonflies and damselflies, representing 47 percent of Nova Scotia's mainland species. Six of 10 species of Nova Scotia odonates restricted to, or which predominantly occupy bogs, were found in the study sites. Four of these are rare: *Nannothemis bella*, *Nehalennia gracilis*, *Gomphaeschna furcillata*, and *Somatochlora franklini*. Thirty-eight species of horse and deer flies were identified, representing approximately 76 percent of Nova Scotia's species. Three of these are extremely rare throughout their range and are likely part of the disjunct Atlantic Coastal Plain group of species: *Merycomyia whitneyi*, *Chrysops pudicus* and *C. delicatulus*. *Merycomyia whitneyi* is the first record for Nova Scotia, and

¹ IBA Canada Interactive Map Viewer; www.bsc-eoc.org/iba/mapviewer.jsp

the collection of *C. pudicus* is the second location for Nova Scotia and only third reported location in Canada.

Proclaimed by government as Nova Scotia's official fish, regionally significant seasonal concentrations of brook trout (*Salvelinus fontinalis*) occur in the Medway District (EAC, 2009; Lavers and Staicer, 2009; Corbett et al., 2009). Brook trout in the Upper Mersey River system move great distances seasonally to control their body temperature (Corbett et al., 2009). In summer brook trout move into cold water refugia in four lakes (Sandy Bottom, Boot, Gull, and Frog) and two river stretches (Liverpool and West Branch Liverpool) within the Medway District (Reg Baird pers. comm., 2009 in Bowater Mersey Paper Company Ltd., 2010). These areas of the Upper Mersey River system are important for summer survival as numbers of brook trout continue to decline province-wide (Trout Nova Scotia, 2009).

As discussed in Question 1, the Inner Bay of Fundy population of Atlantic salmon is listed federally as endangered, yet COSEWIC (2006a) illustrate no rivers used by this population of salmon extending into the Medway District. As noted, however, a single 2001 record of Atlantic salmon exists from the nearby Round Hill River. Once known as one of the "best rivers in Nova Scotia for salmon" (George Mansfield pers. comm., 2009 in Bowater Mersey Paper Company Ltd., 2010), the Mersey River does not support a run of salmon, and no passage is possible even into Lake Rossignol (well south of the Medway District) because of Nova Scotia Power hydro dams. With the construction of the hydro facility and fish hatchery at McGowan Lake, no salmon are able to migrate up into Medway District.

High Conservation Value Identified:

All treed bogs are designated HCV as a result of research into invertebrates as indicators of bog health and identification of rare and specialized species. Sandy Bottom, Boot, Gull and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers, are designated as HCV for brook trout. As cited in Question 1, Round Hill River and the East and West Branches are noted as HCV for Atlantic salmon.

Management Strategy:

The IRM review process will assess the potential impacts of harvest operations on all wetlands, including treed bogs, and prescribe measures to be taken to maintain their conservation value. Sandy Bottom, Boot, Gull and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers, will have a SMZ during forest management activities. Any watercourse crossing installed over the Liverpool and West Branch Liverpool River systems will be conducted in accordance with provincial regulations.

- 4. Does the forest contain critical habitat for regionally significant species (e.g., species representative of habitat types naturally occurring in the management unit, focal species, species declining regionally, including concentrations of aquatic species whose habitat is dependent on riparian forest or watershed condition)?**

NSDNR has a good system for assessing the status of species at risk. The Province also has an excellent “coarse filter” for assessing the status of thousands of species of plants, vertebrates, invertebrates, and other organisms. This General Status of Wildlife system is nested within a broader National General Status of Wildlife collaboration that, together with involvement and data from the Atlantic Conservation Data Centre (ACDC), provide status and location information for land-use planning, environmental assessments, natural resource use planning, and conservation planning.

For the purpose of this section of the document, we analyzed all the ACCDC records for species that are considered “maybe at risk” or “sensitive” under the General Status of Wildlife process. Records in the general area surrounding the Medway District (5km buffer) were also examined.

Figures 13 and 14 display actual records from the ACCDC for some species at risk, species that may be at risk, and sensitive species.

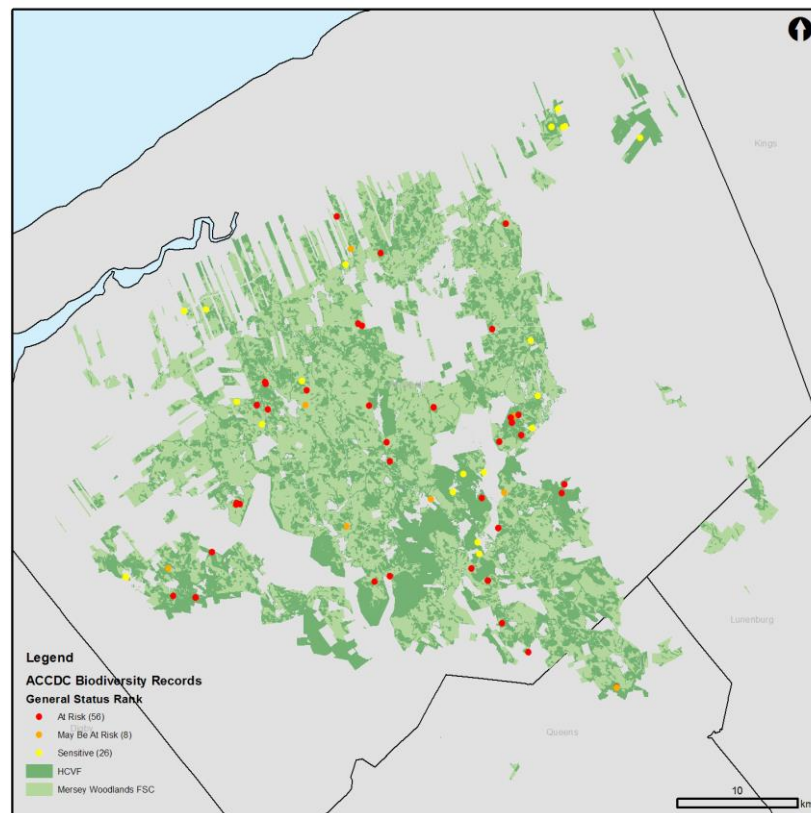


Figure 13. ACCDC records of species with precision greater or equal to 2.0 (i.e., precise to within 100s of meters or better) and General Status ranks of ‘At Risk’, ‘May Be At Risk’, or ‘Sensitive’ within the Medway District.

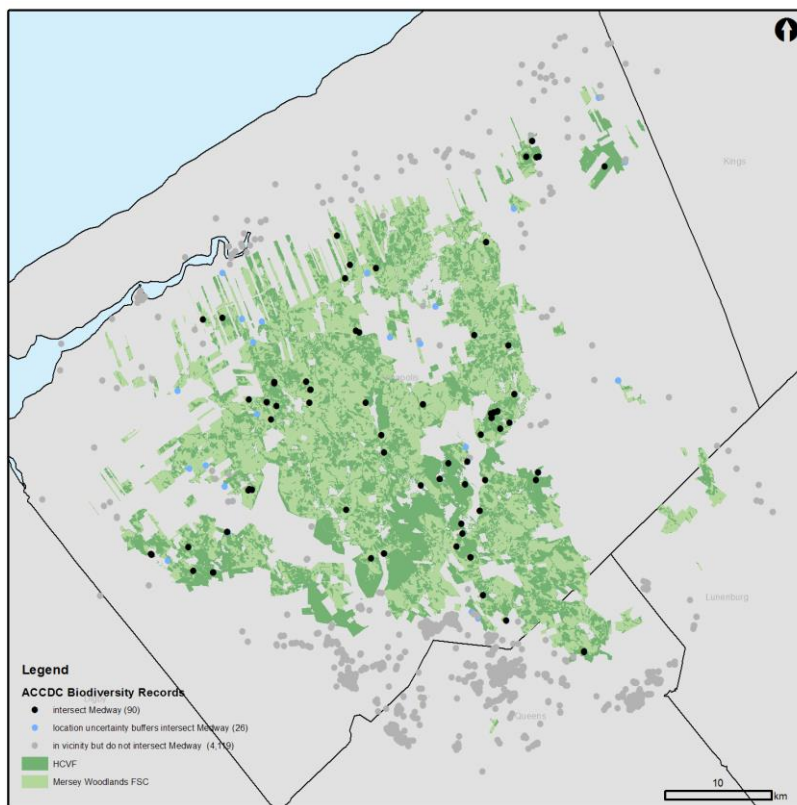


Figure 14. ACCDC records of listed species with precision greater than or equal to 2.0 (i.e., precise to within 100s of meters or better) in or near the Medway District. Black points intersect the Medway District . Blue and grey points are locations within 5 km of the Mersey Woodland ; blue points being those that intersect the Medway District when buffered by their location uncertainty.

Note that most of the records are for formal species at risk and there are fewer records for the other categories. Figure 13 and 14 shows records in the ACCDC database in, outside, and intersecting with the Medway District. The density of records outside the area is higher than the density of records inside, suggesting that our knowledge base for the Medway District is not as good as for the surrounding area. While there have been targeted surveys for priority species inside the Medway District facilitated by the previous owner, there is room for improvement, and possibly more targeted surveys to inform the HCVF process and overall forest management planning in the area.

Appendix 4 lists the 39 species of conservation concern known from the Medway District. The appendix also shows that 10 of these species are known from protected areas. These species represent a wide variety of life histories and habitats most of which have some affiliation with forests. The precision of the data available in the ACCDC varies considerably. Appendix 5 lists the 15 species of conservation concern for which only very precise location data exist within the Medway District. Finally, Appendix 6 summarizes all the records, precise and not precise, for the

Medway District buffered by 5km. This analysis suggests that there may be as many as 62 species of special concern in the Medway District.

High Conservation Values Identified:

Given the wide range of habitat requirements for species of special concern in the Medway District, species-specific HCVs are not identified species by species. Also note, given the diversity of species identified in this group, that forest management activities would not necessarily impact all species.

Management Strategies:

Species-specific management strategies are not feasible. The spatial information for each of the species of conservation concern identified for the Medway District will be provided to NSDNR staff and partners in forest management planning. This information will be incorporated into forest planning and reviewed during the IRM process where appropriate actions will be identified to maintain species habitat.

Protected areas and SMZs will provide protection for some of these species locations.

NSDNR will work with partners to improve the knowledge base for species at risk and species of conservation concern by supporting and conducting surveys that target priority species, habitats, and ecosystem types.

To satisfy Principle 6.3.10 of the FSC Maritimes Standard, wildlife habitat objectives were developed for golden-crowned kinglet, common nighthawk, and American marten. These objectives ensure that adequate forest structure will be available for 100 years and species with similar structural requirements will, by default, be afforded appropriate forest structure as well.

The Wildlife Habitat and Watercourse Protection Regulations (2002) will be used to address habitat issues in a general way, but additional management guidance will be provided as listed above under High Conservation Value Identified. The publication of *the Biodiversity Stewardship Guidebook for Nova Scotia* using the Provincial Forest Ecosystem Classification (FEC) system as a framework is currently under development. This document will supplement the list above and guide forest management in critical habitat for regionally significant species.

The NSDNR Old Forest Policy (2012) will guide Old Growth conservation. A summary of current Old Forest Policy status, HCVF identification, and associated management strategies is detailed under Question 9.

5. Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?

A good portion of the plants and animals native to Nova Scotia have a southern affiliation given the relatively recent retreat of glaciers from the area and subsequent re-colonization by flora and fauna. A number of the plants listed as at risk or of conservation concern have southern affiliations and are dealt with elsewhere in this document.

Atlantic Coastal Plain species are at the northern edge of their range in Nova Scotia. The Atlantic Coastal Plain community is found along the Atlantic coast of the United States, from New Jersey to Florida, and as far south as Mexico. This community is a group of 90 taxonomically unrelated wetland plants, which inhabit lake and river shores, bogs, fens, and estuaries.² These plants are small, slow-growing, and adapted to living in areas that are low in nutrients and subject to disturbance by wind, waves, and changing water levels.³ In addition to being at the edge of its range in Nova Scotia, this community is considered a community at risk, both in Nova Scotia and in the United States.⁴

The Atlantic Coastal Plain community can be considered to occur at locations where several of these species exist together. In the Medway District, this occurs only at Stony Lake, where the zigzag bladderwort (*Utricularia subulata*), low water-milfoil (*Myriophyllum humile*), and southern bog clubmoss (*Lycopodiella appressa*) were observed in 2001 (ACCDC, 2009).

In addition to ACPF, southern flying squirrels (*Glaucomys volans*) are thought to be at the edge of their natural range (Lavers and Staicer, 2009).

White-footed mouse (*Peromyscus leucopus*) is found in eastern North America, but only in three distinct areas in Canada (southern Nova Scotia, southern Ontario, and southern Alberta / Saskatchewan). The nearest range outside of Nova Scotia is southern Maine. This mouse inhabits dry deciduous forest where it lives under logs, stumps, and brush piles and forages for seeds and small insects on the forest floor. It is a prolific breeder and has an average life span of only four and one-half months. Commonly, a complete generation of mice is turned over annually (Banfield, 1974).

High Conservation Value Identified:

As identified for ACPF in Question 1, riparian zones adjacent to priority lakes, rivers, fens, and other habitats (see ACPF Recovery Strategy) have been designated HCV for ACPF species in the Medway District. Old forest and legacy trees left after harvest are designated HCV for southern flying squirrel.

Management Strategy:

Maintain SMZ on all lakes, rivers, and fens during forest operations to prevent disturbance of ACPF species.

² Nova Scotia's Coastal Plain Flora; www.speciesatrisk.ca/coastalplainflora/about.htm

³ Nova Scotia's Coastal Plain Flora; as cited above

⁴ Canadian Intergovernmental Conference Secretariat, Atlantic Coastal Plain Species at Risk Fact Sheet; www.scics.gc.ca/pdf/83076106_e.pdf

Retention of individual snag/cavity trees in mosaic harvests with a preference for poplar, birch, and maple and secondarily pine, hemlock, and spruce trees (8 snag trees per ha to be retained in addition to required wildlife clumps) will help provide suitable habitat for southern flying squirrel.

No forestry operations will be scheduled for the proposed Medway Lakes Wilderness Area pending the completion of the protected areas plan.

6. Does the forest lie within, adjacent to, or contain a conservation area: a) designated by an international authority, b) legally designated or proposed by relevant federal/provincial/territorial legislative body, or c) identified in regional land use plans or conservation plans?

International

Southwestern Nova Scotia is identified as an UNESCO Biosphere Reserve, as illustrated in Figure 15, from the Atlas of Canada.⁵ The Medway District is included in this area.



Figure 15. UNESCO Southwest Nova Biosphere Region (Atlas of Canada).

UNESCO describes this area, called 'Southwest Nova' as follows:

⁵ Atlas of Canada, available at <http://atlas.nrcan.gc.ca/>

Southwest Nova Biosphere Region represents the natural region of southwestern Nova Scotia. This encompasses the five Counties: Queens, Shelburne, Yarmouth, Digby, and Annapolis. The biosphere reserve comprises major landscapes of the province, which exist in a near-pristine condition with intact ecosystem structure, processes, and functions.

Located in the boreal needle leaf forest biogeographical region, it includes rolling plains, river plains, glacial plains, hills, drumlins, and coastal cliffs. As a result of its unique southerly position in the Maritimes, the region contains significant disjunctive populations of Atlantic Coastal Plain plant species, Blanding's turtle (*Emydoidea blandingi*), ribbonsnake (*Thamnophis sauritus*), and southern flying squirrel (*Glaucomys volans*).⁶

To carry out the complementary activities of nature conservation and use of natural resources, biosphere reserves are traditionally organized into three interrelated zones, known as the core area, the buffer zone, and the area of cooperation. The core areas of biosphere reserves are mostly public lands but may also be privately owned or belong to non-governmental organizations.⁷

Within the Southwest Nova Biosphere Region, the core area is comprised of the Tobetic Wilderness Area and Kejimikujik National Park and National Historic Site (Figure 16) and a Zone of Cooperation that includes the totality of the five western counties (Queens, Shelburne, Yarmouth, Digby and Annapolis).

No wetlands of international importance, migratory bird sanctuaries, or national wildlife areas exist adjacent to Medway District, despite parcels of land under each designation in Nova Scotia.

National

The Medway District is adjacent to Kejimikujik National Park, which is located southwest of the forest. Kejimikujik is the only inland national park in the Maritimes and features abundant lakes and rivers which are popular for canoeing. The woodlands and gently rolling landscape are also home to a variety of wildlife. Parks Canada notes that visitors will find historic canoe routes, portages, and many beautiful hiking trails in the Park.⁸

⁶ Canadian Biosphere Research Network at <http://www.biosphere-research.ca/index.htm>

⁷ Southwest Nova Biosphere Reserve Association at <http://www.swnovabiosphere.ca>

⁸ www.pc.gc.ca/pn-np/ns/kejimikujik/index_e.asp

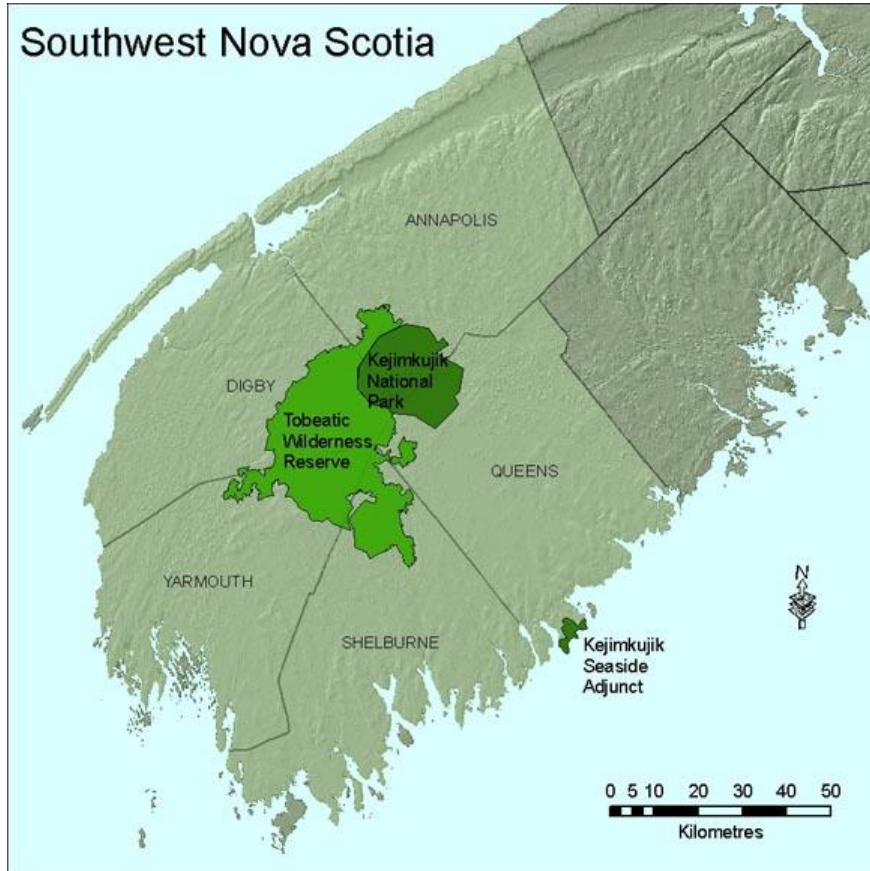


Figure 16. Southwest Nova Biosphere Reserve core area (map data courtesy of Nova Scotia Geomatics Centre).

Provincial

Under the Environmental Goals and Sustainable Prosperity Act, the Province committed to protect at least 12 percent of Nova Scotia’s land by 2015. A key recommendation of the Natural Resources Strategy (2011: <http://novascotia.ca/natr/strategy/>) was to engage Nova Scotian’s in “a focused dialogue about Provincial parks.” The strategy outlined the need to inform people about the park system, ask what they value most, and involve them in setting priorities. In 2012, the Province held public meetings in 20 communities and conducted nearly 1,500 interviews with park users and non-users to examine their perceptions and preferences. This consultation was informed by the 2009 Colin Stewart Forest Forum report and the 12 percent lands review process (2011), which included numerous stakeholder meetings and more than 700 written submissions. Specific properties were also based on comprehensive consultation with the public and Nova Scotia Mi’kmaq around land selection and use.

In August, 2013 the Province released *Our Parks and Protected Areas: A Plan for Nova Scotia* which reflects the input of Nova Scotian’s following release of the proposed plan early in 2013. This included more than 2,000 written submissions and input from more than 1,300 people at 17 public open house sessions held across the province (available at:

<http://novascotia.ca/parksandprotectedareas/plan/>. The Plan provides for the protection of 13 percent of the province by 2015. The provincial distribution of existing and planned wilderness areas, nature reserves, and Provincial parks is can be obtained from the interactive map: <http://novascotia.ca/parksandprotectedareas/plan/interactive-map/>.

Parcels of crown land bounding and within the Medway District are currently under protection or proposed for designation (Figure 17). At present, the Tobeatic, McGill Lake, and Cloud Lake Wilderness Areas have been designated by the Province. Additional parcels within the Medway District would expand the amount of protected area (Table 5) by just over 13,000 ha and is 14.6% of the Medway District.

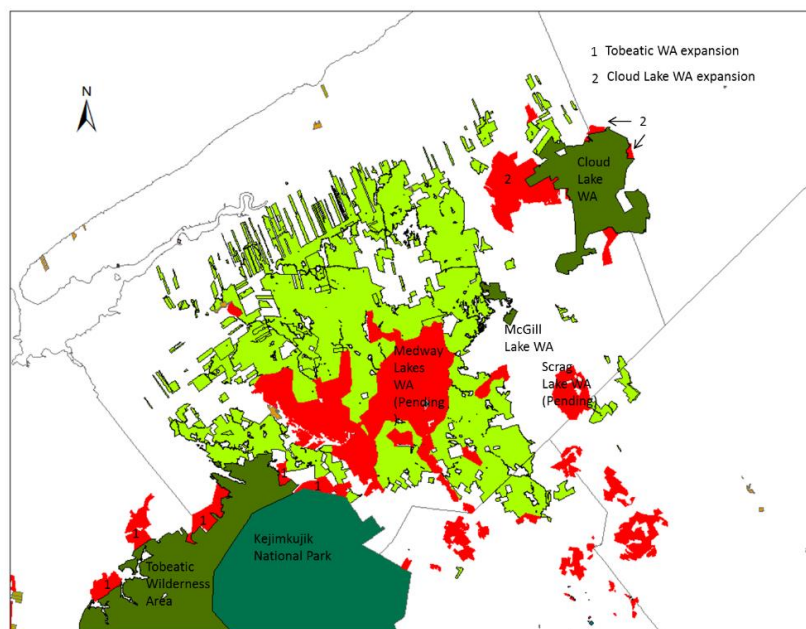


Figure 17. Distribution of existing and planned wilderness areas, nature reserves, and parks adjacent to and within the Medway District (light green). Pending wilderness areas and nature reserves are shown in red. Pending nature reserves are not labeled.

Part of the Medway District has been identified as one of six Biodiversity-Rich Landscapes (BRL) in the Western Crown Land Conceptual plan. The area has been designated as BRL because of its concentration of old growth forest, its variety of ecosystem types which make up the Fisher Lake Drumlins, as well as the important trout habitat and popular wilderness canoe routes in the area. A description of the Medway BRL and guidelines for forest operations within BRL's can be found at:

<http://novascotia.ca/natr/land/western-land/pdf/guidelines-August2015.pdf>

Table 5. Provincial protected lands bounding the Medway District and the area pending to expand existing or create new protected areas. Total area includes the areas with pending designation.

Protected Area	Total Area (ha)	Area within Medway District (ha)	Percent of Medway District
Medway Lakes Wilderness Area	19382	11792	13.02
Tobeatic Wilderness Area	16803	558	0.62
Snowshoe Lakes Nature Reserve	414	402	0.44
Skull Bog Lake Nature Reserve	524	293	0.32
Tupper Lake Nature Reserve	159	158	0.17
<i>Cloud Lake Wilderness Area</i>	<i>4894</i>	<i>4</i>	<i>0.00</i>
<i>Scrag Lake Wilderness Area</i>	<i>1838</i>	<i>2</i>	<i>0.00</i>
total (ha) *	37282	13203	14.58
* bold areas only, areas in italics overlap minimally with the Mersey Woodlands Medway region likely because of topological errors in the GIS data layers			

High Conservation Value Identified:

All lands designated or pending designation as Wilderness Areas, Nature Reserves, or Provincial Parks in the Medway District are HCVs. Lands within 500m of the National Park (Kejimikujik), the original boundaries of the Tobeatic, McGill Lake, and Cloud Lake Wilderness Areas, and within 50m of the West Branch Mersey River Nature Reserve are designated HCV.

All lands within the Medway Lakes Biodiversity-Rich Landscape are HCV.

Management Strategy:

Activities within designated Wilderness Areas, Nature Reserves, and Provincial Parks will adhere to their respective Acts and Regulations.

Activities within pending Wilderness Areas, Nature Reserves, and Provincial Parks will adhere to *Interim Management Policies and Procedures* (November 5, 2014) providing guidance to staff of NSDNR and NSE.

Timber harvesting or road building operations identified on annual operating plans within 500m of Kejimikujik National Park and the original boundaries of the Tobeatic, McGill Lake, and Cloud Lake Wilderness Areas, and within 50m of the West Branch Mersey River Nature Reserve will be reviewed with the appropriate agency. Recommendations from the agency will be addressed during management planning.

Forest operations within the portion of the Medway District designated as a BRL will follow “Guidelines for Biodiversity-Rich Landscapes under the Western Crown Land Conceptual Plan (July 2015)”. These include:

- Favour restoration of natural conditions;
- Conserve special biodiversity features;
- Reduce road impacts;
- Conserve old growth forests;
- Foster connectivity of mature forest;
- Conserve wetland habitats.
- Consider values listed by a panel of experts (as well as other known important biodiversity values) into management decisions; and
- Increase education, awareness and compliance within BRLs.

Proposed harvest plans within the Medway District will be posted for public review and opportunities for feedback is available to all agencies.

Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

7. Does the forest constitute or form part of a globally, nationally, or regionally significant forest landscape that includes populations of most native species and sufficient habitat such that there is a high likelihood of long-term species persistence?

Ecoregional planning in eastern Canada began over a decade ago and has recently culminated in a report by the collaborative conservation group called Two Countries, One Forest (Trombulack et al., 2008). This analysis of conservation priority for the Northern Appalachian/Acadian Ecoregion summarizes past work by both the Nature Conservancy and the Wildlands Project and then builds on these data and analyses. This research was driven by a team of researchers, conservation organizations, and foundations that focused on the identification of “irreplaceable and vulnerable locations in the Northern Appalachian/Acadian ecoregion for the purpose of identifying priority locations for conservation action” (Trombulak et al., 2008).

Three interwoven paths of analysis were explored to illustrate the conservation priority of the region: 1) the vulnerability of the region to human expansion (footprint); 2) the degree of irreplaceability of lands within the region; and 3) the assessment of subregions for irreplaceability and vulnerability.

Examination of the human footprint in the Medway District resulted in an assessment of little current influence and no change to negative change (fewer people) in the future as a result of current and projected population expansion in the area. The Medway District area of Nova Scotia remains sparsely populated and is projected to become even less populated in future (Trombulak et al., 2008).

The Medway District is juxtaposed between protected areas in southern Nova Scotia. It provides a functioning corridor situated between large protected areas to the west and east and is predicted to endure little human expansion into the area in future. As a result of this juxtaposition and relatively low human footprint, the above analyses indicates that the Medway District to be of high conservation value, but in general, low conservation threats.

Analysis of irreplaceability of the Medway District resulted in a consistent score of 0 or less than 20 (out of 100) under three conservation intensity targets. Scores of 0 mean the lands contribute little to regional conservation goals and scores between 1 and 20 illustrate only a small contribution (Trombulak et al., 2008).

Finally, analyses of the irreplaceable nature of subregions delineated using three methods (10 km²) hexagons, hydrologic units (watersheds), and biophysical units (ecological land classification) and their vulnerability (degree of current versus future human impact) showed that the Medway District scored a *high irreplaceability – high threat* in only the most extreme population expansion scenario using the hydrologic method of land partitioning (specifically, the Mersey watershed). Most common (9/10) was a score of *high irreplaceability – low threat or low irreplaceability – high threat* (Trombulak et al., 2008).

High Conservation Value Identified:

The Two Countries, One Forest examination of conservation priority in the Northern Appalachian/Acadian Ecoregion concluded that the Medway District has experienced relatively little human impact and makes only small contributions to broad-scale conservation goals with little predicted future change in vulnerability and irreplaceability. However, Trombulak et al. (2008) stipulate the area occupied by the Medway is valuable as an intact forest free from human expansion, and recommend elevating the District to HCV status.

As discussed in previous sections, the utility of designating the entire Medway District as HCV is questionable. What remains crucial is the function the District plays as a corridor between adjacent protected areas. The corridor area formerly designated under Bowater management as “LEMZ old growth and low impact zone” has been largely encompassed by proposed Protected Areas identified under the Parks and Protected Areas Plan initiative of the Environmental Goals and Sustainable Prosperity Act. These new protected area designations will also significantly expand the area of conservation beyond the original LEMZ corridor concept.

Management Strategy:

Under the Western Crown Land Conceptual Plan, almost 19 percent of the Medway District has been designated as the “Medway Biodiversity Rich Landscape (BRL)”. This BRL encompasses the corridor area and its surroundings, and has conservation identified as the dominant value (reference: Anon, NSDNR, 2015: *Guidelines for Biologically-rich Landscapes under the Western Crown Lands Conceptual Plan*). Under these guidelines the following new measures to protect biodiversity will be applied:

- Favour restoration of natural conditions
- Conserve special biodiversity features
- Reduce Road Impacts
- Conserve Old Growth Forests
- Foster Connectivity of Mature Forest
- Conserve wetland habitats
- Consider values listed by a panel of experts (as well as other known important biodiversity values) into management decisions
- Increase education, awareness and compliance within BRLs
- Encourage research within BRLs
- Support completion of Parks and Protected Areas

Old Growth forests formerly identified under Bowater management will be assessed for designation under the Department of Natural Resources Old Forest Policy 2012.

No harvesting will be carried out in the proposed Medway Lakes Wilderness Area pending completion of the Parks and Protected Areas Plan.

Forest areas that are in or contain rare, threatened or endangered ecosystems.

8.Does the forest contain naturally rare ecosystem types?

Three sources were considered in addressing rare ecosystem types: the examination of the Northern Appalachian/Acadian Ecoregion by Two Countries, One Forest, the Nova Scotia Forest Ecosystem Classification (FEC) system, and the Nova Scotia Ecological Land Classification (ELC) as assessed by Ecological Landscape Analysis.

The portfolio of critical sites compiled in mapped products by Two Countries, One Forest illustrate areas of conservation concern in the Medway District. Two features were identified through “freshwater wetland communities” and “viable matrix forest” analyses.

A single freshwater wetland community east of East Stoney Lake was identified by the Two Countries, One Forest analysis. This community spans 96 ha in two large block shapes, one encompasses East Stoney Lake and the other a wetland 900m to the east. Two large tracts of viable matrix forest (delineated because of their ability to provide linkages to core reserves) overlap from the southwest and the northeast. Both of these tracts are classed as Tier 2 and are not priority linkages for Two Countries, One Forest. The establishment of new protected areas in the Medway District (which includes the former LEMZ connectivity corridor) now connects two GAP 1 status protected areas, a linkage identified by Two Countries, One Forest. Wet forests that support coastal plain flora (NS FEC units CE1a, WC2a, WC3a, WC7a, and WD4a) are a unique and, in some cases, uncommon ecosystem in the western ecoregion. In Canada,

these nationally significant vegetation types are only documented in Nova Scotia. Other regionally, and in some cases nationally, significant vegetation types found in the Atlantic Coastal or Western ecoregions include some types of flooded forests (FP1, FP2, FP2a, and FP5), some open woodlands (OW1, OW4, OW2, OW5), karst forest (KA1, KA2), and one type of white pine forest (SP4b). Pilot predictive distribution mapping undertaken as part of the Ecological Framework for Land Cover Mapping project indicates that most of these vegetation types are not likely found in the Medway, however the possibility of occurrence is worth noting.

NSDNR’s Ecological Landscape Analysis uses the Provincial ELC to define “uncommon ecosections” as those that make up less than two percent of the area of an ecodistrict (Stewart and Neily, 2008a). In the four ecodistricts that occur in the Medway District, there are a total of 36 uncommon ecosections (Table 6). Twelve (12) of these are present in the Medway District; eight from South Mountain and four from Valley Slopes. These represent a total of 7,059 ha in the Medway.

Table 6. Ecosections that are classed as “uncommon” in the four ELC ecodistricts that occur in the Medway District.

610 - Annapolis Valley											
Ecological Land Classification Unit		Land Area			Ecological Emphasis Index(EEI)					Index Range	
Ecosection	Element	Total Area (ha)	% of Element	Medway (ha)	EEI Categories					All Land	Crown Land
					Reserve (ha)	Extensive (ha)	Ext/Int (ha)	Intensive (ha)	Converted (ha)		
IMSM	Floodplain	3,200	3.5	0	15	1,854	182	143	1,006	46-49	14
	<i>Element Summary</i>	3,200	3.5	0	15	1,854	182	143	1,006	46-49	14
DKLD	Marshes and Grasslands	6,180	6.8	0	275	581	2	24	5,298	12	87
	<i>Element Summary</i>	6,180	6.8	0	275	581	2	24	5,298	12.0	87
ICSM	Pine - Oak Flats	12,306	13.5	3	42	5,583	132	366	6,183	35-36	30
WCSM	Pine - Oak Flats	9,527	10.5	0	1	2,778	149	293	6,306	23-24	21-26
	<i>Element Summary</i>	21,833	24.0	3	43	8,361	281	659	12,489	30-31	26-28
ICHO	Pine - Oak Hills and Hummocks	1,305	1.4	0	-	366	-	18	921	21	
720 - South Mountain											
Ecological Land Classification Unit		Land Area			Ecological Emphasis Index(EEI)					Index Range	
Ecosection	Element	Total Area (ha)	% of Ecodistrict	Medway (ha)	EEI Categories					All Land	Crown Land
					Reserve (ha)	Extensive (ha)	Ext/Int (ha)	Intensive (ha)	Converted (ha)		
WCHO	Spruce Hemlock Pine Hummocks and Hills	183,161	43.5	46,570	44,362	122,269	6,804	8,336	3,487	29-29	88-88
WCHO	Bed and Black Spruce Hummocks and Hills	100,053	23.8	16,562	31,691	58,558	4,053	5,015	734	28-80	83-84
WCCR	Spruce Hemlock Pine Hummocks and Hills	1,101	1.2	0	-	382	51	21	648	28-38	23-27
	<i>Element Summary</i>	283,214	67.3	63,141	76,054	180,804	10,857	13,377	2,143	47-79	81-82
WMCA	Spruce Hemlock Pine Hummocks and Hills	3,634	0.9	41	19	3,110	236	77	192	67-70	75-76
WCDM	Spruce Hemlock Pine Hummocks and Hills	408	0.1	100	207	6,428	676	3,028	16,500	20-22	100
WCDM	Spruce Pine Flats	3,000	0.7	0	209	1,188	5	172	2,344	29-38	42-44
WCKK	Spruce Hemlock Pine Hummocks and Hills	70,129	16.7	8,105	11,014	52,210	3,253	2,833	2,823	74-76	78-79
WFHO	Spruce Hemlock Pine Hummocks and Hills	221	0.1	0	-	212	4	5	2,327	27-8	72-74
WMHO	Spruce Hemlock Pine Hummocks and Hills	3,504	0.8	473	97	2,870	138	162	237	66-68	73-74
	<i>Element Summary</i>	77,906	18.5	8,618	11,339	58,597	3,636	3,077	1,258	74-76	78-79
WTLD	Wetlands	23,531	5.6	3,496	7,475	14,804	544	995	112	79-80	83
ICSM	Spruce Pine Flats	497	0.1	0	-	409	40	0	19	82-82	72
	<i>Ecodistrict Total</i>	240,228	57.7	54,306	74,733	148,113	384	1,023	131	79-80	82
ICKK	Spruce Pine Hummocks	467	0.1	-	326	113	28	-	-	89-92	97
ICRD	Spruce Pine Hummocks	915	0.2	300	837	72	-	4	2	97.0	99
	<i>Element Summary</i>	1,382	0.3	300	1,163	185	28	4	2	95-96	98
WMKK	Tolerant Hardwood Hills	2,227	0.5	19	8	1,760	87	250	122	63-65	70-71
	<i>Element Summary</i>	2,227	0.5	19	8	1,760	87	250	122	63-65	70-71
WCDM	Tolerant Mixedwood Drumlins	7,396	1.8	3,577	1,939	4,640	416	354	46	76-79	79-81
WFDM	Tolerant Mixedwood Drumlins	1,054	0.3	10	35	670	68	97	184	55-58	76
WMDM	Tolerant Mixedwood Drumlins	5,134	1.2	2,251	1,294	3,142	194	310	194	74-75	79-81
	<i>Element Summary</i>	13,584	3.2	5,838	3,268	8,452	678	761	424	73-75	79-81
IMDM	Tolerant Mixedwood Hummocks	593	0.1	-	-	510	49	24	11	68-72	
WCRD	Tolerant Mixedwood Hummocks	1,931	0.5	240	934	887	5	-	105	83.0	98
WCSM	Tolerant Mixedwood Hummocks	681	0.2	-	-	562	84	36	-	66-72	74-75
	<i>Element Summary</i>	3,205	0.8	240	934	1,959	138	60	116	77-79	92-93
WTLD	Wetlands	15,341	3.6	2313	4,614	10,227	144	107	246	80-81	86-86
	<i>Ecodistrict Total</i>	420,887	100.0	83,965	104,855	276,797	16,152	18,631	4,442	76-78	81-82

710 - Valley Slopes												
Ecological Land Classification Unit		Land Area			Ecological Emphasis Index(EEI)						Index Range	
Ecosection	Element	Total Area (ha)	% of Element	Medway (ha)	EEI Categories					All Land	Crown Land	
					Reserve (ha)	Extensive (ha)	Ext/Int (ha)	Intensive (ha)	Converted (ha)			
IMSM	Floodplain	294	0.3	0	-	221	-	18	55	58		
	Element Summary	294	0.3	0	-	221	-	18	55	58		
WCRD	Pine - Oak Hills and Hummocks	189	0.2	0	-	144	27	12	6	62-69		
	Element Summary	189	0.2	0	-	144	27	12	6	62-69		
ICHO	Spruce Hemlock Pine Hummocks and Hills	421	0.5	0	-	367	35	5	13	68-72		
IFHO	Spruce Hemlock Pine Hummocks and Hills	4,545	5.2	351	-	3,680	250	191	424	63-66	67-68	
IMHO	Spruce Hemlock Pine Hummocks and Hills	1,115	1.3	56	75	827	42	120	51	66-68	87	
WCHO	Spruce Hemlock Pine Hummocks and Hills	4,702	5.3	74	9	2,489	163	332	1,709	43-44	54	
WFHO	Spruce Hemlock Pine Hummocks and Hills	13,198	15.0	385	157	7,262	659	1,875	3,244	47-50	71-73	
WFKK	Spruce Hemlock Pine Hummocks and Hills	27,845	31.6	1532	314	15,744	1,136	3,547	7,104	48-50	68-70	
WMHO	Spruce Hemlock Pine Hummocks and Hills	11,849	13.5	12	-	6,919	1,084	1,658	2,187	50-54	62-69	
WMSM	Spruce Hemlock Pine Hummocks and Hills	228	0.3	0	-	76	-	4	148	25		
	Element Summary	63903	72.5	2411	555	37,364	3,369	7,732	14,880	49-52	68-70	
ICSM	Spruce Pine Flats	98	0.1	19	-	85	5	6	2	68-70	75	
IFSM	Spruce Pine Flats	699	0.8	0	-	618	10	61	10	69-70	73	
	Element Summary	797	0.9	19	-	703	15	67	12	69-70	73	
WCKK	Tolerant Hardwood Hills	9,953	11.3	1790	143	7,520	716	867	708	62-66	71-73	
WFSM	Tolerant Hardwood Hills	71	0.1	0	-	5	-	-	66	5		
WMKK	Tolerant Hardwood Hills	6,751	7.7	128	220	5,128	378	482	543	48-50	84-85	
	Element Summary	16,775	19.0	1918	363	12,653	1,094	1,349	1,317	62-66	73-74	
WCDS	Tolerant Mixedwood Slopes	641	0.7	44	10	455	20	34	121	57-58	70-72	
WFDS	Tolerant Mixedwood Slopes	2,412	2.7	14	49	1,868	57	148	290	62-63	86	
WMDS	Tolerant Mixedwood Slopes	2,709	3.1	0	-	1,865	196	278	370	56-60	67	
	Element Summary	5,762	6.5	58	59	4,188	273	460	781	59-61	77-78	
WTLD	Wetlands	369	0.4	29	-	284	13	30	42	61-62	64	
	Ecodistrict Total	88,089	100	4435	977	55,557	4,791	9,668	17,093	53-55	70-72	

740 - LaHave Drumlins												
Ecological Land Classification Unit		Land Area			Ecological Emphasis Index(EEI)						Index Range	
Ecosection	Element	Total Area (ha)	% of Element	Medway (ha)	EEI Categories					All Land	Crown Land	
					Reserve (ha)	Extensive (ha)	Ext/Int (ha)	Intensive (ha)	Converted (ha)			
WMRD	Pine - Oak Hills and Hummocks	3,252	1.3	-	566	2,524	102	36	24	77-78	84	
	Element Summary	3,252	1.3	-	566	2,524	102	36	24	77-78	84	
IMHO	Spruce Hemlock Pine Hummocks and Hills	23,232	9.4	776	6,121	14,619	1,108	481	903	75-78	79	
IMRD	Spruce Hemlock Pine Hummocks and Hills	5,535	2.2	-	2,550	2,791	56	57	82	84-85	89-90	
PFHO	Spruce Hemlock Pine Hummocks and Hills	126	0.1	-	-	114	12	-	-	70-75		
WCHO	Spruce Hemlock Pine Hummocks and Hills	1,767	0.7	-	-	1,563	11	39	154	67	75	
WFHO	Spruce Hemlock Pine Hummocks and Hills	18,268	7.4	-	-	14,983	1,112	1,010	1,161	64-67	63-65	
WMHO	Spruce Hemlock Pine Hummocks and Hills	23,139	9.4	79	1,847	17,585	1,227	574	1,906	67-70	73-75	
	Element Summary	72,067	29.1	856	10,518	51,655	3,526	2,161	4,206	70-73	76-77	
ICRD	Spruce Pine Flats	1,352	0.5	-	-	1,258	8	-	83	70	74	
ICSM	Spruce Pine Flats	1,824	0.7	-	33	1,515	82	34	159	66-68	74-76	
IFHO	Spruce Pine Flats	3,117	1.3	-	1	2,644	135	116	220	66-68	74-75	
IFSM	Spruce Pine Flats	1,724	0.7	-	-	1,468	167	23	65	63-67	72	
IMSM	Spruce Pine Flats	31,850	12.9	152	2,674	24,811	1,723	618	2,023	69-71	77-79	
	Element Summary	39,867	16.1	152	2,708	31,696	2,115	791	2,550	68-71	77-78	
IMDM	Tolerant Mixedwood Drumlins	15,735	6.4	27	32	12,238	1,011	248	2,205	61-64	73	
WFDM	Tolerant Mixedwood Drumlins	34,294	13.9	117	214	24,089	2,459	1,658	5,875	56-60	70-72	
WMDM	Tolerant Mixedwood Drumlins	70,722	28.6	516	3,917	49,283	4,231	2,072	11,217	60-63	78-79	
WMKK	Tolerant Mixedwood Drumlins	5,160	2.1	-	-	4,219	326	131	484	64-67	67-74	
	Element Summary	125,911	50.9	660	4,163	89,829	8,027	4,109	19,781	59-62	74-76	
WTLD	Wetlands	6,280	2.5	73	906	5,009	154	58	153	75-76	83	
XXCB	Coastal Beach	14	0.0	-	-	14	-	-	-	75		
	Ecodistrict Total	247,391	100.0	1,741	18,861	180,727	13,924	7,155	26,714			

	Uncommon Ecosection; Not in Medway
	Uncommon Element; Not in Medway
	Uncommon Ecosection; HCVF in Medway
	Uncommon Element; HCVF in Medway

NSDNR's Ecological Landscape Analysis also classifies and maps "Elements" by grouping ecosections that support similar forest and ecosystem conditions. By the same 2 percent threshold measure, there are four uncommon elements in the Medway District, three in South Mountain (Spruce Pine Hummocks, Tolerant Hardwood Hills, and Tolerant Mixedwood Hummocks), and one in Valley Slopes (Spruce Pine Flats).

The Ecological Landscape Analysis also provides a measure of land-use pressure – the Ecological Emphasis Index (EEI). The index range of 0 to 100 is calculated based on the balance of four land-use classes: Reserve, Extensive Management, Intensive Management, and Converted. Higher index values indicate a greater proportion of intact ecosystems and lower levels of land-use pressure. The index can be used both to monitor trends over time and for prescribing land-use during landscape level planning.

High Conservation Value Identified

East Stoney Lake is designated as HCV. Red maple fens are designated as HCV. Ecosections classed as "uncommon" in the Ecological Landscape Analyses (ELA), and occurring within the Medway District, are designated as HCVF's (Appendix 8).

Management Strategy:

Forests that are uncommon in the Medway District will be managed using the following strategies:

- Inland barrens (OW2, OW4, and OW5) will not be included in harvest planning.
- Vernal pools and other wetland features as identified in the NSDNR wetland database will not be operated in and will be afforded a SMZ if open water is present.
- Harvest prescriptions, appropriate for the vegetation and soil type present, will be developed using pre-treatment assessment.
- Uncommon ecosections and elements identified as HCVF's through Ecological Landscape Analysis will be managed to favor restoration and maintenance of natural ecosystem conditions as indicated by monitoring the Ecological Emphasis Index on crown land. This entails that the management of forests will be FEC based, and favor a balance of "reserve" and "extensive" practices over "intensive" and "conversion". Extensive management will include provisions for natural stand structure, including large snags and coarse woody debris, species diversity, and multi-cohort development where consistent with natural disturbance and successional processes.

9. Are there ecosystem types or ecosystem type conditions within the forest or ecoregion that have significantly declined, or under sufficient present and/or future development pressures that they will likely become rare in the future (e.g., old seral stages)?

Several stand level ecosystems could be considered uncommon and declining in southwestern Nova Scotia based on sampling done for the Forest Ecosystem Classification for Nova Scotia 2010 (Neily et al., 2013). The occurrence of the following red pine vegetation types has been reduced on the landscape due to fire suppression efforts of the past century: SP2 (Red pine / Blueberry / Bracken), SP3 (Red pine – White pine / Bracken – Mayflower), OW4 (Red pine – White / Broom crowberry / Grey reindeer lichen) and WC4 (Red pine – Black spruce / Huckleberry – Rhodora / Sphagnum). The same fire suppression efforts and perhaps the abundance of white-tailed deer may have also impacted the occurrence of red oak dominated vegetation types such as: IH1a (Large-tooth aspen / Lambkill / Bracken, Red Oak variant), OW5 (red oak / Huckleberry / Cow wheat – Rice grass / Reindeer lichen), SP9 (red oak – White pine / Teaberry) and TH6 (Red oak – Yellow birch / Striped maple).

Numerous authors agree that old growth forest has declined in eastern North America and that forest management activities have simplified forest patterns and created even-aged forests (Duinker and Bush, 2009; Davis 1996). Historical old growth Acadian forest is expected to have consisted of shade-tolerant species, such as eastern hemlock, red spruce, sugar maple, American beech, and yellow birch in varying mixtures (Mosseler et al., 2003; Stewart et al., 2003; Duinker and Bush, 2009).

Old growth definitions (NSDNR, 2012b) for the Acadian forest include the following features:

- Uneven, multi-aged stand structure which includes a patchy, multi-layered, multi-species canopy of trees with several age classes.
- A forest stand where 30% or more of the basal area is in trees 125 years or older, at least half of the basal area is composed of climax species, and total crown closure is a minimum of 30%.
- Forest development is marked by mature canopy processes of gap formation and recruitment from a developed understory.
- Stands include large overstory trees, occasional dead-topped stag trees, and decadent wolf trees.
- Standing dead and dying trees.
- Fallen, coarse woody debris in varying states of decay.
- Natural regeneration of trees within canopy gaps.

Current age class distribution in the Medway District is illustrated in Figure 18 (from Bowater Mersey Forest inventory data) where the age class distribution of the forest is illustrated. Over 1,100 ha of forest are aged greater than 120 years.

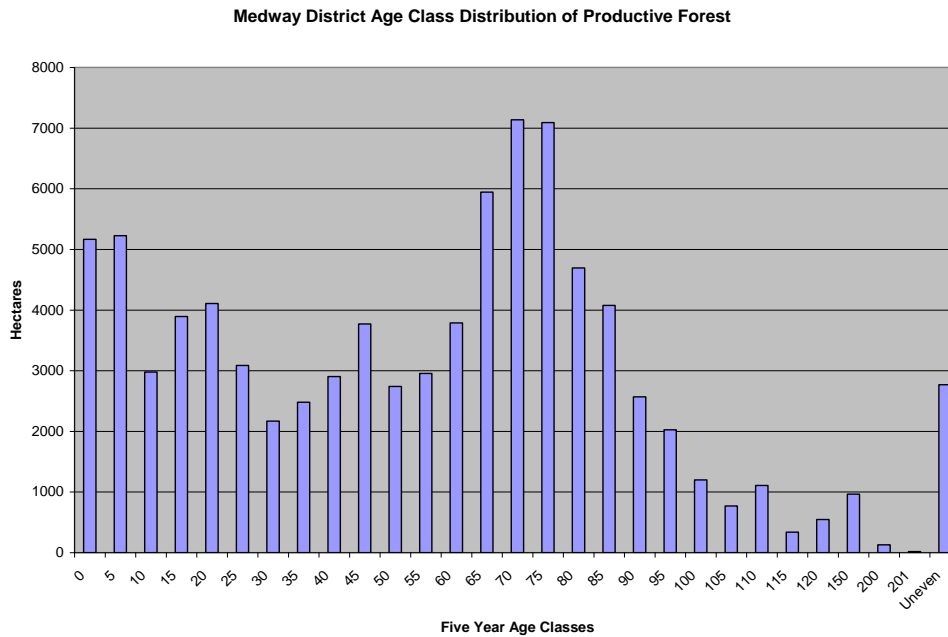


Figure 18. Forest age class distribution in the Medway District.

NSDNR introduced an Interim Old Forest Policy in 1999 to “conserve the remaining old growth forests on public land and ensure that a network of the best old forest restoration opportunities is established” on at least 8 percent of crown forest in each ecodistrict. The policy objectives are to conserve the best quality, ecologically representative, and largest patches available using the IRM planning system. The Old Forest Policy was updated in 2012 and was used to assess Old Forest HCVF opportunities in the Medway District.

Forests designated under the Old Forest Policy include a range of age and climax community types, generally concentrated in large patches that are inherently resilient and able to support disturbance dynamics.

Following the Ecological Landscape Analysis approach, conditions were initially assessed across entire ecodistricts to identify status and gaps, irrespective of ownership (Stewart and Neily, 2008b).

Appendix 8 summarizes the status of old forest policy implementation within the four ecodistricts found present in the Medway District. Ecosystem representation was evaluated at the element level:

- Most (93 percent) of the Medway District falls within the South Mountain Ecodistrict (720). In this ecodistrict the Policy goals have been exceeded, with 27.9 percent of crown land identified, to a surplus of 45,313 ha. All elements are represented, although the smallest element, Tolerant Hardwood Hills, is at a low level.

- LaHave Drumlins (740) ecodistrict has also met the policy objectives, with 31.7 percent of crown land identified, to a surplus of 8,786 ha. All elements are well represented.
- With the Crown acquisition of the former Bowater Mersey lands, the Valley Slopes (710) ecodistrict has fallen below the 8 percent policy target to 4.7 percent. It requires the identification of an additional 236 hectares, along with representation of two elements.
- In the Annapolis Valley ecodistrict (610) only 17 ha of old forest has been identified, and it has very low representation of elements. This ecodistrict makes up less than 1 percent of the Medway District. The Annapolis Valley has very little crown land and a high level of land-use pressure with conversion to non-forest, as indicated by an Ecological Emphasis Index of 26 to 28 (the lowest in the province). Although only 114 hectares are required to meet the 8 percent target, it may be challenging to find old forest conservation opportunities.

Despite the surplus of land contributing to the old forest policy, most exists within the reserve system of Parks and Protected Areas. Due to the lack of a reliable old growth inventory, it will be assumed that this consists primarily of “restoration opportunity” forests. Levels of true Class 1 Old Growth forests are assumed to be below 8 percent in all ecodistricts, and thus opportunities to conserve high quality Old Growth stands remain a priority for IRM planning.

Prior to acquisition by the Crown, Bowater Mersey had identified a number of Old Forest stands. Although a significant amount of this is captured in the proposed Parks and Protected Areas Plan, there are a number of stands located outside of these reserves. Upon further assessment, some these stands could be conserved under the Old Forest Policy.

An old growth research project commissioned by Bowater Mersey through Dalhousie University (Duinker and Bush, 2009) derived a comprehensive definition of old growth and described how to create these conditions through silvicultural intervention. Although it is not possible to grow a stand any faster, silvicultural treatments can assist in the development of forest structure (e.g., small gaps, vertical structural complexity, standing or fallen dead wood) that can provide habitat features for old-growth dependent wildlife species.

Duinker and Bush (2009) also proposed that old growth is a continuum over a spectrum of “old growthness” and should be managed as such. Management of old forest and pre-old forest (i.e., that continuum of ages) can be management across a landscape following the Ecological Landscape Analysis approach (Stewart and Neily, 2008a), where forest development stage representation (including mature forest) is tracked across the landscape according to levels that reflect natural patterns of disturbance and succession.

High Conservation Value Identified:

- All forests designated under the Old Forest Policy are designated HCVF
- In ecodistricts where the 8 percent Old Forest Policy target has not been met, or element representivity gaps exist, forests in the associated elements will be HCVF’s.
- Old forest stands previously identified under Bowater Mersey’s management plan are designated HCVF.

- On an ongoing basis, additional forest stands identified as potential Class 1 Old Growth will be designated as HCVF's until reviewed by IRM teams. Identification may arise from a variety of sources, including Forest Resource Inventories (FRI), timber cruises, Pre-Treatment Assessments (PTAs), reports from NSDNR staff, contractors, research organizations, or the public.

Management Strategy:

NSDNR will evaluate opportunities to fill the Old Forest Policy gaps in the Valley Slopes (710) and Annapolis Valley (610) ecodistricts. An exercise will be undertaken by the regional IRM team following Old Forest Policy procedures.

Potential old growth forest stands (i.e., Class 1 under the Old Forest Policy) previously identified by Bowater Mersey, or other forest stands identified by timber cruises, PTAs, FRI, or reports from staff, contractors, researchers, or the public will be evaluated by the IRM team. High probability candidates will be assessed using the NSDNR old forest scoring protocol. A management or conservation strategy will be determined based on the old growth values present, with guidance from Old Forest Policy procedures. The Old Forest Coordinator designated under the Old Forest Policy will be available to advise IRM teams. Harvest prescriptions and silvicultural treatments designed to maintain or enhance old forest characteristics may be considered.

No harvesting will be carried out in the proposed Medway Lakes Wilderness Area pending completion of the Parks and Protected Areas Plan.

After designation of areas under the Parks and Protected Areas Plan, all forest stands, following criteria identified in the Old Forest Policy (e.g., old growth and old forest restoration stands) will be accounted for in the Old Forest Policy.

Harvest prescriptions based on forest ecosystem classification will be developed using NSDNR's Pre-treatment Assessment procedure.

10. Are there ecosystems that are poorly represented in protected areas and likely to become rare in an intact state due to ongoing human activities?

Broadly speaking, ecological representation describes the degree to which the range of ecosystem diversity is sustained in a naturally functioning, unmanaged state. The concept was introduced as a strategic component of protected areas planning, where the aim is to secure the range of ecosystem diversity within reserve systems. The overall goal is biodiversity conservation through protection of natural habitat diversity. It is employed as a "coarse scale" ecosystem planning concept.

Gap Analysis Method:

Using NSDNR’s Ecological Landscape Analysis process coupled with the hierarchical Nova Scotia Ecological Land Classification (ELC), a gap analysis was carried out to evaluate the reserve status of the ecosections and elements found within each of the four ecodistricts in the Medway District (Stewart and Neily, 2008a; Neily et.al., 2005). Representivity gaps were identified across full landscapes (ecodistricts), regardless of ownership. Following this, the relative level of occurrence of the representivity gaps within the Medway District were assessed in order to gauge both the degree of ownership responsibility and the opportunity to address representivity gaps.

For this exercise, reserved lands were considered to include the full range of legal and policy mechanisms that provide effective land protection. Legal protection is considered the most secure, and includes National and Provincial Parks, Wilderness Areas, Nature Reserves, Conservation Easements, etc. Lands governed by administrative policies that provide effective long term protection include NSDNR’s Old Forest Policy, Park Reserves, and proposed Wilderness Areas identified under the Parks and Protected Areas Plan. Analysis was performed using the Forest Model’s most up to date mapping (2014) of protected area, which corresponds to the Ecological Emphasis Index Landbase Classification theme of “Reserve Class” (O’Keefe, 2007).

Quantifying Levels of Representation:

Determining an answer to the question of “how much is enough?” is a difficult challenge, with many dependencies, including type of protection, scale of application, and the type of ecological feature assessed. This assessment used a tiered approach to evaluate levels of representation at both the ecosection and element scale of the ELC. Four categories were used to indicate the adequacy of representation, calculated as a percentage of their total area under protection. This type of categorization was recently employed in Port Hawksbury Paper’s (PHP) Gap Analysis for HCVF on Crown Lands in eastern Nova Scotia. The same evaluation classes used by PHP were also used for the Medway District, as displayed in Table 7.

Table 7. Classes of ecological representation.

Criteria	Level of Representation Adequacy
≤ 2%	Lacks
> 2% and ≤ 6%	Fair
> 6% and ≤ 14%	Good
> 14%	Excellent

The “excellent” level of representation is consistent with the overall level of protection expected at a provincial scale upon completion of the Environmental Goals and Sustainable Prosperity Act goal to protect 12 percent of Nova Scotia by 2015. When applied at the much finer scale of ecosections and elements used in the Medway District gap analysis, the “good” and “fair” categories are considered adequate levels of representation.

High Conservation Value Identified:

Results of the representivity analysis are summarized in Appendix 9.

All ecosections classed as “lacking” representation within ecodistricts, and occurring within the Medway District, are HCVF’s. This equates to 17 ecosections encompassing 4,575 ha

All elements classed as “fair” or “lacking” representation within ecodistricts, and occurring within the Medway District, are HCVF’s. This equates to 9 elements, encompassing 5,206 ha. Two of these have a “fair” level of representation, while the remaining seven “lack” representation.

The analysis determined that a total of 44 ecosections across the four ecodistricts lack representivity. Most ecosections and elements in the South Mountain and LaHave Drumlins ecodistricts have adequate levels of protection, while most of those occurring in the Valley Slopes and Annapolis Valley lack representation. Only a small proportion (5%) of land in the Medway District falls within these two ecodistricts, and the overall level of Crown ownership in these two ecodistricts is low, which limits the Crown protection opportunity.

Management Strategy:

HCVF Ecosections and Elements that “lack” representation will be managed to favour restoration and maintenance of natural ecosystem conditions as indicated by an overall maintenance or increase in Ecological Emphasis Index on crown land. This entails that the management of forests will be FEC based, and favor a balance of “reserve” and “extensive” practices over “intensive” and “conversion”. Extensive management will include provisions for natural stand structure, including large snags and coarse woody debris, species diversity, and multi-cohort development where consistent with natural disturbance and successional processes.

HCVF Elements which “lack”, or have “fair” representation will be managed to restore and maintain the landscape level mature and seral stage targets for the element, as identified in the Ecological Landscape Analysis, and as related to natural disturbance and successional processes.

No harvesting will be carried out in the proposed Medway Lakes Wilderness Area pending completion of the Parks and Protected Areas Plan.

11. Are large landscape level forests (i.e., large un-fragmented forests) rare or absent in the forest or ecoregion?

To understand the matter of spatial resolution of investigation, a definition of landscape level forest is required (Lavers and Staicer, 2009). The FSC Maritimes Region Standard (2008) states the landscape level is “at a spatial scale above a single plant community or forest stand and below a region.” The Nature Conservancy of Canada and Two Countries, One Forest both used a spatial resolution unit of 10,000 ha for recent landscape scale investigations, and Global Forest Watch used even greater resolutions.

A recent determination of the extent of human footprint in Medway District by Two Countries, One Forest resulted in an assessment of little current influence and no change to negative change (fewer people) in future as a result of current and projected population expansion in the area (Figure 19). Medway District remains sparsely populated and is projected to become even less populated in future (Trombulak et al., 2008).

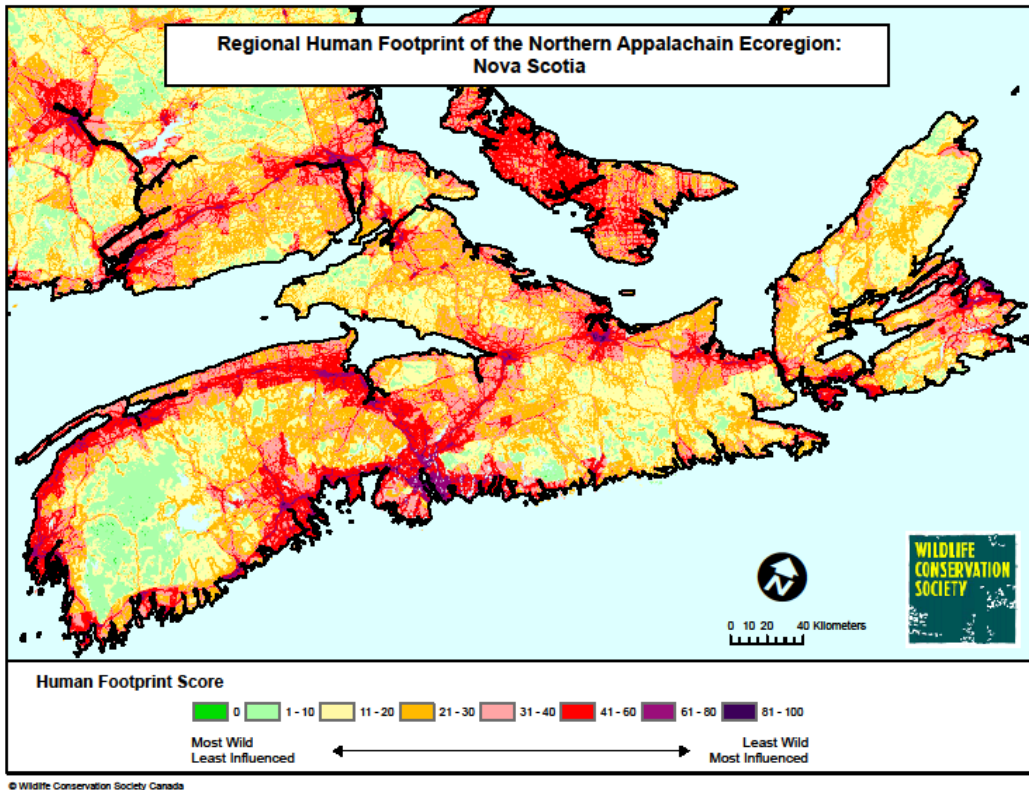


Figure 19. Human footprint extent in Nova Scotia as calculated by the Wildlife Conservation Society⁹ and reported in Two Countries One Forest.

According to the Global Forest Watch intact forest analysis for Canada, Nova Scotia currently retains very few large, intact forest areas (Figure 20). Medway District is not captured in the intact forest analysis. Southwest of Medway District, Kejimikujik National Park is highlighted and west and southwest of the Park, the Tobeatic Wilderness Area is identified as a 500-10,000 km² tract of forest.

⁹ Two Countries, One Forest at http://programs.wcs.org/portals/42/media/file/NApps_HF.jpg

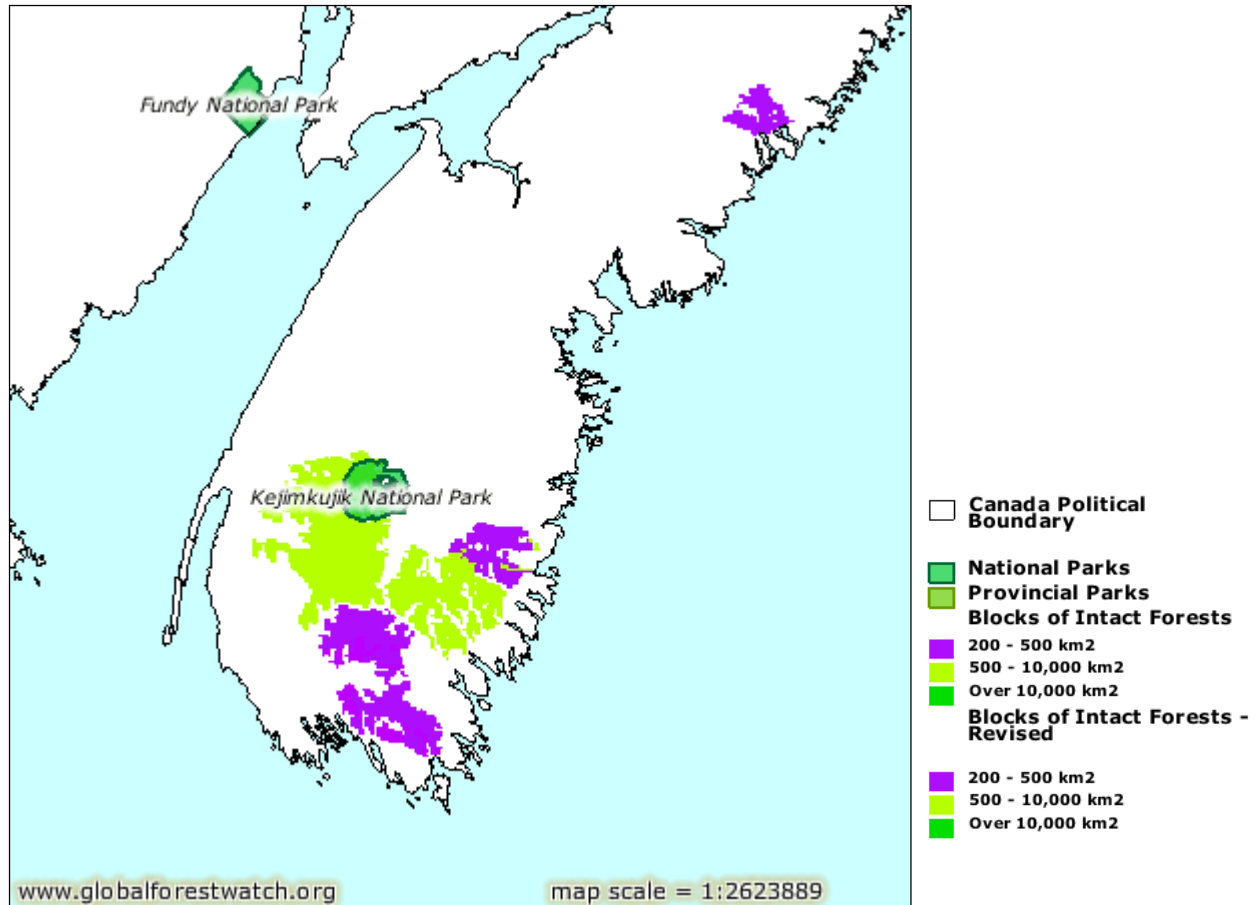


Figure 20. Large intact forest area in southwestern Nova Scotia.¹⁰

The Ecological Landscape Analysis for the South Mountain (720) ecodistrict (NSDNR, 2014) includes a GIS-based “Road Index” which provides a standard assessment and mapping of road distributions across the ecodistrict. This helps planners to objectively explore options for managing road networks and assess the intersection of road effects with other features of the landscape. Density, distance and type of linear feature (e.g., road types, power lines) are used to calculate index values that indicate relative road pressure. The index value is mapped over all areas of the landscape using a 1 hectare grid. The overall index may be calculated for any area of interest, such as element, ecosection, ecodistrict, or ecoregion, by averaging the index values within the area to provide a relative indication of land-use pressure. The index provides a numerical indicator of road influence that can be used to monitor temporal changes and compare different landscapes.

In discussing road ecology, Forman (2004) describes five distinctive landscape types in North America: city-suburb, agricultural, forestry, arid-grassland, and natural landscape. Each landscape type has a characteristic pattern of road networks with distinctive ecological effects and planning

¹⁰ Global Forest Watch at <http://www.globalforestwatch.org/english/interactive.maps/canada.htm>

considerations (Forman and Hersperger, 1996). These were adapted in Nova Scotia to classify five Road Index Benchmark Ranges associated with particular land use settings:

- Remote Landscape (RI 0 – 6): Unpopulated with few roads, trails or other linear features
- Forest Resource (RI 7 – 15): Forest access roads are the primary linear feature
- Mixed Rural (RI 16 – 24): Mixed land use of rural settlement, forestry, and agriculture
- Agriculture/Suburban (RI 25 – 39): Suburban settlement and/or open agricultural fields
- Urban (RI 40 – 100): Urban environment with high building densities, roads, and few tracts of undeveloped land outside municipal parks

Road index for the South Mountain is illustrated in Figure 21. Currently the South Mountain ecodistrict, which is approximately 93% of the Medway District, has a low overall road index value of 5.3 which falls within the “Remote” classification values range of 0 to 6. About 45 percent of the ecodistrict falls within this category (Table 8). Most of the remainder of the ecodistrict falls within the “Forest Resource” category (37 percent of the ecodistrict). The highest road index values in the Medway District occur along the major transportation route (Highway #8) between Annapolis Royal and Liverpool. Road index values are also high in the communities of Perotte and West Dalhousie, but these areas are inclusions of privately owned lands with only a few isolated Crown owned blocks included as part of the Medway District.

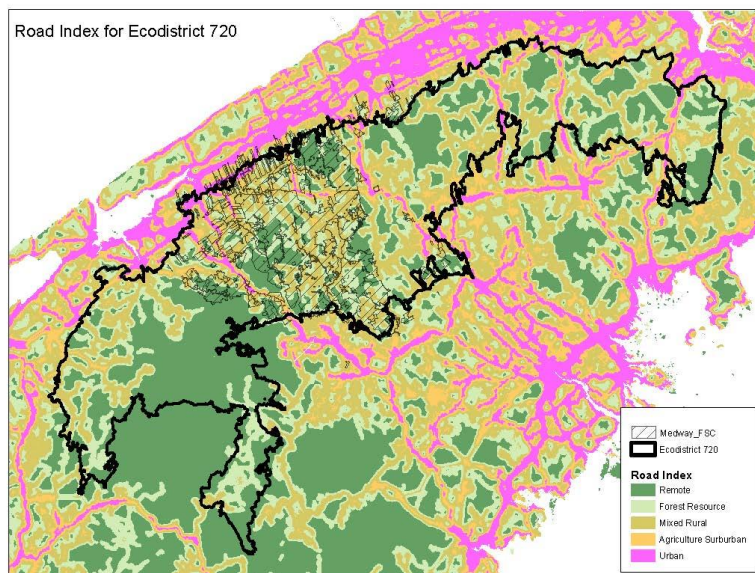


Figure 21. NSDNR road index map from the ecological landscape analysis report for the South Mountain Ecodistrict 720 (with the Medway District identified).

Table 8. Distribution of road index classes in the South Mountain ecodistrict.

Road Index Value		Area of Ecodistrict Affected	
Indication	Range	Hectares	Percent
Remote	0-6	205,133	45.1
Forest Resource	7-15	170,347	37.4
Mixed Rural	16-24	63,521	14
Agriculture Suburban	25-39	15,845	3.5
Urban	40-100	315	0.1
Total		455,161	100

Although the Medway District does not have any very large patches (i.e., more than 10,000 ha) of “Remote” land as defined by the road index, there are several medium-large (more than 1,000 ha) patches within the District. These areas are important for ecological processes and biodiversity values for the region and for connectivity from the Medway District to the large un-fragmented forest to the west.

High Conservation Value Identified:

If we accept the definition of large landscape level forest at more than 10,000 ha, then neither the Global Forest Watch nor CSFF analyses result in identification of large landscape level forests. However, the Medway District is adjacent to one of the few large landscape level forests in the province (i.e., Kejimikujik National Park - Tobeatic Wilderness Area). Areas of the Medway District that were Old Growth and Low Impact Zones under Bowater’s Landscape Ecological Management have been included in the proposed Medway Lakes Wilderness Area.

The proposed Medway Lakes Wilderness Area is designated as HCV.

Management Strategy:

No forest operations will occur in the proposed Medway Lakes Wilderness Area pending completion of the Parks and Protected Area Plan.

Planning of new roads will attempt to minimize the effects of construction on fragmentation, aquatic ecosystems, sensitive sites, and protected areas. The impact of road and trail construction will be minimized by using best management practices in all facets of road and trail construction. Development of road and trail maintenance plans will ensure that deterioration of roads do not cause negative ecological effects. Road decommissioning will include an analysis of road systems to determine where decommissioning might be implemented. Factors such as resource management, scheduling, recreational activities, connectivity among roadless patches, proximity to reserve areas, removal of bridges and culverts, and establishment of new forest may be included in the analysis.

12. Are there nationally/regionally significant diverse or unique forest ecosystems or forests associated with unique aquatic ecosystems?

As noted in Question 1, a single record of Atlantic salmon exists from the Round Hill River 200m from the Medway District past the confluence of the East and West Branches of the Round Hill River. The Round Hill River system is not included as part of the endangered Bay of Fundy Atlantic salmon spawning grounds, but evidence has shown historic use by salmon. In 2015, Nova Scotia power constructed a new fish way at McGowan Lake dam which now allows access to the headwaters of the Medway river watershed.

Use of the Upper Mersey River system by brook trout was discussed in Question 3 and areas used as summer cold-water refugia addressed (Sandy Bottom, Boot, Gull, and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers) (Reg Baird pers. comm., 2009). These areas are important for summer survival as provincial brook trout numbers continue to decline (Trout Nova Scotia, 2009).

In 1991, lands owned by Bowater Mersey were entered into an agreement with the Province to protect wetlands. This agreement, part of the Eastern Habitat Joint Venture, sought to maintain the existing wetlands base on Bowater properties, and enhance the production potential for waterfowl and other wildlife on selected Bowater sites. Through this stewardship agreement, a wetland inventory was conducted to determine the number, classification, and location of wetlands in Medway District. A document highlighting inventory and management recommendations was completed for the Medway District in 1993 (Nova Scotia Eastern Habitat Joint Venture Stewardship Project). This document recommends a number of general guidelines for wetlands within the District designed to minimize loss of wetland function.

These guidelines apply to all wetlands within the District and include:

- Designation of special management zones for all wetlands adjacent to a watercourse that are identifiable on 1:50,000 topographic maps,
- Prohibition of heavy equipment within 30m of a watercourse,
- Permission to conduct selection harvesting up to 40 percent removal in SMZs, and
- Construction of roads according to government standards.

Although the report recommends up to 40 percent removal in SMZs, in the Medway District if required there is no harvest or volume removal in SMZs.

High Conservation Value Identified:

No new HCVs are necessary for Atlantic salmon or brook trout in Question 12 (refer to Questions 1 and 3 for more details on these species).

All wetlands will be considered HCVs.

Management Strategy:

Strategies for Atlantic salmon and Brook trout are addressed in Questions 1 and 3, respectively. The NSDNR will continue to support trout monitoring and research in the Medway District through the activities of Trout Nova Scotia and MTRI.

The IRM review process will assess the potential impact of harvest operations on all wetlands and prescribe measures to be taken to maintain their conservation value. All wetlands that contain open water will be buffered with a SMZ.

Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).

13. Does the forest contribute to maintaining the quality, quantity, and seasonal timing for water flows that are a source of drinking water, irrigation water, or water for a critical economic activity?

The Medway District contributes ecological services for water quality as it contains headwater streams for the Mersey, Medway, Sissiboo, and Annapolis Rivers (Figure 22). A small portion of the Medway District is also located within the Lake Cady Water Supply area (Figure 23). Nonetheless all forested land plays an important hydrological role. The Medway District contains streams, bogs, and water receiving/shedding areas that together influence many water quality factors (Stewart, 2009), not only for drinking, but for recreational activities such as angling and canoeing (Lavers and Staicer, 2009).

Of the five watersheds found within the Medway District, the Annapolis and Mersey Rivers have been subjected to long-term monitoring. Since 1992, the Clean Annapolis River Project (CARP) group has been monitoring water quality parameters in the Annapolis River. Its most recent report indicates that there has been no significant change in various water quality features. However, in some locations along the river a significant increase in bacteria (*E. coli.*), a reduction in dissolved oxygen, and an increase in temperature have been observed (Glenen and Sharpe, 2009; Freeman, 2013). The river system is located in the Annapolis Valley, which is one of the most productive agriculture areas within the province. This long-term monitoring program is valuable for improving our understanding of land-use change on water quality.

Brylinsky (2014) began collecting baseline information within the Annapolis watershed and noted that nutrient levels and fecal coliform bacteria numbers are high. He indicates that the most likely cause is the high level of agriculture present within the Annapolis watershed.

Between 1989 and 2006, Parks Canada monitored water quality parameters at the confluence of the Upper Mersey River and Kejimikujik Lake. Its results showed a significant declining trend in the stream flow index with the most dramatic change being minimum flow levels. These

minimum flow levels resulted in less water in low water level areas during summer months. Although probably related, in part, to climatic changes, there is reason to believe that the increased flash flow events could be related to land use changes upstream from the Park (Lavers and Staicer, 2009).

Forest cover removal through timber harvesting is a land cover change, but according to Martel (2007), who used benthic invertebrates as an indicator, aquatic health in streams in the upper Mersey watershed are not negatively affected by silviculture practices that include at least a 20m buffer on all watercourses and less than 20 percent of the watershed in a young development stage or recently harvested state. Other research on forest harvesting and water quality has been well documented through the Pockwock Bowater Watershed Study (Pockwock Bowater Watershed Project, 2005) located east of the Medway District. Results from this research showed forest harvesting caused only slight water table and discharge peak increases during the first year after harvesting. Beyond this, impacts of assessed forest cover changes on water quality were negligible.

Research results suggest that the most important consideration in reducing impacts on water quality is to avoid exposing and altering the flow of ephemeral (temporary) and subsurface water channels. Since these water features are located close to the surface they are more susceptible to heating influence from sunlight exposure prior to entering the main channel. As well, research suggests that watersheds that are fed by ground water rather than surface water are more resilient to land use change (Pockwock Bowater Watershed Project, 2005).

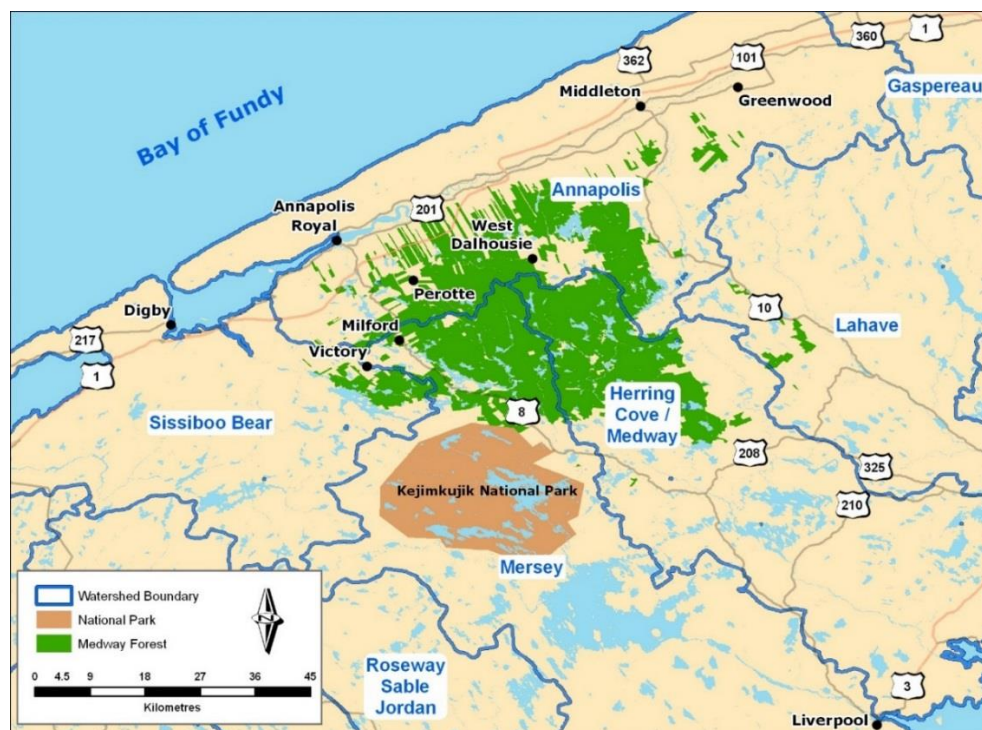


Figure 22. Watersheds of southwestern Nova Scotia (Nova Scotia Environment).¹¹

¹¹ Nova Scotia Environment at http://gov.ns.ca/nse/water/docs/WaterStrategy_NSWatershedMap.pdf

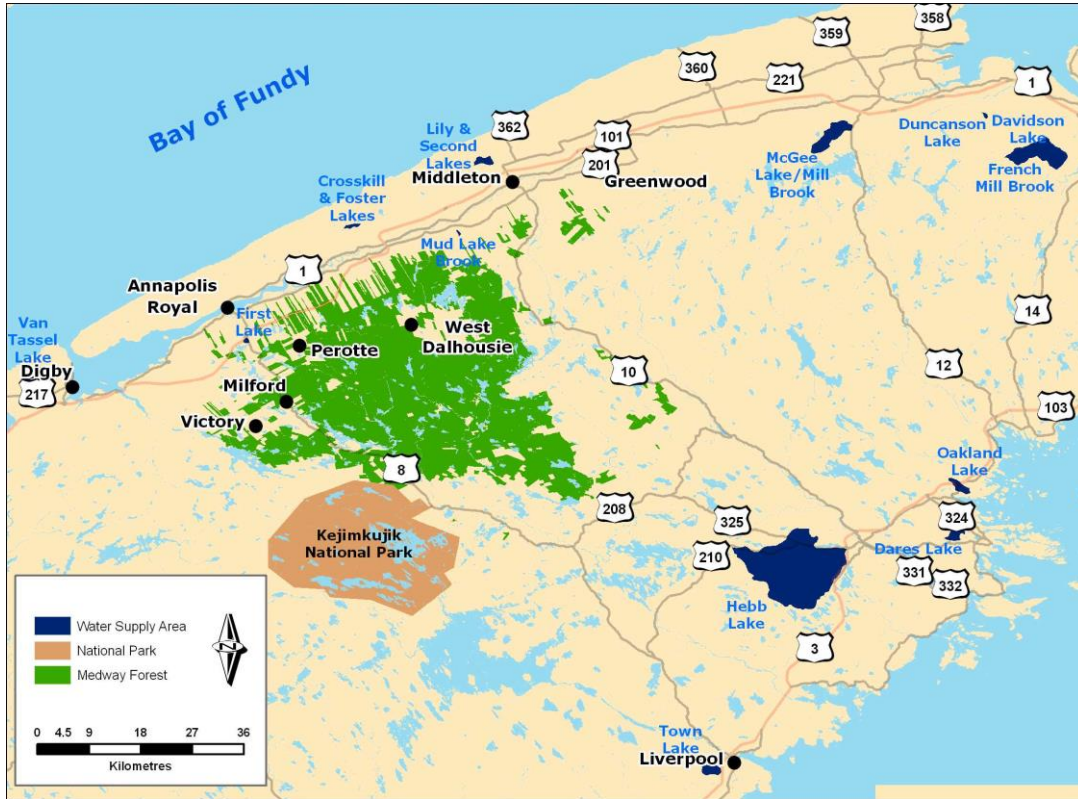


Figure 23. Water supply areas for the area surrounding the Medway District (KBM, 2009).

The Medway District is adjacent to an agriculture area known as the Annapolis Valley and a few smaller agriculture areas near West Dalhousie and along the Old Annapolis Road (Figure 24). The Valley area is the most productive agriculture area within Nova Scotia and requires a significant amount of irrigation. The main irrigation source for the Valley area is the Annapolis River watershed. In 2002, the Nova Scotia Department of Agriculture established a Water Task Group to address sustainable water management in the agriculture, fisheries, and aquaculture sectors in Nova Scotia. To date there have been no issues related to watershed management within the Medway District with respect to the Group’s mandate.

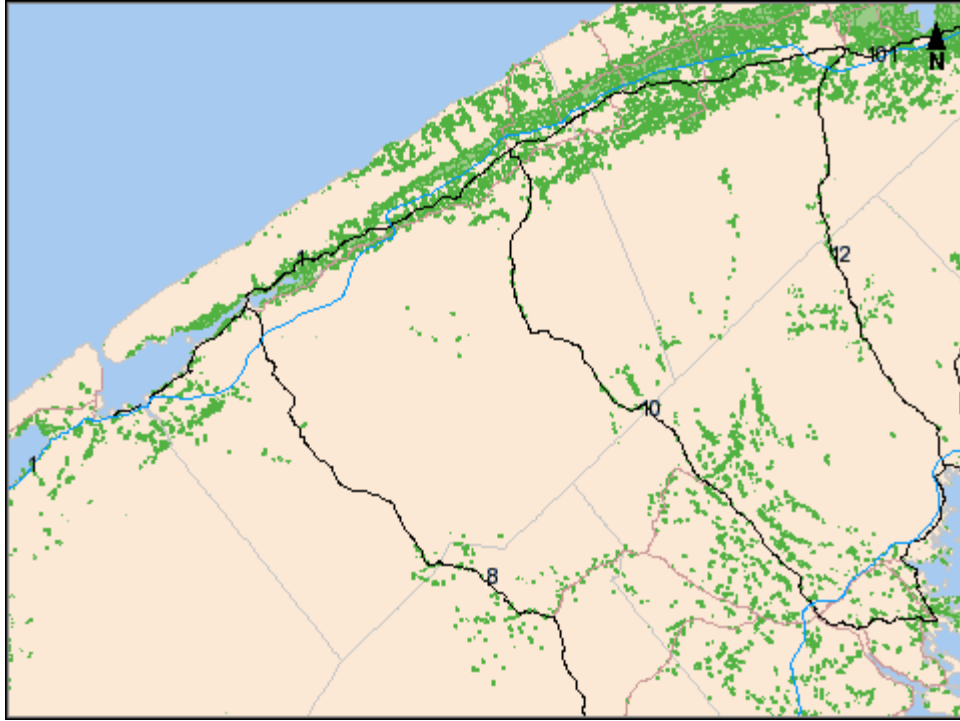


Figure 24. Agricultural areas (in green) surrounding the Medway District.¹²

High Conservation Value Identified:

None of the evidence discussed above suggests that rivers and streams are being significantly impacted by forest management activities. However, provincial regulations (Wildlife Habitat and Watercourse Protection Regulations 2002) require SMZs on all watercourses greater than 50cm in width with the objective to protect these watercourses from sedimentation and increases in temperature. NSDNR recognizes this objective and therefore designates SMZs as HCVs.

Management Strategy:

NSDNR will continue to recognize the value of water quality through the application of SMZs (Table 2).

GIS is used to manage watercourse information and to consider the depth-to-water table in planning harvest openings and road building work instructions. All known watercourses are indicated on the harvest maps with an associated SMZs.

¹² Atlas of Nova Scotia at http://www.gov.ns.ca/geonova/home/products/softpage/ns_atlas.asp

Contractors are trained to avoid wet areas and to notify their supervisor immediately if an unmapped watercourse is identified during harvest.

Machines are not permitted within MFZs; however, all trees should be harvested to prevent obstruction within the stream from blown down trees and sediment from the root mats of blown down trees entering the stream. MFZs are established along watercourses that are on average less than 50cm in width.

The locations of new roads, culverts, and bridges are planned using the wet areas mapping (WAM) model. This information aids in determining the placement of roads to avoid potential interference with water flow. In addition, a right-of-way harvested to install a bridge over a watercourse is kept to a minimum width to ensure shade cover.

14. Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?

As noted under Question 13, the Medway District is situated within various watersheds as shown in Figure 22. The most significant landscape feature that mediates flooding is the presence and function of wetlands since their hydrological role is vital in controlling water flow.

Based upon NSDNR’s forest resource inventory (FRI), the amount, distribution, and classification of wetlands has been updated for the Medway District with available information that approximately doubles the amount of wetland area and significantly increases the amount of forested wetland.

Wetlands that have all or a portion of their area in the Medway District cover approximately 12,000 ha, with nearly 9,800 ha completely encompassed within the District (Table 9) (Figure 25).

Table 9. Wetland types within the Medway District.

Wetland Type	Portion or all in Medway District(ha)	Medway District only (ha)
Peatland (Bog or Fen)	5776.7	4656.2
Fen	2209.0	1468.0
Marsh	732.3	515.5
Swamp	3325.0	3138.1
(Conifer Swamp)	(2200.4)	(2112.7)
(Mixed Wood Swamp)	(535.7)	(521.5)
(Hardwood Swamp)	(311.3)	(296.1)
(Tall Shrub Swamp)	(160.2)	(112.6)
(Undetermined Swamp)	(117.4)	(95.2)
Open Water	208.3	1.9
Total	12251.3	9779.7

Wetlands have often been characterized as providing flood reduction services, but the extent to which this occurs is related to environmental setting, wetland type, size and location relative to the drainage network, and time of year (see: Bullock and Acreman, 2003; Acreman and Holden, 2013). Storage capacity and ability to attenuate flows in response to rain events is typically low in bogs due to their high saturation levels. Furthermore, many bogs are also closed endorheric systems and do not contribute to river flow. The type of vegetation can, however, have a significant effect on flow of water across wetlands and hence flood generation (Holden et al., 2007, 2008), and wooded wetlands (swamps) associated with floodplains can increase flood

storage and reduce flood peaks and flood wave speed (Thomas and Nisbet, 2007) due to vegetation roughness and increased surface area. Within the Medway District, approximately 32 percent (3,138 ha) of wetland area are forested swamps and are considered to directly contribute to flood abatement and water quality maintenance.

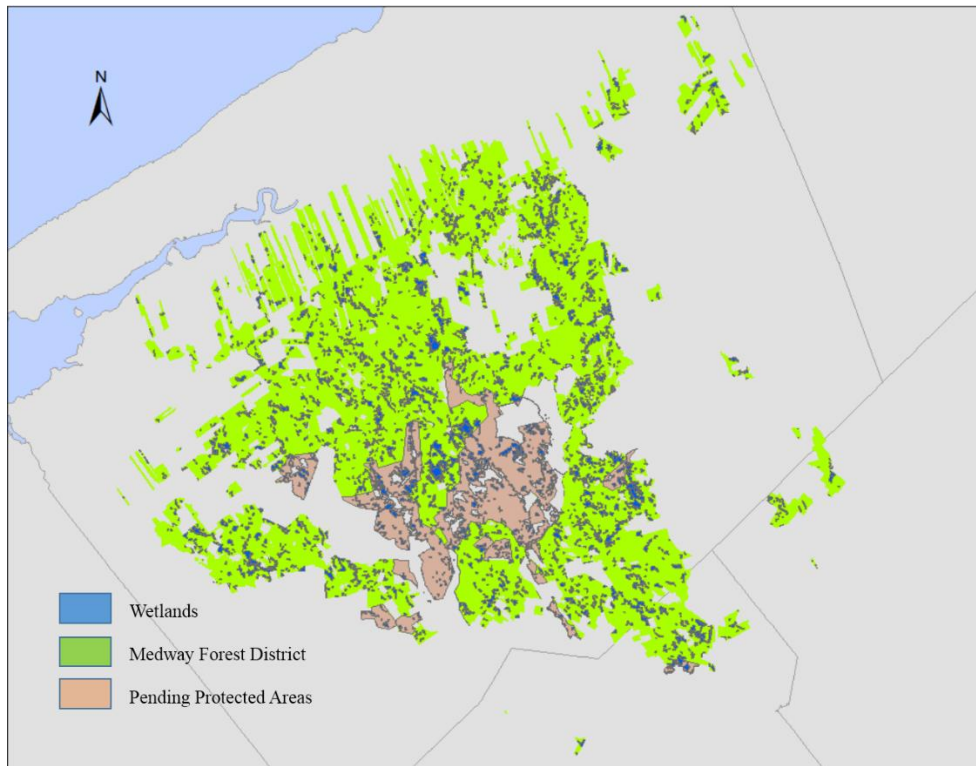


Figure 25. Wetland distribution within the Medway District and pending protected areas.

High Conservation Value Identified:

All wetlands will be considered HCVs.

Management Strategy:

Although all wetlands are considered HCVs, their management strategies will differ depending on their size and character. The IRM review process will assess the potential impact of harvest operations on wetlands and prescribe measures to be taken to maintain their conservation value.

Forest management will be guided by, and conform to, the Nova Scotia Wetland Conservation Policy (September, 2011).

Forestry operations will conform to measures required to minimize ground disturbance found in the Standard Operating Procedure for Operation of Off-Road Vehicles.

Activities within designated Wilderness Areas, Nature Reserves, and Provincial Parks will adhere to their respective Acts and Regulations.

15. Are there forests critical to erosion control?

Slope and soil characteristics are key contributors to risk of soil erosion. Soil erosion can result in loss of productive land and sedimentation in watercourses. Pre-treatment assessments that include determination of FEC soil type will generally identify sites with increased erosion hazard on a stand-by-stand basis. Where these soils occur, best management practices recommend minimizing mineral soil exposure during harvest and silviculture operations (Neily et al., 2013). In addition, according to provincial Wildlife Habitat and Watercourse Protection Regulations, SMZs established along watercourses are to be increased by 1m for every 2 percent increase in slope above 20 percent to reduce erosion risk (to a maximum of 60m)

To identify areas that are potentially critical to erosion control, a new digital erosion hazard map was utilized (Keys et al., 2014). This map, developed by NSDNR and Dalhousie University for watershed and land-use planning, classifies land as having low, moderate, or high inherent erosion hazard based on soil characteristics and slope class. Based on this map, approximately 86.9 percent of the Medway District is classed as low hazard, 12.6 percent as moderate hazard, and 0.5 percent as high hazard (Figure 26). Coarse-textured Gibraltar soils dominate the Medway District and make up the majority of low hazard area. In general, these soils would only be associated with high erosion hazard on steep slopes (> 30 percent) which are typically inoperable. The majority of high hazard area is found in pockets outside of the main Medway District and is associated with shallow and/or silty soils. HCVF would be associated with a portion of these areas found near mapped surface water bodies (e.g., Figures 26 and 27)

High Conservation Value Identified:

There is approximately 413 ha (0.5 percent) of land within the Medway District mapped as having high erosion hazard based on a combination of soil characteristics and slope. However, only a portion of this area is associated with operable slopes (under 30 percent) and nearby surface water. Forest land in these areas would be considered HCVF.

Management Strategy:

Areas identified for possible HCVF designation will be verified by field checks as they are scheduled for management treatments. Activities in identified HCVF lands will be subject to minimum limits on mineral soil exposure, rutting, and compaction that could promote erosion and sedimentation of nearby water bodies. These limits will be determined on a site-by-site basis based on results of pre-treatment assessment.

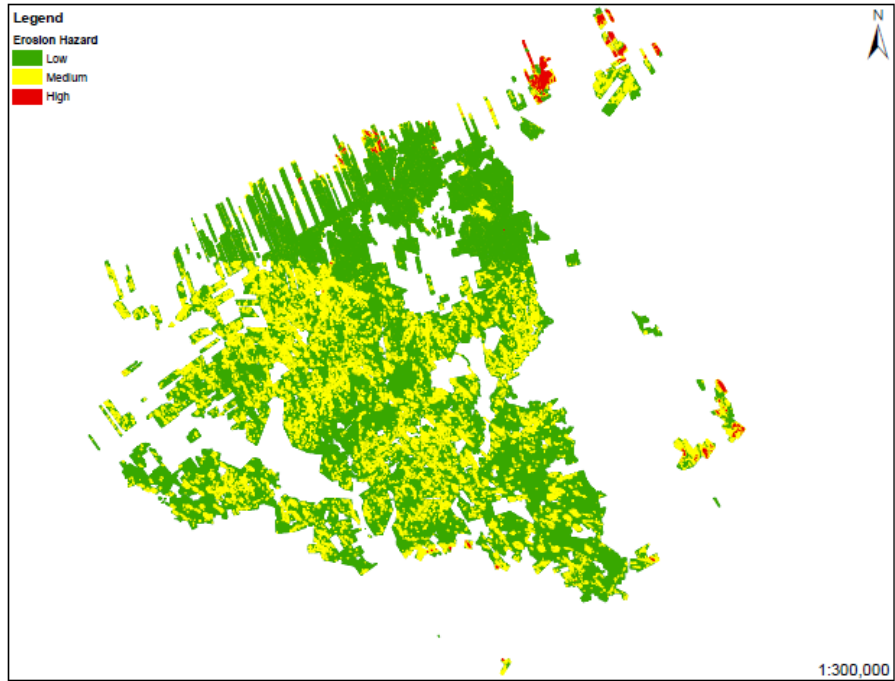


Figure 26. Map showing distribution of erosion hazard areas in the Medway District based on soil characteristics and slope class.

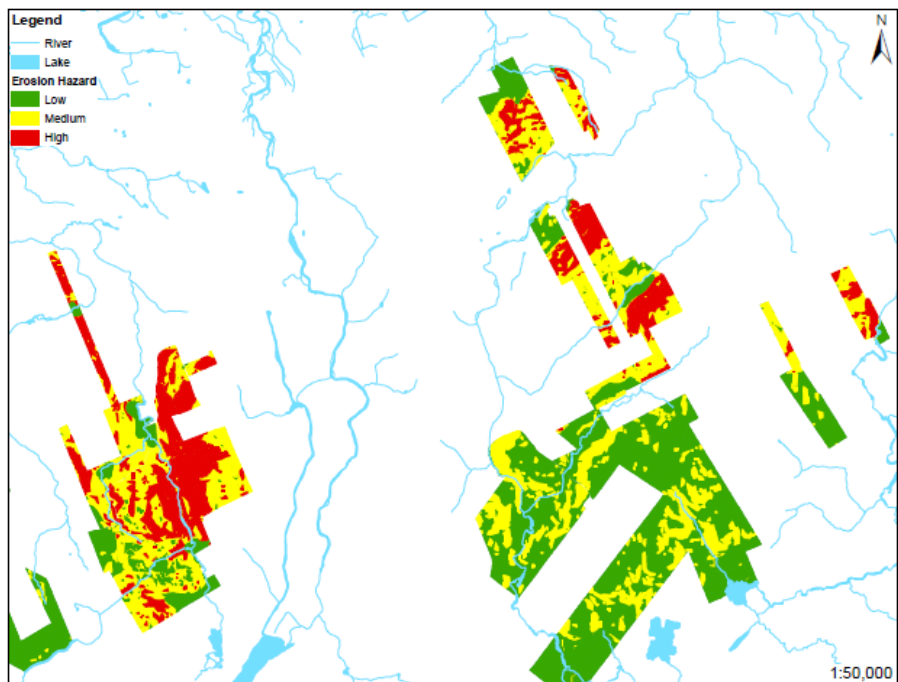


Figure 27. Map of the northeastern Medway District showing pockets of high erosion hazard land and mapped waterbodies.

16. Are there “interface” forests that play a significant role determining the potential spread of wildfires into developed areas or other areas where fire would be harmful?

This question addresses the concern of where fires might start and how developed the surrounding area might be. No large population centres are threatened by wildfire should one start in the Medway District. Most fires in Nova Scotia are caused by people and the remote nature of the Medway District decreases opportunity for careless people to start a wildfire.

Hurricanes, fire, insect outbreaks, and individual tree senescence are all sources of natural disturbance that shaped and continue to shape the Acadian forest. Neily et al. (2007) present an interpretation of natural disturbance forces that shape forest landscapes including frequent¹³, infrequent¹⁴, gap¹⁵, or open seral.¹⁶ Using this information along with an ecological analysis, an understanding of the “natural” range of development classes and seral stages can be calculated for different ecodistricts across the province. This information provides a guide for land managers to establish landscape level goals with which to manage the landscape.

NSDNR provides an indication of the inherent vulnerability of these ecosystems, but due to a long history of land use in the province, current forests may have changed with respect to their vulnerability to fire (Stewart, 2009).

The Wildfire Management group within NSDNR continues to provide leadership and support in wildfire management. Its program includes providing the necessary resources for managing forest fires, fire prevention and detection, fire training and fire science, fire equipment to support forest fire suppression, and specialized fire equipment fabrication.¹⁷ Crews are hired annually in Queens and Annapolis Counties to fight wildfires. This service is available across the province to protect woodlands from wildfire, which inherently will protect communities.

High Conservation Value Identified:

Since the concept of NDRs is incorporated into the management plan and fire protection is provincially managed and regulated, no HCVs are identified.

Management Strategy:

NSDNR maintains emergency response procedures for forest fire protection and response through annual training and coordination with the Provincial Wildfire Coordination Centre in Shubenacadie.

¹³ Frequent – being stand initiating events shorter than the longevity of the climax species that results in a more even-aged forest

¹⁴ Infrequent – being stand initiating events where the interval between stand initiating events is longer than the longevity of the climax species that results in a more uneven-aged forest

¹⁵ Gap – small scale, continuous, incremental disturbances that results in a more uneven-aged forest landscapes enduring features

¹⁶ Open seral – where site conditions restrict or limit tree growth creating sparse or non-existent forest cover

¹⁷ Nova Scotia Department of Natural Resources Wildfire Management group, <http://www.gov.ns.ca/natr/forestprotection/wildfire>

Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health).

17. Are there local communities that use the forest? (This should include both people living inside the forest area and those living adjacent to it as well as any group that regularly visits the forest.) Is anyone within the community making use of the forest for basic needs/livelihoods? (Consider food, medicine, fodder, fuel, building and craft materials, water, income.)

The typical economic activities in the southwestern region of Nova Scotia are resource-based and include forestry, mixed agriculture, eco-tourism, near-shore coastal fisheries, and mineral prospecting and mining¹⁸.

The Medway District is located in an area of low human population density (0-4 people per square kilometre), and adjacent populated areas such as the Annapolis Valley also have relatively low population density¹⁹ (Figure 28).

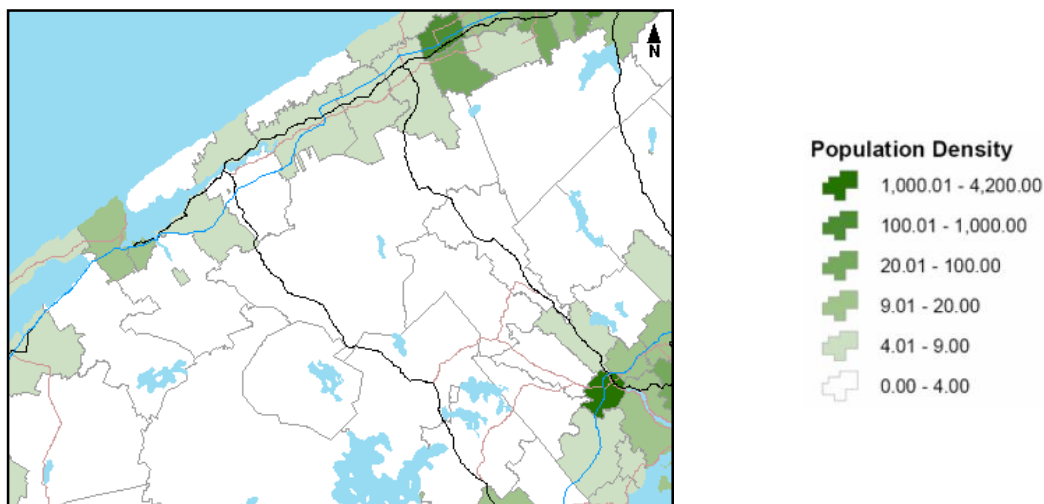


Figure 28. Population density for the area surrounding the Medway District (number of people per square kilometre).

The communities of West Dalhousie, Milford, South Milford, Lake LaRose, Greywood, and Perotte are fully or partially surrounded by portions of the Medway District. These communities rely on the Medway District for direct and indirect employment and for various recreational activities such as fishing, hunting, walking, and nature enjoyment. As well, throughout the region there are various ecotourism businesses that rely on the use of the Medway River for activities such as

¹⁸ UNESCO, 2014- South West Nova, <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/europe-north-america/canada/south-west-nova/>, accessed November 26, 2014.

¹⁹ Nova Scotia Atlas, Province of Nova Scotia, www.geonova.ca, accessed November 26, 2014.

canoeing, kayaking, and angling. The Municipality of Annapolis County actively promotes the recreational use of waterways under the “Canoe Annapolis County” program²⁰. Most canoe routes promoted by Annapolis County have some degree of Medway District lands adjacent to watercourses.

High Conservation Value Identified:

The sustainable management of the Medway District will ensure direct and indirect employment for local communities, so no specific HCV is defined in relation to employment needs. However, recreational use and enjoyment of the Medway District by the local community either as recreation or business can be associated with specific areas, so HCVs have been identified. HCVs have been designated along popular canoe routes, canoe portage trails, boat entry points, and campsites to maintain the integrity of woodland viewsapes.

Management Strategy:

The integrity of viewsapes along frequently used canoe routes will be considered during IRM review and variable buffer widths prescribed to minimize the visual impacts of timber harvesting. All known canoe portages and boating entry points are stored in GIS data layers, identified on the operating plan, and flagged in the field to notify harvesting operators to keep trails free of brush and ensure they are passable (Figure 29).

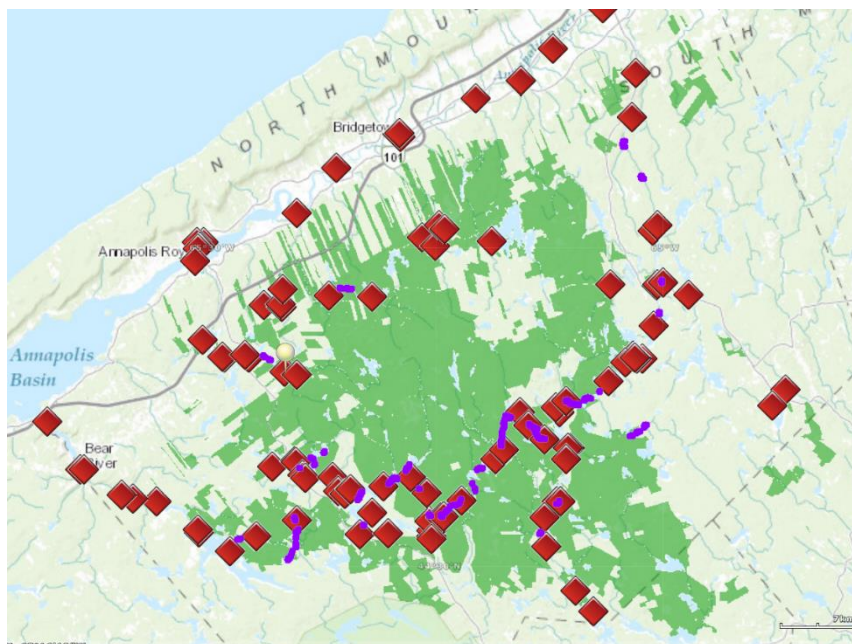


Figure 29. Locations of portage trails (purple) and boat entry points (red diamonds) identified within the Medway District.

²⁰ County of Annapolis, <http://annapoliscounty.ca/community-recreation/waterways-water-access/459-canoe-annapolis-county-guide>, accessed November 26, 2014.

Other benefits of the Medway District that have not been identified as HCVs, but that are important to the local community, include the availability of recreational opportunities through un-gated sections of the Medway District. In 2013/14, NSDNR conducted a strategic review of roads and gates on former Bowater Mersey lands.

The Snowmobilers Association of Nova Scotia does maintain a trail network that runs along some of the Medway District parcels on the eastern edge of the District, however there is no significant overlap ²¹.

Periodic public open houses and work with the Forest Advisory Committee will provide opportunity for the public and interest groups (Canoe/Kayak Nova Scotia, South Shore Paddlers, and Queens County Fish and Game) to highlight any important recreation features in the landscape that require special management. These sites are identified on an on-going basis and stored in GIS data layers for planning purposes. As well, all landowners adjacent to scheduled forest operations are notified prior to harvest, which provides an opportunity for input into the harvest prescription.

Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic, or religious significance identified in cooperation with such local communities).

18. Is the traditional cultural identity of the local community particularly tied to a specific forest area?

Traditional Mi'kmaq territory includes all of present-day Nova Scotia. The Mi'kmaq have had an extensive historic relationship with both French and English settlers of Nova Scotia which continues to this day. The relationship is now framed by Treaty Rights in the Charter of Rights and Freedoms, aboriginal and treaty rights in the Constitution Act, and subsequent important court decisions. There are two Aboriginal First Nations communities near the Medway District. The Bear River First Nation, based in Bear River, has a registered population of 105²². The Annapolis Valley First Nation, located northeast of the Medway District, has a registered population of 281²³. Both of these First Nations are members of the Confederacy of Mainland Mi'kmaq. The locations of Aboriginal communities in Nova Scotia are shown in Figure 30.

²¹ Snowmobilers Association of N.S.- <http://www.snowmobilersns.com/gps-data/>, accessed Nov. 26, 2014

²² Aboriginal Affairs and Northern Development Canada. Community Profile Registered Population as of November 2014, http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/FNPopulation.aspx?BAND_NUMBER=21&lang=eng, accessed November 26, 2014

²³ Aboriginal Affairs and Northern Development Canada. Community Profile Registered Population as of November 2014, http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=20&lang=eng, accessed November 26, 2014.



Figure 30. Location of Aboriginal Communities in Nova Scotia.

In addition to this, many Nova Scotia Mi'kmaq live outside these communities throughout their traditional ancestral areas, and their strong cultural connection to the land and its resources remains. Off-reserve Mi'kmaq consist of approximately 24,900 people and are represented by the Native Council of Nova Scotia which is the self-governing authority for Mi'kmaq/Aboriginal People throughout the Province. It is divided into 13 zones covering the province of Nova Scotia (Figure 31). (<http://ncns.ca/about/our-structure/>).

Within the Native Council, the Netukulimkewe'l Commission is the authority for managing their community's interaction with biodiversity including hunting, fishing, and gathering which community members continue to engage²⁴. Historically, the Mi'kmaq spent most of the year along the sea coast taking advantage of the wealth of food available there during the majority of the year. Fish of all kinds, including salmon and sturgeon, plus sea mammals, lobster, squid, shellfish, eels, and seabird eggs made up the bulk of their diet. They also ate moose, caribou, beaver, porcupine and smaller animals. Berries, roots, and edible plants were gathered during the summer. Several traditional communities of the Native Council of NS reside within the area of the former Bowater Mersey woodlands and continue to use these areas for harvesting resources.²⁵

The discovery and documentation of sites with Mi'kmaq archaeological value is an ongoing process. Data on such sites are recorded in a GIS database maintained by the Department of Communities, Culture and Heritage (CCH). Access to specific point data is strictly controlled in order to protect the sites, and is therefore not presented here. These data are made available to designated staff only within NSDNR.

²⁴ NCNS- December 10, 2014

²⁵ NCNS- R Hunka, written communication, November 24, 2014

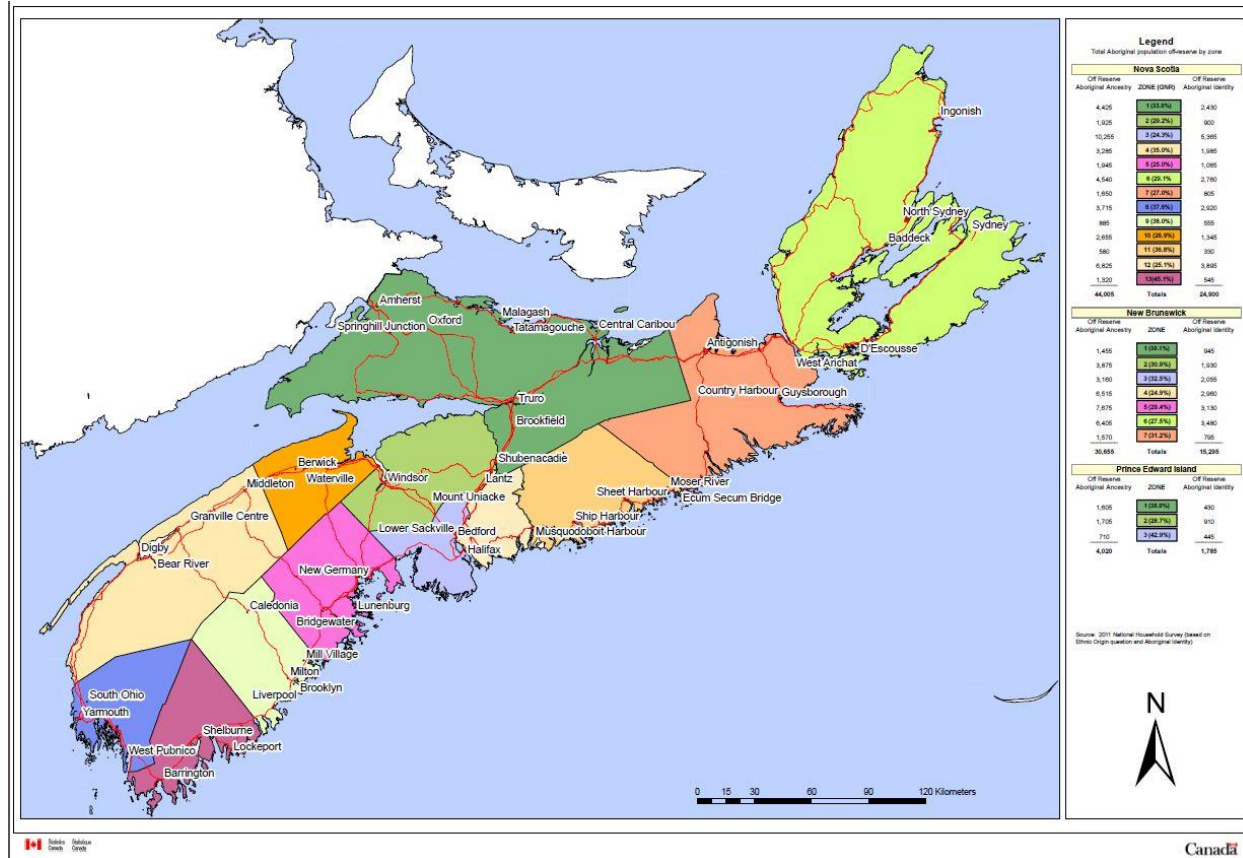


Figure 31. Native Council Governance Zones²⁶

Another area within the Medway District that is culturally significant is the Lohnes Lake Air Crash Memorial site (Figure 32). This site was designated by Bowater Mersey as a “Unique Area” because it has been established as a memorial site for two World War II service men who lost their lives during a training flight when their plane (Mosquito KB126) crashed to the ground. The accident occurred in 1944, and a service was held on September 16, 1997, to remember these crew members and all other pilots and crews who lost their lives during training activities in Nova Scotia during World War II. The site is approximately 2.4 ha. Although NSDNR does not have an equivalent “Unique Areas” program, as a site of cultural significance it therefore remains identified as an HCV.

High Conservation Value Identified:

All sites with confirmed archaeological artifacts as contained in the CCH database are designed as HCVs. The Lohnes Lake memorial site is designated as an HCV.

²⁶ NCNS- provided November 24, 2014



Figure 32. The Lohnes Lake Air Crash Memorial.

Management Strategy:

A Mi'kmaq person, representing the Nova Scotia Native Council, participates on the Forest Advisory Committee.

As part of the IRM process to review and approve harvests on crown land, including the Medway District, proposed harvest areas are screened against the CCH database. This would include sites documented in previous versions of this report. Many sites are located along lake shores and are within the SMZ. These are therefore protected from timber harvesting and road building activities. Also contained in the database are two sites that are considered to be traditional portage trails (BdDh-03-Big River Runs and BdDi-06-Boot Lake) and these will continue to receive further protective action if harvesting operations take place nearby.

As a matter of general practice, planning staff will screen proposed harvest sites against the CCH database. If forest operations are planned near one of these points, staff from CCH will be contacted to determine the appropriate SMZ.

19. Is there a significant overlap of values (ecological and/or cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?

There are no significant overlapping values that individually did not meet HCV thresholds but collectively constitute HCVs.

Conclusion

The Medway District comprising approximately 92,130 ha of Crown coniferous, mixed wood, and deciduous forest has undergone significant changes in management and conservation since it was originally FSC certified in 2010. In this 2015 HCVF update, forest management strategies originally applied in the HCVF have been, for the most part, maintained. The update also includes new HCVs and management strategies that have been enhanced to meet the broader land management and conservation objectives of the Province. These include measures to address recently listed species at risk and significant allocations for protected areas within the Medway District as part of Nova Scotia's Parks and Protected Areas Plan. At present in NSDNR, there are concerted efforts underway to move the management of the Province's forests to a comprehensive landscape scale management system which will support enhanced conservation and resource use. These new approaches, with explicit and balanced values and targets, will further support the ongoing maintenance of HCVF in the Medway District.

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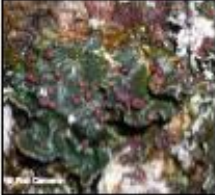

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Appendices

Appendix 1. Species at risk field card.

Species at Risk Field Card		SUSTAINABLE FORESTRY INITIATIVE	April 2015
<p>AMERICAN MARTEN (Cape Breton Population) STATUS: <i>Endangered</i></p> <p>Appearance Slender body with small sharp-pointed head. Rounded ears. Bushy tail and 60-80 cm long.</p> <p>Habitat Mature coniferous forests. Rotten logs, stumps and burrows are used for resting and hunting.</p> 	<p>BLUE FELT LICHEN STATUS: <i>Special Concern</i></p> <p>Appearance Leaf-like rounded lobes and scalloped edges. Lower surface extends beyond surface edge. Reddish spots (apothecia) on surface. Blue-grey in colour, more grayish when dry. Numerous reddish apothecia on surface. Felt-like covering with tiny white hairs.</p> <p>Habitat Cool, humid, coastal mixedwood forest. Grows on Red Maple or Sugar Maple trees.</p> 		
<p>BLANDING'S TURTLE STATUS: <i>Endangered</i></p> <p>Appearance High-domed helmet shaped shell that is dark grey to black with yellowish flecks. Bright yellow chin and throat. 20-25 cm in length.</p> <p>Habitat Freshwater wetlands. Dark, slow moving waters with muddy bottoms and dense aquatic vegetation. Use exposed sandy and gravelly areas for nesting.</p> 	<p>EASTERN MOOSE (Mainland Population) STATUS: <i>Endangered</i></p> <p>Appearance Largest member of the deer family. Short necks, broad over-hanging muzzle and long ears. Brown to brown-black to grey.</p> <p>Habitat Boreal and mixed wood forests. In spring, islands of trees are used for calving. In summer, access to wetlands is important.</p> 		
<p>WOOD TURTLE STATUS: <i>Vulnerable</i></p> <p>Appearance Bumpy, sculpted shell that is dark grey to brown with orange markings when wet. Skin is orange-red or black. 16-21 cm in length.</p> <p>Habitat Clear, moderately moving rivers, tributaries in forests and river adjacent pastures and forests.</p> 	<p>BLACK ASH STATUS: <i>Special Concern</i></p> <p>Appearance Deciduous tree with DBH typically 5-30 cm. Compound opposite leaves, finely toothed from top to bottom with no stem. Mature bark is ridged, corky and easily indented by fingernail.</p> <p>Habitat Seasonally flooded swampy mixedwood or hardwood forests. Prefers nutrient rich sites (floodplains, along streams, base of hardwood slopes).</p> 		
<p>BOREAL FELT LICHEN STATUS: <i>Endangered</i></p> <p>Appearance Leaf-like with upturned edges that are white. Green when wet or dark grey when dry. Red spots (apothecia) on the surface. Felt-like covering with tiny white hairs.</p> <p>Habitat Balsam fir stands near coast and in cool, moist habitat near wetlands.</p> 	<p>EASTERN WHITE CEDAR STATUS: <i>Vulnerable</i></p> <p>Appearance Ever green tree. Flattened branches with small scale-like leaves. Small scaly seed cones in bunches. Reddish brown bark.</p> <p>Habitat Riparian areas along streams, swamps, and lakeshores. In cool, moist forested habitats that are productive.</p> 		
<p>VOLE EARS LICHEN STATUS: <i>Endangered</i></p> <p>Appearance Leafy with large lobes, lighter grey-brown (dry) or grey-green (wet). Granular (soredia) around lobe margins, on top. Upper surface covered in fine hairs.</p> <p>Habitat Mature coniferous or mixed coastal forest with high rainfall. It grows on Balsam Fir, Red Maple or Yellow Birch.</p> 			

These species tend to exist within a forested habitat. There are other species at risk found in other habitat types not provided on this sheet. Please refer to the guidebook titled *Species at Risk in Nova Scotia: Identification and Information Guide*. <http://www.spoetecatrisk.ca/SARGuide/>. Contact MTRF or NSDNR to learn about obtaining a copy of the guide.

CHIMNEY SWIFTSTATUS: *Threatened***Appearance**

Long wings relative to body ("cigar with wings"). Brown with paler throat. Always flying Swallow-sized.

**Habitat**

Open areas, cut over areas. **Nest:** Single nests inside standing hollow logs, chimneys or abandoned buildings

Detection tip

Look for individuals or groups leaving from, or returning to, nest site at dawn and dusk

Most Sensitive

June 1 to July 31

**COMMON NIGHTHAWK**STATUS: *Threatened***Appearance**

White wing patch on under side. Long, pointy wings. Usually seen in flight, Falcon-sized.

Habitat

Woodland cut over areas and open areas **Nest:** Eggs laid on ground

Detection tip

Active at dusk
One note call: a nasal "peert"

Most sensitive

May 15 – July 31

**CANADA WARBLER**STATUS: *Threatened***Appearance**

White eye-ring, Black "necklace", Yellow throat and belly, Chickadee-sized.

Habitat

Mixed-aged, mixed-species stands, canopy gaps, damp or wet forests, thick understorey or shrub layer
Nest: Cup of grass, leaves and plant fibres Concealed on or near ground in an upturned tree root, rotting stump or moss hummock

Detection tip

Secretive, identified by song but requires practice (begins with a single chip followed by a jumble of notes)

Most sensitive: June 1 – July 31

**BARN SWALLOW**STATUS: *Threatened***Appearance**

Long pointed wings, deeply forked tail. Upperparts, cobalt blue, its forehead and neck reddish brown, under parts, lighter orange-brown. Partial blue band across the chest.

Habitat

Feed over wetlands, lakes, rivers and forests. **Nest:** Muddy bowl often inside buildings and under eaves.

Most sensitive

June 1 – July 31

**RUSTY BLACKBIRD**STATUS: *Threatened***Appearance**

Like a grackle with a short tail
Male black, Female brown. Yellow eye, Starling-sized.

Habitat

Forest wetlands (beaver dams, bogs, marshes) **Nest:** Low (<3m) and near water. In stumps, shrubs and dead trees. Bulky cup of twigs, moss and grass

Detection tip

Plain compared to other blackbirds (e.g., lack red shoulder patches of Red-winged Blackbird)

Most sensitive

May 15 – July 31

**OLIVE-SIDED FLYCATCHER**STATUS: *Threatened***Appearance**

Olive-brown sides contrast with white belly ("vest"), Blackbird-sized.

Habitat

Wetland or cut over areas bordered by spruce **Nest:** On horizontal branches of conifer trees at various heights. "Flat" cup of moss and twigs

Detection tip

Often catches insects from tree tops
Song is distinctive "Quick, free beers!"

Most sensitive

June 15 – July 31

**LITTLE BROWN BAT, LONG EARED BAT, TRI-COLOURED BAT**STATUS: *Endangered***Appearance**

It is difficult to distinguish between these three bat species. Report general bat sightings to www.batconservation.ca. Report dead or nuisance bats to NSDNR.

Habitat

Females form maternity colonies in the summer. Feed from dusk until dawn over a variety of habitats including forests, forest edges, rivers and lakes. Tri-coloured bats roost in clumps of Old Man's Beard Lichen

**EASTERN RIBBONSNAKE**STATUS: *Threatened***Appearance**

Semi-aquatic. Solid black with 3 yellow stripes, caramel brown on underside. White tear drop scales in front of each eye

Habitat

Freshwater wetlands such as stillwater streams, marshes, and swamps. They have been observed overwintering in upland forests adjacent to wetlands

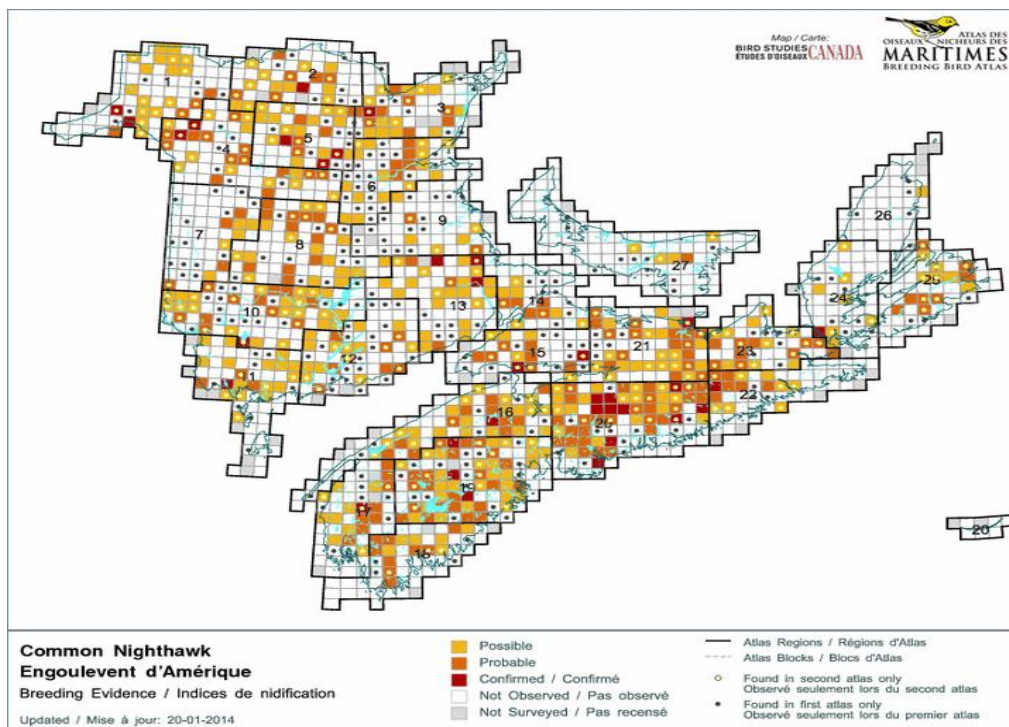
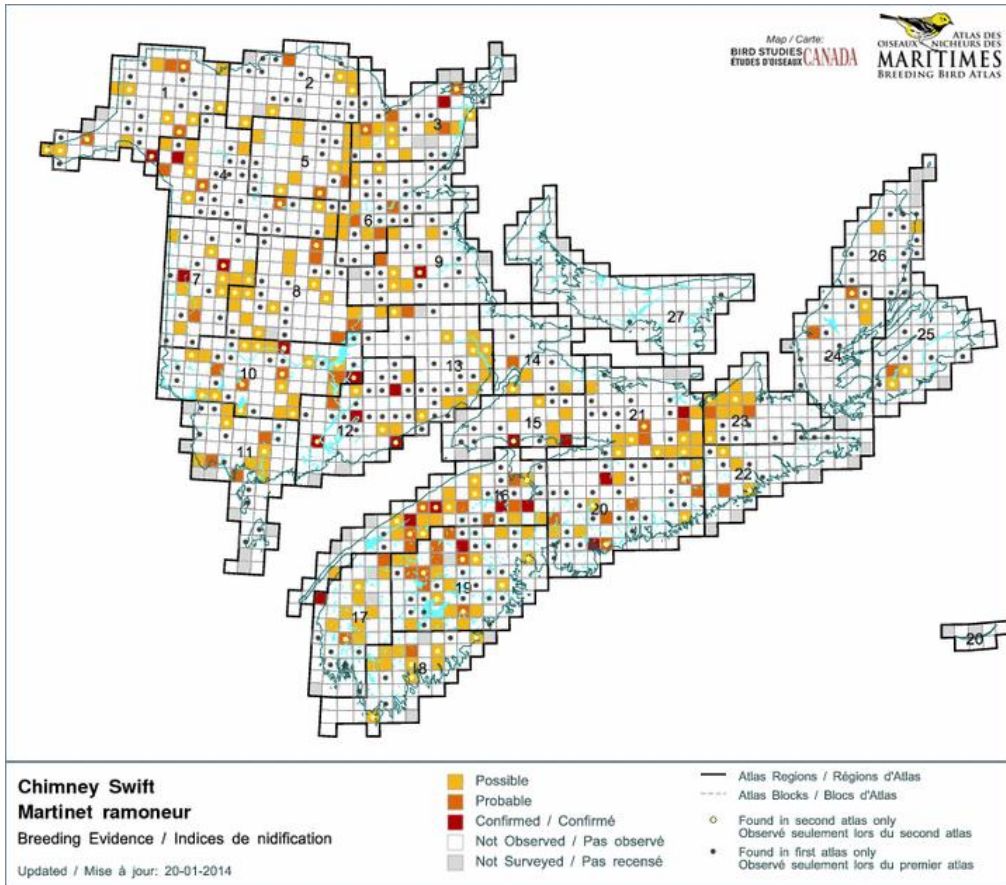


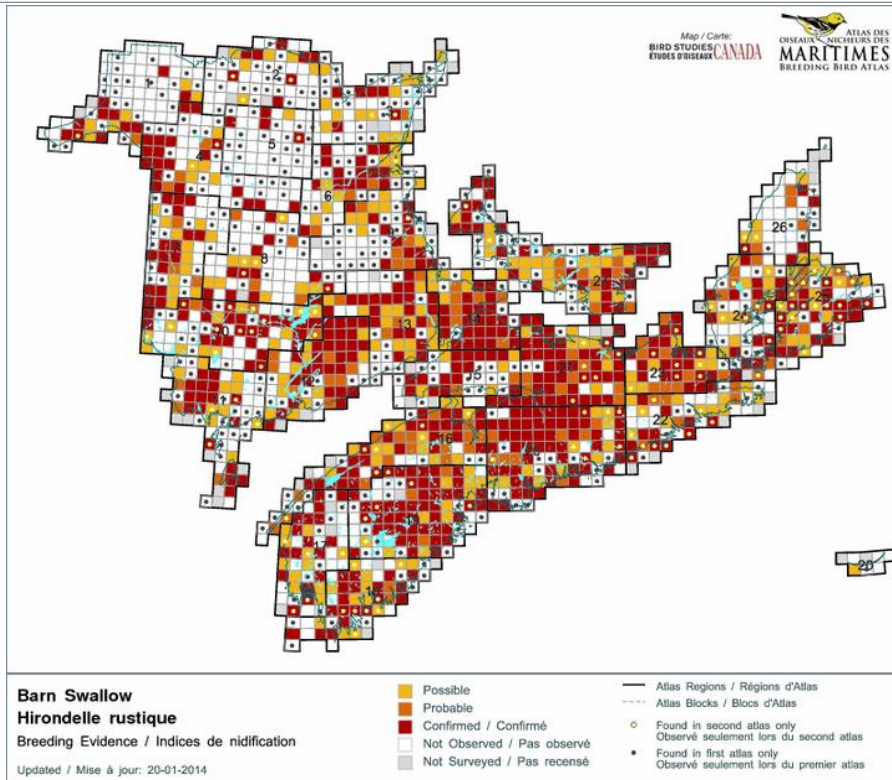
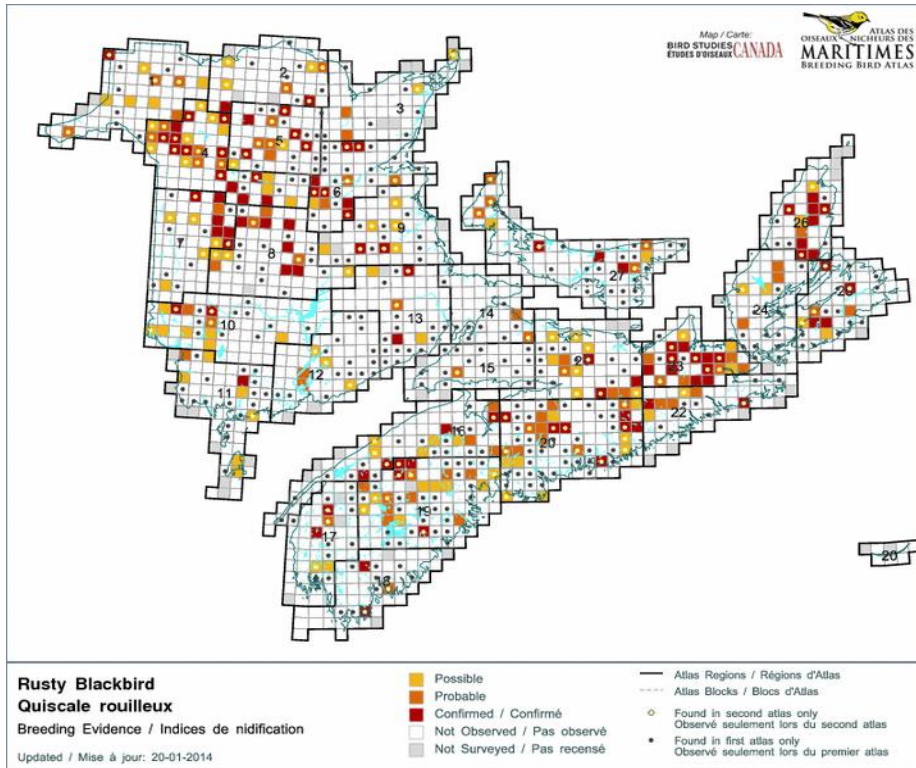
These species tend to exist within a forested habitat. There are other species at risk found in other habitat types not provided on this sheet. Please refer to the guidebook titled *Species at Risk in Nova Scotia: Identification and Information Guide*. <http://www.speciesatrisk.ca/SARGuide/>. Contact MTRJ or NSDNR to learn about obtaining a copy of the guide.

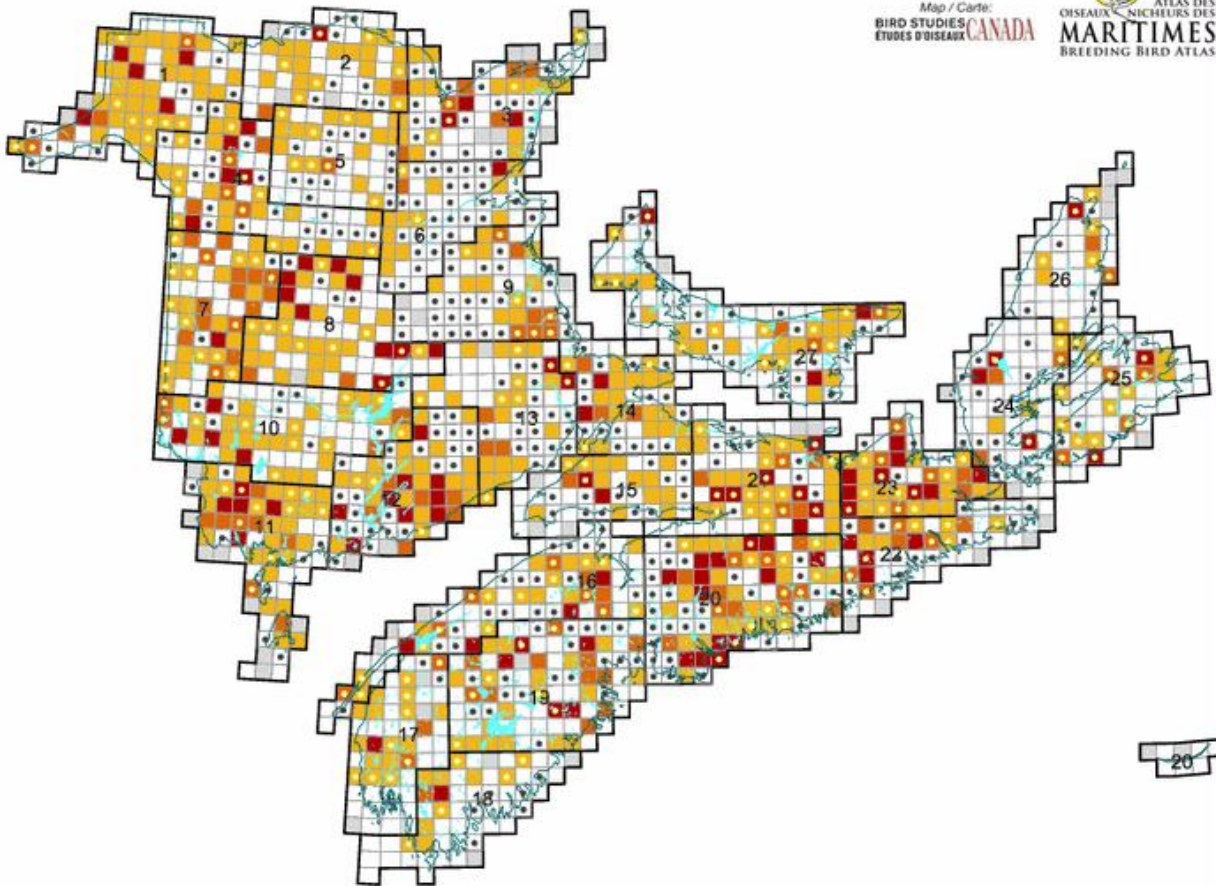
Appendix 2. Forest habitat suitability ranking for American marten.

Stand Type	Suitability Ranking for American Marten habitat				
	Regeneration	Young	Maturity Class		Overmature
			Immature	Mature	
Hemlock	0	0	1	2	3
Pi	0	0	1	3	3
Spruce	0	0	1	3	3
SW	0	0	1	3	3
SH	0	0	1	3	3
hw	0	0	0	0	0
hs	0	0	0	0	0
mw	0	0	1	2	3
	If above >= 1				
Selection Cut	1				
Shelterwood	1				
Other Modified	1				
Variable Retention, I	0				
Pi Seed	0				
Ccut	0				

Appendix 3. Selected maps from the Maritimes Breeding Bird Atlas (Steward, R. L. M. et al. 2015)







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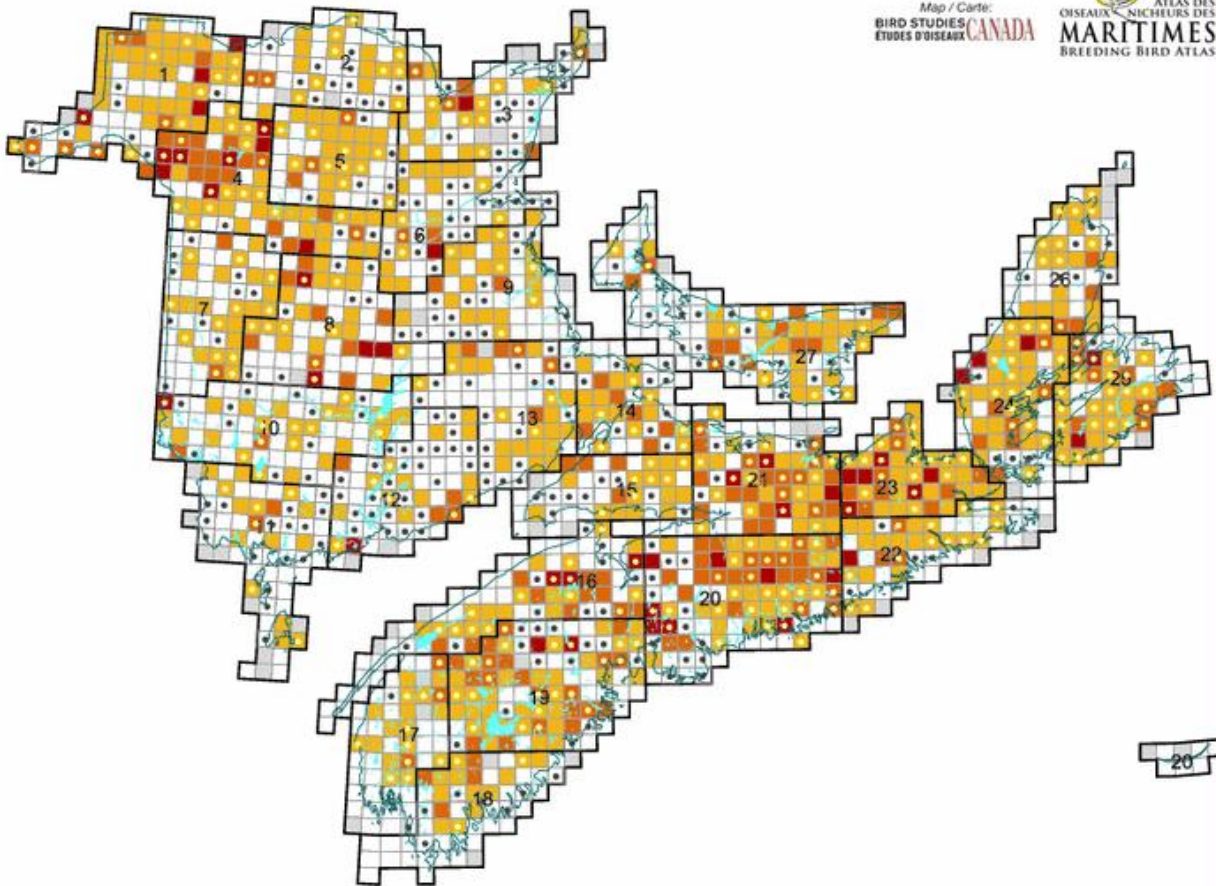
Canada Warbler
Paruline du Canada

Breeding Evidence / Indices de nidification

Updated / Mise à jour: 20-01-2014

- Possible
- Probable
- Confirmed / Confirmé
- Not Observed / Pas observé
- Not Surveyed / Pas recensé

- Atlas Regions / Régions d'Atlas
- Atlas Blocks / Blocs d'Atlas
- Found in second atlas only
Observé seulement lors du second atlas
- Found in first atlas only
Observé seulement lors du premier atlas



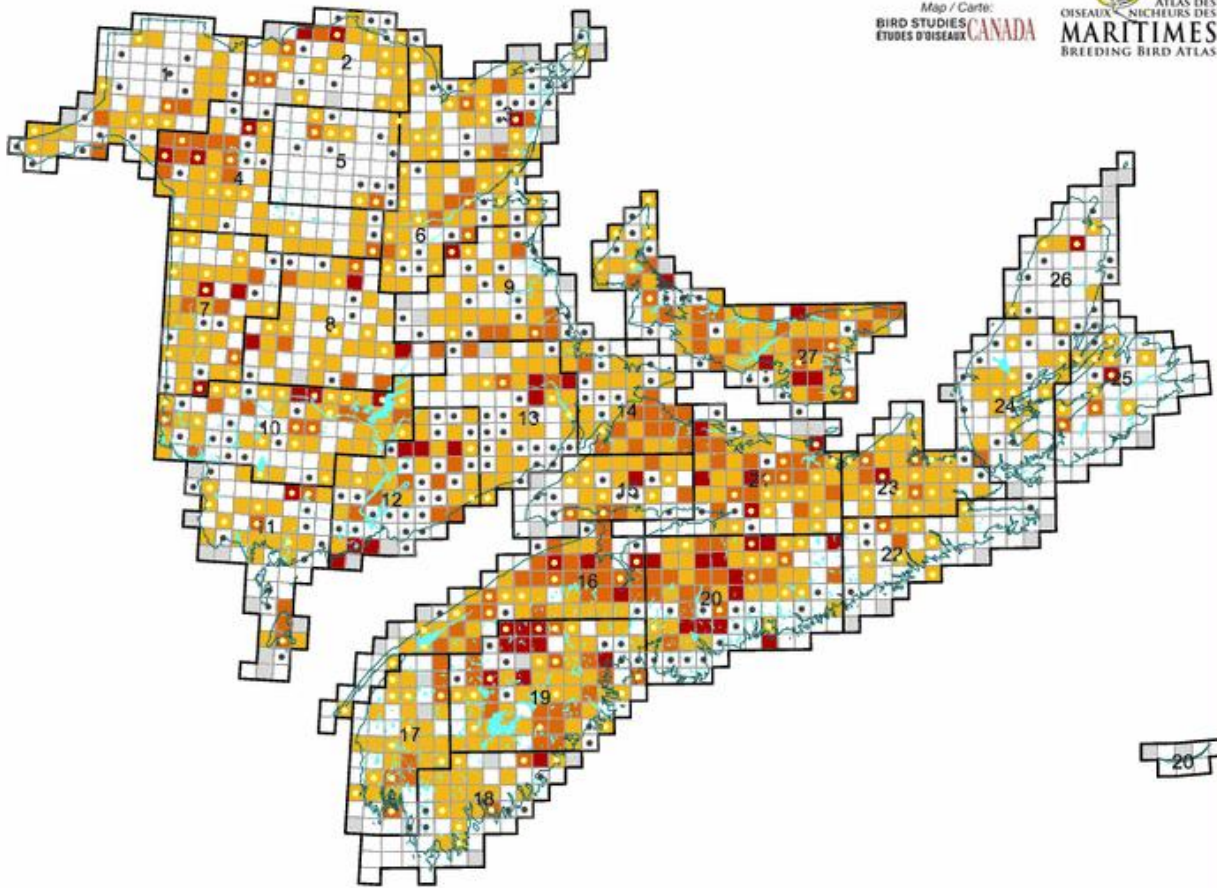
20

Olive-sided Flycatcher
Moucherolle à côtés olive
Breeding Evidence / Indices de nidification

Updated / Mise à jour: 20-01-2014

- Possible
- Probable
- Confirmed / Confirmé
- Not Observed / Pas observé
- Not Surveyed / Pas recensé

- Atlas Regions / Régions d'Atlas
- - - Atlas Blocks / Blocs d'Atlas
- ◇ Found in second atlas only
Observé seulement lors du second atlas
- Found in first atlas only
Observé seulement lors du premier atlas



Eastern Wood-Pewee
Pioui de l'Est

Breeding Evidence / Indices de nidification

Updated / Mise à jour: 20-01-2014

- Possible
- Probable
- Confirmed / Confirmé
- Not Observed / Pas observé
- Not Surveyed / Pas recensé

- Atlas Regions / Régions d'Atlas
- - - Atlas Blocks / Blocs d'Atlas
- ◇ Found in second atlas only
 Observé seulement lors du second atlas
- Found in first atlas only
 Observé seulement lors du premier atlas

Appendix 4. Precise and imprecise records for Species of Conservation Concern (may be at risk species and sensitive species) known from the Medway District area and from protected areas within the Medway District based on the ACCDC database up to 2014.

<u>Scientific name</u>	<u>Common Name</u>	<u>Status</u>	<u>Medway</u>	<u>Protected</u>
<i>Icterus galbula</i>	Baltimore Oriole	May Be At Risk	1	0
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	May Be At Risk	1	0
<i>Anas discors</i>	Blue-winged Teal	May Be At Risk	1	0
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	May Be At Risk	3	0
<i>Dumetella carolinensis</i>	Gray Catbird	May Be At Risk	8	0
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	May Be At Risk	1	0
<i>Carex ormostachya</i>	Necklace Spike Sedge	May Be At Risk	1	1
<i>Pinicola enucleator</i>	Pine Grosbeak	May Be At Risk	2	0
<i>Progne subis</i>	Purple Martin	May Be At Risk	1	0
<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	May Be At Risk	1	0
<i>Chrysops nigripes</i>	Taiga Deer Fly	May Be At Risk	1	0
<i>Botaurus lentiginosus</i>	American Bittern	Sensitive	6	0
<i>Dendroica castanea</i>	Bay-breasted Warbler	Sensitive	10	1
<i>Anzia colpodes</i>	Black-foam Lichen	Sensitive	3	3
<i>Dendroica striata</i>	Blackpoll Warbler	Sensitive	1	0
<i>Galium obtusum</i>	Blunt-leaved Bedstraw	Sensitive	1	0
<i>Poecile hudsonica</i>	Boreal Chickadee	Sensitive	4	0
<i>Goodyera pubescens</i>		Sensitive	8	4
<i>Dendroica tigrina</i>	Cape May Warbler	Sensitive	1	0
<i>Tyrannus tyrannus</i>	Eastern Kingbird	Sensitive	6	0
<i>Sayornis phoebe</i>	Eastern Phoebe	Sensitive	3	1
<i>Regulus satrapa</i>			20	3
<i>Perisoreus canadensis</i>	Gray Jay	Sensitive	19	2
<i>Charadrius vociferus</i>	Killdeer	Sensitive	5	0
<i>Goodyera repens</i>		Sensitive	1	0
<i>Dichantherium linearifolium</i>		Sensitive	2	0
<i>Carduelis pinus</i>	Pine Siskin	Sensitive	9	0
<i>Pheucticus ludovicianus</i>		Sensitive	7	0
<i>Regulus calendula</i>	Ruby-crowned Kinglet	Sensitive	14	2
<i>Actitis macularius</i>	Spotted Sandpiper	Sensitive	8	1
<i>Carex swanii</i>	Swan's Sedge	Sensitive	2	0
<i>Carex tenera</i>	Tender Sedge	Sensitive	1	0
<i>Vermivora peregrina</i>	Tennessee Warbler	Sensitive	2	0
<i>Tachycineta bicolor</i>	Tree Swallow	Sensitive	28	2
<i>Enallagma vesperum</i>	Vesper Bluet	Sensitive	1	0
<i>Gallinago delicata</i>	Wilson's Snipe	Sensitive	9	0
<i>Wilsonia pusilla</i>	Wilson's Warbler	Sensitive	1	0
<i>Eleocharis olivacea</i>	Yellow Spikerush	Sensitive	1	0
<i>Empidonax flaviventris</i>		Sensitive	9	0
		Total Number of Records	203	20
		Total Number of Species	39	10

Appendix 5. Precise records for Species of Conservation Concern (may be at risk species and sensitive species) known from the Medway District area and from protected areas within the Medway District based on the ACCDC database up to 2014.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Status</u>	<u>Medway</u>	<u>Protected</u>
	Necklace Spike			
<i>Carex ormostachya</i>	Sedge	May Be At Risk	1	1
<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	May Be At Risk	1	0
<i>Chrysops nigripes</i>	Taiga Deer Fly	May Be At Risk	1	0
	Bay-breasted			
<i>Dendroica castanea</i>	Warbler	Sensitive	1	0
<i>Galium obtusum</i>	Blunt-leaved Bedstraw	Sensitive	1	0
<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain	Sensitive	8	4
<i>Regulus satrapa</i>	Golden-crowned Kinglet	Sensitive	2	0
<i>Goodyera repens</i>	Lesser Rattlesnake-plantain	Sensitive	1	0
<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass	Sensitive	1	0
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	Sensitive	1	0
	Ruby-crowned			
<i>Regulus calendula</i>	Kinglet	Sensitive	1	0
<i>Carex swanii</i>	Swan's Sedge	Sensitive	2	0
<i>Carex tenera</i>	Tender Sedge	Sensitive	1	0
<i>Eleocharis olivacea</i>	Yellow Spikerush	Sensitive	1	0
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	Sensitive	3	0
		Total Number of Records	26	5
		Total Number of Species	15	2

Appendix 6. All Records for Species of Conservation Concern (may be at risk species and sensitive species) known from the Medway District area and buffered by 5km based on the ACCDC database up to 2014.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Status</u>	<u>Medway</u>
<i>Anopholis americana</i>	American Cancer-root	May Be At Risk	8
<i>Caulophyllum thalictroides</i>	Blue Cohosh	May Be At Risk	1
<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen	May Be At Risk	1
<i>Somatochlora forcipata</i>	Forcipate Emerald	May Be At Risk	1
<i>Anas strepera</i>	Gadwall	May Be At Risk	20
<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed	May Be At Risk	3
<i>Desmodium glutinosum</i>	Large Tick-Trefoil	May Be At Risk	2
<i>Carex laxiflora</i>	Loose-Flowered Sedge	May Be At Risk	1
<i>Galium boreale</i>	Northern Bedstraw	May Be At Risk	3
<i>Anas acuta</i>	Northern Pintail	May Be At Risk	3
<i>Anas clypeata</i>	Northern Shoveler	May Be At Risk	7
<i>Enallagma signatum</i>	Orange Bluet	May Be At Risk	3
<i>Carex hystericina</i>	Porcupine Sedge	May Be At Risk	1
<i>Fraxinus pennsylvanica</i>	Red Ash	May Be At Risk	1
<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail	May Be At Risk	1
<i>Juncus secundus</i>	Secund Rush	May Be At Risk	1
<i>Schoenoplectus torreyi</i>	Torrey's Bulrush	May Be At Risk	3
<i>Pannaria lurida</i>	Veined Shingle Lichen	May Be At Risk	1
<i>Allium tricoccum</i>	Wild Leek	May Be At Risk	2
<i>Tringa semipalmata</i>	Willet	May Be At Risk	16
<i>Stylurus scudderi</i>	Zebra Clubtail	May Be At Risk	1
<i>Salmo salar</i>	Atlantic Salmon	May Be At Risk	1
<i>Spiranthes lucida</i>	Shining Ladies'-Tresses	May Be At Risk	2
<i>Naemia seriata</i>	a Ladybird beetle	Sensitive	4
<i>Isoetes acadensis</i>	Acadian Quillwort	Sensitive	3
<i>Hedeoma pulegioides</i>	American False Pennyroyal	Sensitive	2
<i>Picoides arcticus</i>	Black-backed Woodpecker	Sensitive	6
<i>Leptogium corticola</i>	Blistered Jellyskin Lichen	Sensitive	2
<i>Polygala sanguinea</i>	Blood Milkwort	Sensitive	2
<i>Salvelinus fontinalis</i>	Brook Trout	Sensitive	2
<i>Teucrium canadense</i>	Canada Germander	Sensitive	2
<i>Spiranthes casei var. novaescotiae</i>	Case's Ladies'-Tresses	Sensitive	2
<i>Polygonum scandens</i>	Climbing False Buckwheat	Sensitive	2
<i>Cephalanthus occidentalis</i>	Common Buttonbush	Sensitive	29
<i>Somatochlora franklini</i>	Delicate Emerald	Sensitive	1
<i>Hypericum dissimulatum</i>	Disguised St John's-wort	Sensitive	1
<i>Margaritifera margaritifera</i>	Eastern Pearlshell	Sensitive	1
<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil	Sensitive	1
<i>Pekania pennanti</i>	Fisher	Sensitive	2
<i>Juncus marginatus</i>	Grassleaf Rush	Sensitive	3
<i>Phalacrocorax carbo</i>	Great Cormorant	Sensitive	1
<i>Tringa melanoleuca</i>	Greater Yellowlegs	Sensitive	2
<i>Minuartia groenlandica</i>	Greenland Stitchwort	Sensitive	3
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	Sensitive	6
<i>Gomphaeschna furcillata</i>	Harlequin Darner	Sensitive	10
<i>Carex houghtoniana</i>	Houghton's Sedge	Sensitive	4

<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid	Sensitive	2
<i>Pieris oleracea</i>	Mustard White	Sensitive	5
<i>Boyeria grafiana</i>	Ocellated Darner	Sensitive	3
<i>Podilymbus podiceps</i>	Pied-billed Grebe	Sensitive	15
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather	Sensitive	1
<i>Epilobium coloratum</i>	Purple-veined Willowherb	Sensitive	1
<i>Eriophorum gracile</i>	Slender Cottongrass	Sensitive	1
<i>Alnus serrulata</i>	Smooth Alder	Sensitive	4
<i>Potamogeton pulcher</i>	Spotted Pondweed	Sensitive	1
<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen	Sensitive	1
<i>Stuckenia filiformis ssp. alpina</i>	Thread-leaved Pondweed	Sensitive	1
<i>Najas gracillima</i>	Thread-Like Naiad	Sensitive	1
<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster	Sensitive	1
<i>Empidonax traillii</i>	Willow Flycatcher	Sensitive	5
<i>Anemone quinquefolia</i>	Wood Anemone	Sensitive	4
<i>Juncus subcaudatus var. planisepalus</i>	Woods-Rush	Sensitive	1
		Total Number of Records	223
		Total Number of Species	62

Appendix 7. Representation of Old Forest Policy land within ELC ecodistricts (data update Forest Model 2014).

Ecodistrict	Element	Total Area of Forest LC>=3 (ha)	Area of Crown Forest LC>=3 (ha)	Area of Old Forest Policy (ha)	Percent of Crown in Old Forest Policy (%)	Difference between Area Required and Identified in Old Forest Policy (ha)	Area of Medway FSC Block (ha)
720	Red and Black Spruce Hummocks	255979	168283	47039	28.0		63141
720	Spruce Hemlock Pine Hummocks and Hills	73299	33039	6810	20.6		8618
720	Spruce Pine Flats	19966	12173	5129	42.1		3496
720	Spruce Pine Hummocks	1029	923	666	72.2		300
720	Tolerant Hardwood Hills	2057	526	8	1.5		19
720	Tolerant Mixedwood Drumlins	12605	8365	2239	26.8		5838
720	Tolerant Mixedwood Hummocks	2923	928	320	34.4		240
720	Wetlands	6578	3829	1347	35.2		2313
720	South Mountain Ecodistrict Total	374436	228065	63558	27.9	-45313	83965
740	Pine Oak Hills and Hummocks	2982	1311	294	22.4		0
740	Spruce Hemlock Pine Hummocks and Hills	64116	17575	7050	40.1		856
740	Spruce Pine Flats	33634	7714	1563	20.3		152
740	Tolerant Mixedwood Drumlins	102949	9742	2645	27.1		660
740	Wetlands	3199	654	194	29.7		73
740	LaHave Drumlines Ecodistrict Total	206879	36996	11746	31.7	-8786	1741
710	Floodplain	226	0	0			0
710	Pine Oak Hills and Hummocks	167	0	0			0
710	Spruce Hemlock Pine Hummocks and Hills	47525	3960	154	3.9		2411
710	Spruce Pine Flats	758	59	0	0.0		19
710	Tolerant Hardwood Hills	15105	2943	162	5.5		1918
710	Tolerant Mixedwood Slopes	4870	154	20	12.8		58
710	Wetlands	181	26	0	0.0		29
710	South Mountain Slopes Ecodistrict Total	68832	7142	335	4.7	236	4435
610	Floodplain	1582	12	0	0.0		0
610	Marshes and Grasslands	279	18	0	0.0		0
610	Pine Oak Flats	7781	517	2	0.5		3
610	Pine Oak Hills and Hummocks	5579	590	13	2.2		12
610	Red and Black Spruce Hummocks	6541	115	0	0.0		0
610	Salt Marsh	36	0	0			0
610	Spruce Hemlock Pine Hummocks and Hills	9889	383	2	0.4		106
610	Spruce Pine Flats	1355	5	0	0.0		0
610	Tolerant Hardwood Hills	127	2	0	0.0		0
610	Wetlands	165	0	0			0
610	Annapolis Valley Ecodistrict Total	33334	1643	17	1.0	114	121
Colour Code Key							
	Ecodistrict Meets Old Forest Policy 8% target						
	Ecodistrict is below Old Forest Policy 8%						
	Element Representation exceeds 8%						
	Element is Represented, below 8%)						
	Element is Not Represented						
	Element does not occur on Crown Land						

Appendix 8. Summary of ecological representation for the four ELC ecodistricts that occur in the Medway District.

South Mountain Ecodistrict 720: Representation of Ecosystems and Elements											
Land Classification Unit		Ecodistrict Land Area		Reserve Land Area in Ecodistrict						Medway Land	
Ecosystem	Element	Ha	% of Ecodistrict	Legal Reserve		Policy Reserve		Total Reserve		Total Area	Reserve Area
				Ha	%	Ha	%	Ha	%	Ha	Ha
ICHO	Red and Black Spruce Hummocks	183,161	44	23,377	12.8	21,530	11.8	44,907	24.5	46579	7454
WCHO	Red and Black Spruce Hummocks	100,053	24	18,615	18.6	13,314	13.3	31,929	31.9	16562	3295
	Element Summary	283,214	67	41,992	14.8	34,844	12.3	76,836	27.1	63141	10749
IMHO	Spruce Hemlock Pine Hummocks and Hills	3,634	1	8	0.2	11	0.3	19	0.5	41	0
WCDS	Spruce Hemlock Pine Hummocks and Hills	408	0	0	0.0	209	51.2	209	51.2	0	0
WCKK	Spruce Hemlock Pine Hummocks and Hills	70,139	17	6,453	9.2	4,589	6.5	11,042	15.7	8105	602
WFHO	Spruce Hemlock Pine Hummocks and Hills	221	0	0	0.0	0	0.0	0	0.0	0	0
WMHO	Spruce Hemlock Pine Hummocks and Hills	3,504	1	97	2.8	0	0.0	97	2.8	473	0
	Element Summary	77906	19	6558	8.4	4809	6.2	11367	14.6	8618	602
ICSM	Spruce Pine Flats	23,531	6	6,687	28.4	769	3.3	7,456	31.7	3496	1
IMSM	Spruce Pine Flats	497	0	0	0.0	0	0.0	0	0.0	0	0
	Element Summary	24,028	6	6,687	27.8	769	3.2	7,456	31.0	3496	0
ICKK	Spruce Pine Hummocks	467	0	0	0.0	326	69.8	326	69.8	0	0
ICRD	Spruce Pine Hummocks	915	0	0	0.0	837	91.5	837	91.5	300	269
	Element Summary	1,382	0	0	0.0	1163	84.2	1163	84.2	300	269
WMKK	Tolerant Hardwood Hills	2,227	1	8	0.4	0	0.0	8	0.4	19	0
	Element Summary	2,227	1	8	0.4	0	0.0	8	0.4	19	0
WCMD	Tolerant Mixedwood Drumlins	7,396	2	331	4.5	1,547	20.9	1,878	25.4	3577	1029
WFDM	Tolerant Mixedwood Drumlins	1,054	0	0	0.0	35	3.3	35	3.3	10	0
WMDM	Tolerant Mixedwood Drumlins	5,134	1	0	0.0	1,296	25.2	1,296	25.2	2251	317
	Element Summary	13,584	3	331	2.4	2878	21.2	3209	23.6	5838	1346
IMDM	Tolerant Mixedwood Hummocks	593	0	0	0.0	0	0.0	0	0.0	0	0
WCRD	Tolerant Mixedwood Hummocks	1,931	0	487	25.2	447	23.1	934	48.4	240	240
WCSM	Tolerant Mixedwood Hummocks	681	0	0	0.0	0	0.0	0	0.0	0	0
	Element Summary	3205	1	487	15.2	447	13.9	934	29.1	240	240
WTLD	Wetlands	15,341	4	3,123	20.4	1,501	9.8	4,624	30.1	2313	274
720 Total Land Area		420,887	100	59,186	14.1	46,411	11.0	105,597	25.1	83965	13480

LaHave Drumlins Ecodistrict 740: Representation of Ecosystems and Elements											
Land Classification Unit		Ecodistrict Area		Reserve Area in Ecodistrict						Medway	
Ecosystem	Element	Ha	% of Ecodistrict	Legal Reserve		Policy Reserve		Total Reserve		Total Area	Reserve Area
				Ha	%	Ha	%	Ha	%	Ha	Ha
WMRD	Pine - Oak Hills and Hummocks	3,252	1	0	0.0	567	17.4	567	17.4	0	0
	Element Summary	3,252	1	0	0.0	567	17.4	567	17.4	0	0
IMHO	Spruce Hemlock Pine Hummocks and Hills	23,232	9	5,282	22.7	827	3.6	6,109	26.3	776	86
IMRD	Spruce Hemlock Pine Hummocks and Hills	5,535	2	1,056	19.1	1,488	26.9	2,544	46.0	0	0
PFHO	Spruce Hemlock Pine Hummocks and Hills	126	0	0	0.0	0	0.0	0	0.0	0	0
WCHO	Spruce Hemlock Pine Hummocks and Hills	1,767	1	0	0.0	0	0.0	0	0.0	0	0
WFHO	Spruce Hemlock Pine Hummocks and Hills	18,268	7	0	0.0	0	0.0	0	0.0	0	0
WMHO	Spruce Hemlock Pine Hummocks and Hills	23,139	9	1,665	7.2	165	0.7	1,830	7.9	79	0
	Element Summary	72,067	29	8,003	11.1	2,480	3.4	10,483	14.5	856	86
ICRD	Spruce Pine Flats	1,352	1	0	0.0	2	0.1	2	0.1	0	0
ICSM	Spruce Pine Flats	1,824	1	33	1.8	0	0.0	33	1.8	0	0
IFHO	Spruce Pine Flats	3,117	1	0	0.0	0	0.0	0	0.0	0	0
IFSM	Spruce Pine Flats	1,724	1	0	0.0	0	0.0	0	0.0	0	0
IMSM	Spruce Pine Flats	31,850	13	1,761	5.5	980	3.1	2,741	8.6	152	5
	Element Summary	39,867	16	1,794	4.5	982	2.5	2,776	7.0	152	5
IMDM	Tolerant Mixedwood Drumlins	15,735	6	0	0.0	37	0.2	37	0.2	27	0
WFDM	Tolerant Mixedwood Drumlins	34,294	14	107	0.3	107	0.3	214	0.6	117	0
WMDM	Tolerant Mixedwood Drumlins	70,722	29	3,094	4.4	746	1.1	3,840	5.4	516	57
WMKK	Tolerant Mixedwood Drumlins	5,160	2	0	0.0	0	0.0	0	0.0	0	0
	Element Summary	125,911	51	3201	2.5	890	0.7	4091	3.2	660	57
WTLD	Wetlands	6,280	3	421	6.7	476	7.6	897	14.3	73	0
740 Total		247,377	100	13,419	5.4	5,395	2.2	18,814	7.6	1,741	148

Annapolis Valley 610: Representation of Ecosections and Elements											
Land Classification Unit		Ecodistrict Area		Reserve Area in Ecodistrict						Medway	
Ecosection	Element	Ha	% of Ecodistrict	Legal Reserve		Policy Reserve		Total Reserve		Total Area	Reserve Area
				Ha	%	Ha	%	Ha	%	Ha	Ha
IMSM	Floodplain	3,200	4	15	0.5	0	0.0	15	0.5	0	0
	Element Summary	3,200	4	15	0.5	0	0.0	15	0.5	0	0
DKLD	Marshes and Grasslands	6,180	7	275	4.4	0	0.0	275	4.4	0	0
	Element Summary	6,180	7	275	4.4	0	0.0	275	4.4	0	0
ICSM	Pine - Oak Flats	12,306	14	26	0.2	0	0.0	26	0.2	3	0
WCSM	Pine - Oak Flats	9,527	10	1	0.0	0	0.0	1	0.0	0	0
	Element Summary	21,833	24	27	0.1	0	0.0	27	0.1	3	0
ICHO	Pine - Oak Hills and Hummocks	1,305	1	0	0.0	0	0.0	0	0.0	0	0
WCHO	Pine - Oak Hills and Hummocks	11,088	12	59	0.5	0	0.0	59	0.5	12	0
	Element Summary	12,393	14	59	0.5	0	0.0	59	0.5	12	0
IFHO	Red and Black Spruce Hummocks	5,348	6	9	0.2	0	0.0	9	0.2	0	0
IMHO	Red and Black Spruce Hummocks	6,532	7	5	0.1	0	0.0	5	0.1	0	0
	Element Summary	11,880	13	14	0.1	0	0.0	14	0.1	0	0
WFHO	Spruce Hemlock Pine Hummocks and Hills	5,515	6	11	0.2	0	0.0	11	0.2	0	0
WMHO	Spruce Hemlock Pine Hummocks and Hills	16,589	18	25	0.2	1	0.0	26	0.2	106	0
WMKK	Spruce Hemlock Pine Hummocks and Hills	1,101	1	0	0.0	0	0.0	0	0.0	0	0
WMMS	Spruce Hemlock Pine Hummocks and Hills	6,262	7	10	0.2	0	0.0	10	0.2	0	0
	Element Summary	29,467	32	46	0.2	1	0.0	47	0.2	106	0
IFSM	Spruce Pine Flats	3,868	4	0	0.0	0	0.0	0	0.0	0	0
	Element Summary	3,868	4	0	0.0	0	0.0	0	0.0	0	0
WFSM	Tolerant Hardwood Hills	469	1	0	0.0	0	0.0	0	0.0	0	0
	Element Summary	469	1	0	0.0	0	0.0	0	0.0	0	0
WTLD	Wetlands	847	1	0	0.0	0	0.0	0	0.0	0	0
XXMS	Salt Marshes	974	1	52	5.3	0	0.0	52	5.3	0	0
610 Total		91,111	100	488	0.5	1	0.0	489	0.5	121	0