

**HIGH CONSERVATION VALUE FOREST
ASSESSMENT REPORT
FOR THE MEDWAY DISTRICT**

**Bowater Mersey Paper Company Limited
February 5, 2010**

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SUMMARY OF HIGH CONSERVATION VALUES IDENTIFIED IN MEDWAY DISTRICT

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"> ▪ Implementation of landscape ecological management zoning (LEMZ) resulting in 1773 ha old growth (no harvest) and 7817 ha low impact (partial harvest) zones.
Large diameter snags	Chimney Swift	<ul style="list-style-type: none"> ▪ Protection of large trees through: <ul style="list-style-type: none"> ○ LEMZ ○ Legacy snag/cavity tree retention during harvesting ○ Decreasing mosaic harvesting, thereby increasing percentage of partial harvests ○ 20- to 30-m special management (no harvest) zones adjacent watercourses $\geq 50\text{cm}$ wide
Open forest / Regenerating cutovers	Common Nighthawk	<ul style="list-style-type: none"> ▪ 100-year wildlife habitat objective ▪ Mosaic, variable retention, and seed tree silvicultural prescriptions
Treed fens, lakeshore wetlands, seasonally flooded flats, rivers and streams	Rusty Blackbird	<ul style="list-style-type: none"> ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses $\geq 50\text{ cm}$ 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 ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses $\geq 50\text{ cm}$ wide and water bodies ▪ Respect NSE stream crossing permit
Round Hill River and tributaries $\geq 50\text{cm}$ in width	Atlantic Salmon	<ul style="list-style-type: none"> ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses $\geq 50\text{ cm}$ 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"> ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses $\geq 50\text{ cm}$ wide ▪ Continue to support surveys by experts
Balsam fir stands within 50m of a wetland and 25 km of the Bay of Fundy	Boreal Felt Lichen	<ul style="list-style-type: none"> ▪ Site inspection where proposed operations overlap with sites not previously surveyed for boreal felt lichen ▪ Consider recovery team recommendations ▪ Continue to support surveys by experts
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	Brook Trout	<ul style="list-style-type: none"> ▪ Leave 20- to 30-m special management (no harvest) zones adjacent Sandy Bottom,

Branch Liverpool Rivers		<p>Boot, Gull and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers</p> <ul style="list-style-type: none"> ▪ 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 ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses \geq 50 cm wide ▪ LEMZ (no harvest old growth zone) and recruitment of old growth forest if found ▪ Continue to support surveys by experts ▪ Restricting maximum opening size to 80ha ▪ 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 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
<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"> • Implementation of LEMZ resulting in 1773 ha old growth (no harvest) and 7817 ha low impact (partial harvest) zones
<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 ▪ Leave 20- to 30-m special management (no harvest) zones adjacent watercourses \geq 50 cm wide and water bodies ▪ No harvesting in treed fen or hardwood swamp wetlands ▪ No operations in wetlands identified by the NS DNR wetland database or other known wetlands

LEMZ old growth and low impact zones; stands where climax species comprise ≥ 30 percent of the forest stand and are greater than 120 years old; bathing holes used by bears in the Morehouse Lake area	Declining ecosystems	<ul style="list-style-type: none"> Implementation of LEMZ resulting in 1773 ha old growth (no harvest) and 7817 ha low impact (partial harvest) zones and recruitment of old growth forest if found Increase multi-aged stands with late seral species through increase in partial harvesting prescriptions Survey for bear bathing hole and create special management zone if found
WCDM and WFKK ecosections and lands identified through the Colin Stewart Forest Forum	Ecosystems not protected	<ul style="list-style-type: none"> Implementation of LEMZ resulting in 1773 ha old growth (no harvest) and 7817 ha low impact (partial harvest) zones Investigate uniqueness of WFKK ecosection Operating moratorium until December 2010 on most lands identified by the Colin Stewart Forest Forum
Unique Areas and wetlands	Unique forest ecosystems	<ul style="list-style-type: none"> No operations within Unique Areas, bogs, marshes, fens, and meadows Leave 20- to 30-m 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"> Leave 20- to 30-m 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"> Leave 20- to 30-m special management (no harvest) zones adjacent wetlands with the exception of shrub bogs, shrub swamps, and treed bogs Leave 20- to 30-m 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"> ▪ Leave 20- to 30-m 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

Preamble

In 2008 Bowater Mersey Paper Company Limited Mersey Woodlands Operations decided to undertake Forest Stewardship Council (FSC) Forest Management Certification in the Medway District due to customer demand for FSC-certified paper. KBM Forestry Consultants were contracted to complete the High Conservation Value Forest (HCVF) Assessment Report for Medway District. This Report was completed prior to Mersey's FSC registration audit, circulated for comment, and responded to. Mersey has received written comments on the KBM HCVF Assessment Report from Annapolis Field Naturalists, Canadian Parks and Wilderness Society (CPAWS), Ecology Action Centre (EAC), Mersey Tobeatic Research Institute (MTRI), and representatives at the Nova Scotia Department of Natural Resources (NS DNR).

These comments are incorporated into this second version of Mersey's HCVF Assessment Report. This version will also include the specific measures suggested to ensure maintenance or enhancement of the conservation value(s) identified for each high conservation value (HCV).

This version builds on the KBM report foundation and directly addresses comments from interested parties throughout.

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 values can be defined as a HCVF. Identifying these areas is the first step; developing appropriate management strategies to ensure the identified 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 individual 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 Kejimikujik Park and west of the Cloud Lake Wilderness Area. The location of this area in the province is illustrated in Figure 1 (KBM 2009). Medway is comprised of approximately 98,000 ha of coniferous, mixedwood, and deciduous forest. The coniferous climax species found in the District are red spruce, eastern hemlock, and white pine. The deciduous climax species found are sugar maple, yellow birch, and American beech. The majority of the Medway District lies within the South Mountain Ecodistrict (Neily *et al.* 2003) of the provincial ecological land classification, which is characterised by shallow, stony, and dry soils with large granite boulders throughout. Maximum elevation is 250 m above sea level. The Medway District spans three watersheds, which include the Medway and Mersey flowing to the south and Round Hill to the north.

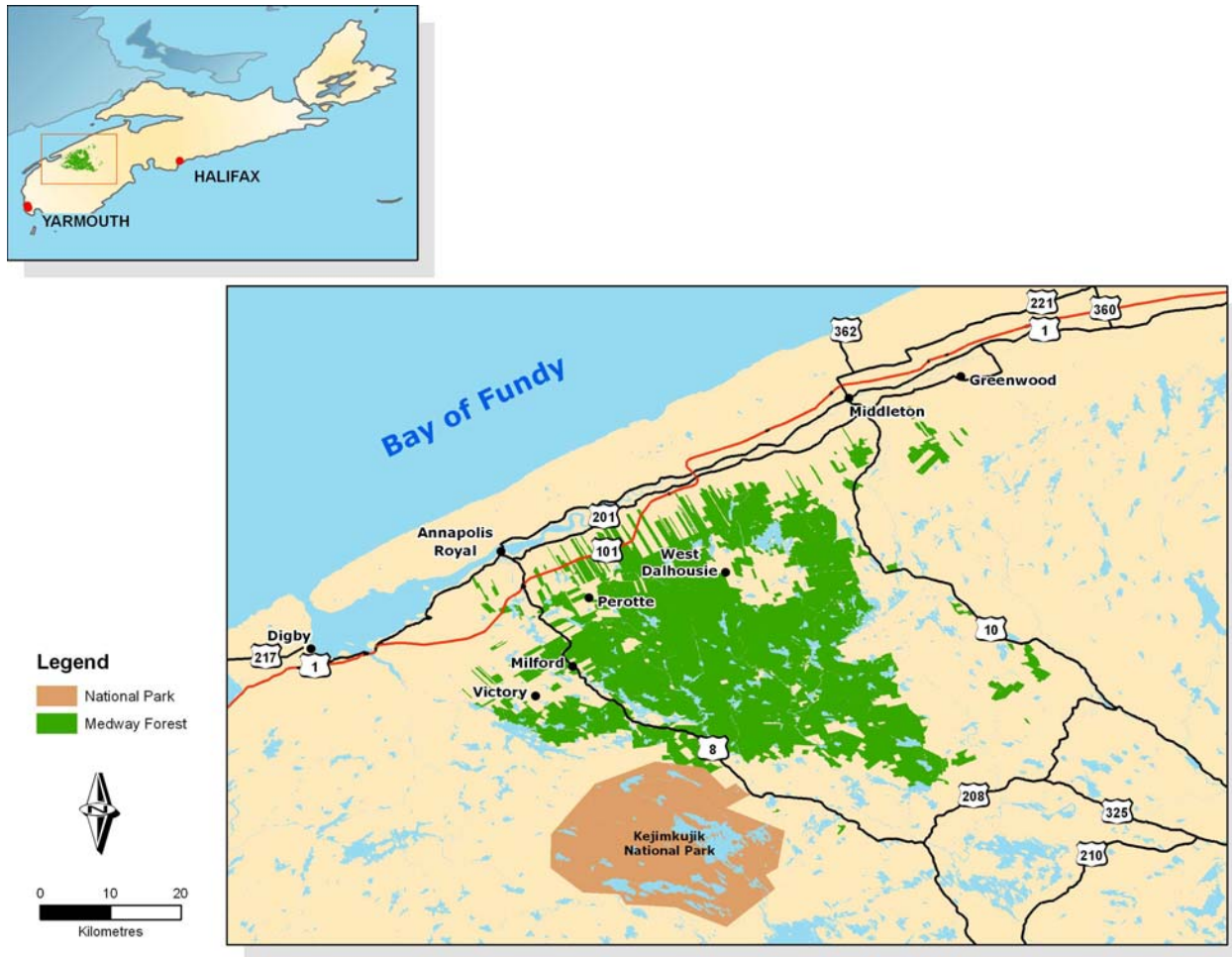


Figure 1. Overview map of the Medway forest lands of Bowater Mersey Paper Company Limited in Nova Scotia

The province of 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-CAN-Maritimes-2008). The identification of HCVs is a dynamic process where new information is continually being integrated into the assessment process. The picture of Medway today will continue to change and revisions of this document will need to occur on a periodic basis.

To immediately help the reader better understand the use of terminology with respect to wetlands, a breakdown of the various wetland types is provided in Table 7. This list of wetlands highlights specific wetland types known to occur on Company lands that were identified through aerial photographic interpretation. Use of only the term wetlands may refer to all or any of the features listed, but a specific type(s) of wetland is highlighted often throughout the document in High Conservation Values designated for particular species.

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?

Table 1 illustrates species found in Nova Scotia listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and species listed under the federal Species At Risk Act (SARA).¹

Table 1
COSEWIC AND FEDERALLY LISTED SPECIES FOUND IN NOVA SCOTIA

Common Name	Taxon	COSEWIC Status	SARA Status
Atlantic Walrus	Mammals	Special Concern	-
Gaspé Shrew	Mammals	-	Special Concern
Eskimo Curlew	Birds	Endangered	Endangered
Piping Plover	Birds	Endangered	Endangered
Roseate Tern	Birds	Endangered	Endangered
Red Knot	Birds	Endangered	-
Chimney Swift	Birds	Threatened	Threatened
Least Bittern	Birds	Threatened	Threatened
Peregrine Falcon	Birds	-	Threatened
Canada Warbler	Birds	Threatened	-
Common Nighthawk	Birds	Threatened	-
Olive-sided Flycatcher	Birds	Threatened	-
Whip-poor-will	Birds	Threatened	-
Barrow's Goldeneye	Birds	Special Concern	Special Concern
Bicknell's Thrush	Birds	Special Concern	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
Horned Grebe	Birds	Special Concern	-
Monarch	Arthropods	Special Concern	Special Concern
Blanding's Turtle	Reptiles	Endangered	Endangered
Eastern Ribbonsnake	Reptiles	Threatened	Threatened
Wood Turtle	Reptiles	Threatened	Special Concern
Snapping Turtle	Reptiles	Special Concern	-
Yellow Lampmussel	Molluscs	Special Concern	Special Concern
Brook Floater	Molluscs	Special Concern	-
Atlantic Salmon	Fishes	Endangered	Endangered

¹ Government of Canada Species at Risk Public Registry at http://www.sararegistry.gc.ca/default_e.cfm

Common Name	Taxon	COSEWIC Status	SARA Status
Atlantic Whitefish	Fishes	Endangered	Endangered
Striped Bass	Fishes	Threatened	-
American Eel	Fishes	Special Concern	-
Eastern MountainAvens	Vascular Plants	Endangered	Endangered
Thread-leaved Sundew	Vascular Plants	Endangered	Endangered
Golden Crest	Vascular Plants	Threatened	Threatened
Tuberclad Spike-rush	Vascular Plants	Threatened	Threatened
Water-pennywort	Vascular Plants	Threatened	Threatened
Eastern Lilaeopsis	Vascular Plants	Special Concern	Special Concern
Redroot	Vascular Plants	Special Concern	Threatened
Long's Bulrush	Vascular Plants	Special Concern	Special Concern
New Jersey Rush	Vascular Plants	Special Concern	Special Concern
Sweet Pepperbush	Vascular Plants	Special Concern	Special Concern
Boreal Felt Lichen	Lichens	Endangered	Endangered
Frosted Glass-whiskers	Lichens	Special Concern	Special Concern
Ghost Antler	Lichens	Special Concern	-

The following table illustrates all listed species in Nova Scotia as designated under the provincial Endangered Species Act (ESA) (ACPF = Atlantic Coastal Plains Flora).²

Table 2
ALL LISTED SPECIES IN NOVA SCOTIA AS DESIGNATED BY THE PROVINCIAL
ENDANGERED SPECIES ACT (ESA) (ACPF = ATLANTIC COASTAL PLAINS FLORA)

Common Name	Taxon	NS ESA listing
American Marten (Cape Breton Population)	Mammals	Endangered
Canada Lynx	Mammals	Endangered
Moose	Mammals	Endangered
Chimney Swift	Birds	Endangered
Harlequin Duck	Birds	Endangered
Piping Plover	Birds	Endangered
Red Knot	Birds	Endangered
Roseate Tern	Birds	Endangered
Common Nighthawk	Birds	Threatened
Peregrine Falcon	Birds	Threatened
Bicknell's Thrush	Birds	Vulnerable
Blanding's Turtle	Reptiles	Endangered
Eastern Ribbonsnake	Reptiles	Threatened
Wood Turtle	Reptiles	Vulnerable
Yellow Lamp Mussel	Molluscs	Threatened
Atlantic Whitefish	Fishes	Endangered
Eastern Mountain Avens	Vascular Plants	Endangered
Pink Coreopsis (ACPF)	Vascular Plants	Endangered

² Government of Nova Scotia Species at Risk List at <http://www.gov.ns.ca/natr/wildlife/biodiversity/species-list.asp>

Common Name	Taxon	NS ESA listing
Plymouth Gentian (ACPF)	Vascular Plants	Endangered
Ram's-Head Lady Slipper	Vascular Plants	Endangered
Rockrose (Canada Frostweed)	Vascular Plants	Endangered
Thread-leaved Sundew (ACPF)	Vascular Plants	Endangered
Water-Pennywort (ACPF)	Vascular Plants	Endangered
Golden-crest (ACPF)	Vascular Plants	Threatened
Redroot (ACPF)	Vascular Plants	Threatened
Tubercled Spikerush (ACPF)	Vascular Plants	Threatened
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
Boreal Felt Lichen	Lichens	Endangered

Through consultation with Dr. Donna Hurlburt, Dr. Graham Forbes, the EAC, and the MTRI, the above lists were distilled to the following suite of species that are known from or have a high probability of being found in the Medway District:

- American Marten
- Moose
- Chimney Swift
- Peregrine Falcon
- Common Nighthawk
- Rusty Blackbird
- Monarch
- Blanding's Turtle
- Eastern Ribbonsnake
- Wood Turtle
- Atlantic Salmon
- Eastern White Cedar
- Rockrose
- Prototype Quillwort
- Water-pennywort (ACPF)
- Redroot (ACPF)
- Long's Bulrush (ACPF)
- Sweet Pepperbush (ACPF)
- Boreal Felt Lichen

The number of species at risk and species of special concern continues to grow. As part of each management strategy detailed below for the above list of species, the Company will annually contact NS DNR and MTRI to determine if a meeting is warranted and regularly:

- 1) Meet with the NS DNR Wildlife Division to discuss the status of listed species and those of special concern (red and yellow status).
- 2) Meet with the MTRI to learn of any new discoveries of species at risk and update Company records of listed species and those of special concern.
- 3) Cooperate with Species at Risk Recovery Team efforts to protect species at risk and regularly review recovery plans to incorporate into management strategies.
- 4) Continue to support Breeding Bird Atlas surveys on Company land and facilitate access to remote survey squares.
- 5) Support research efforts on species at risk in southwestern Nova Scotia.
- 6) Update Atlantic Canada Conservation Data Centre (ACCDC) and NS DNR Significant Habitat data on species at risk and species of special concern.
- 7) Utilise expert botanists and biologists to survey for listed species and species of special concern.

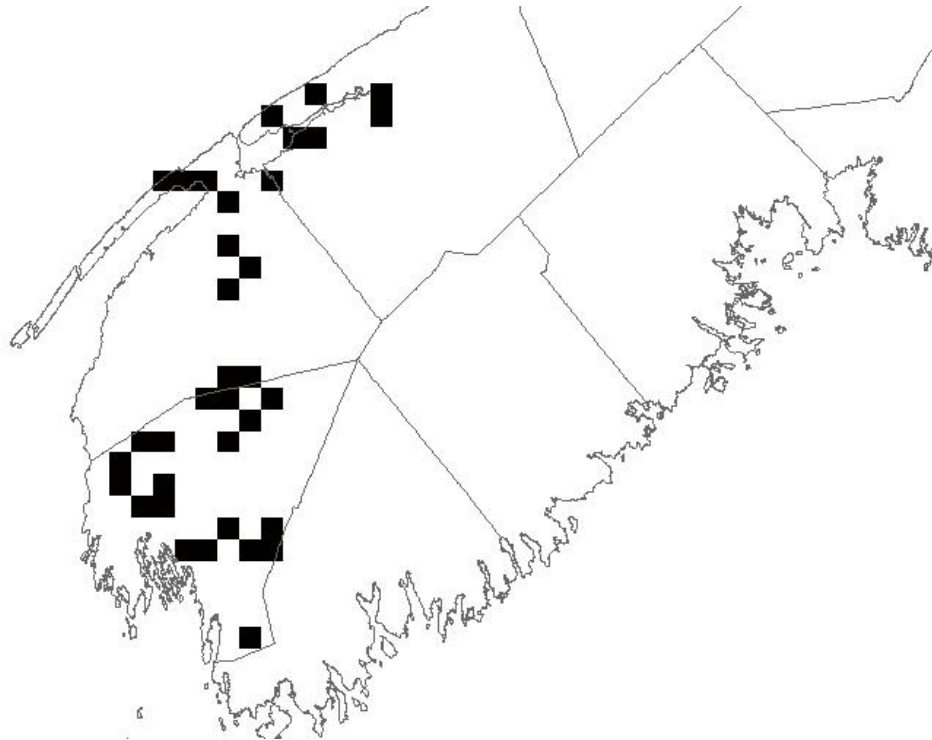
American Marten (Provincially – Endangered [Cape Breton population])

Forest Requirements

American marten (*Martes americana*) have been historically found in late-successional conifer forest that provides cover and escape routes from predators, presence of coarse, woody debris for denning, and prey abundance that consists largely of small mammals, most importantly voles (Nova Scotia American Marten Recovery Team 2006). The species is, however, being found more commonly in younger conifer-dominated stands. Home range is large (as much as 5 km²) and the preference for interior forest areas is well documented.

Distribution

While only the Cape Breton population is listed in Nova Scotia, 116 individuals were re-introduced to Kejimikujik National Park adjacent the Medway District in the period 1987–1994 (Nova Scotia American Marten Recovery Team 2006). The re-introduction would suggest that marten may exist in the Medway District where late-successional conifer-dominated forest exists and is supported by NS DNR [NS DNR] (2009a) evidence of 2008 marten locations in Annapolis County (Figure 2).



**Figure 2. American marten locations in southwest Nova Scotia in 2008
(NS DNR 2009a)**

While only sighting or trapping records (not evidence of breeding or denning) in these 5 km x 5 km grids, these records provide evidence that marten may exist in the Medway District. The ACCDC reports only three records from Annapolis County, two of which coincide with locations in Figure 2. The outlier is located 3 kms west northwest of Pretty Mary Lake adjacent the Medway District (ACCDC 2009). All three of these records are within 500 m of the Medway District.

High Conservation Value Identified

While not listed in mainland Nova Scotia, the presence of marten is rare and precautionary measures to ensure forest structure exists for the species will be adopted in the Medway District. The Medway Management Plan details wildlife habitat objectives for marten over the next 100 years.

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

Management Strategy

Mersey Woodlands has adopted a landscape ecological management zoning (LEMZ) approach to guide the intensity of forest interventions in Medway. This approach assigns land to old growth, low intensity, extensive, or intensive management zones, depending on the management objective. LEMZ is designed to facilitate connectivity between the Tobeatic Wilderness Area and Kejimikujik National Park to the southwest of Medway and the McGill and Cloud Lake Wilderness Areas to the northeast (Figure 3). As a result of this zoning, 1773 ha of land in Medway is assigned to the old growth forest zone (no planned intervention) and 7817 ha to the low impact zone where a partial harvest prescription will result in continuous forest cover while minimizing fragmentation and opening size.

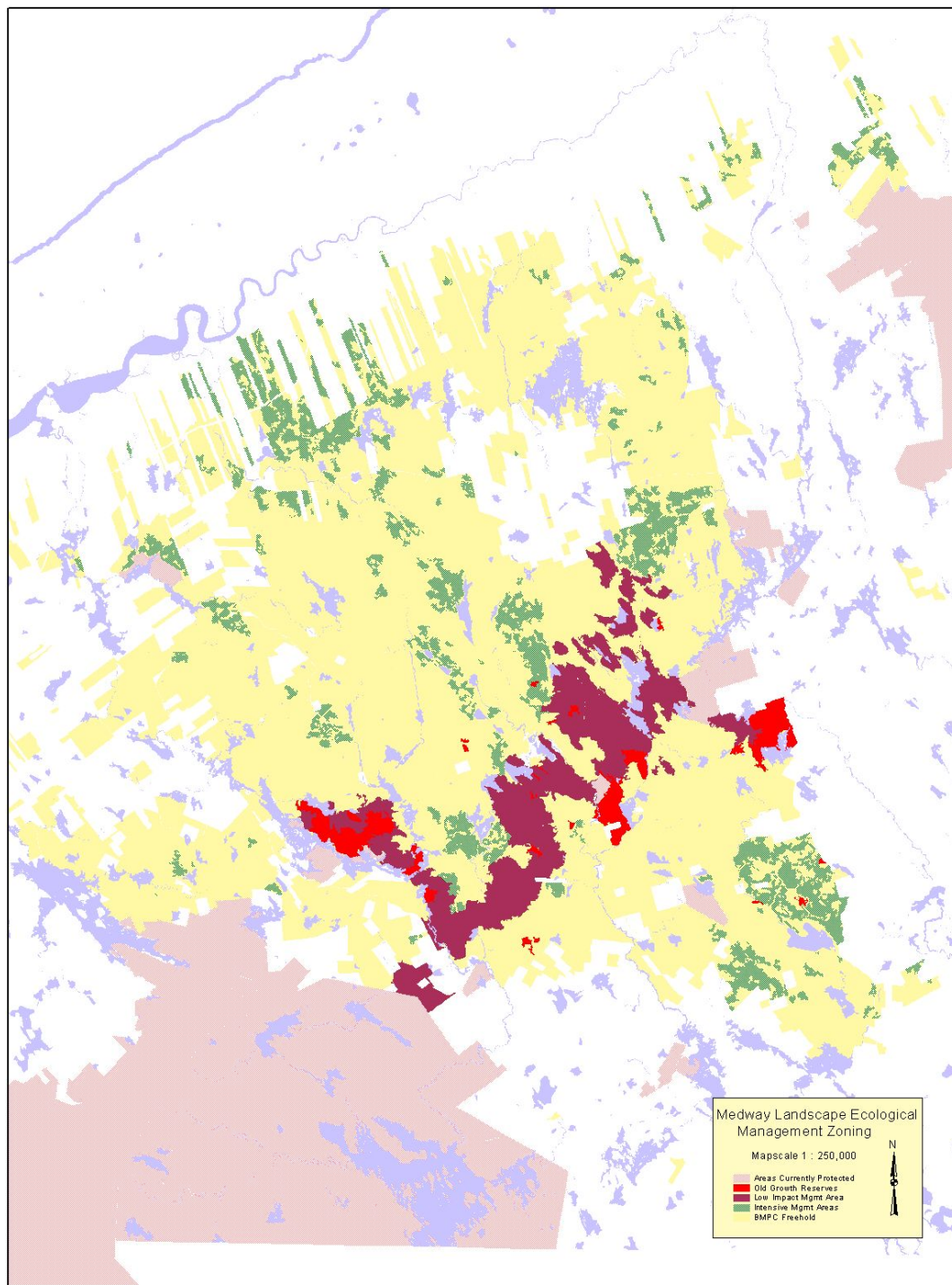


Figure 3. The Landscape Ecological Management Zoning approach to forest management in the Medway District
Note the corridor resulting from the assignment of old growth and low intensity zones

Old growth forest confirmed by staff in the future will be assigned to the old growth management zone and designated HCV for marten.

Mersey Woodlands will continue to work with the NS DNR to learn of marten locations in Medway and modify the assignment of HCVF for marten where necessary.

Eastern Moose – Mainland Population (Provincially – Endangered)

Forest Requirements

Moose use most stages of forest development throughout their life (NS DNR 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 use a variety of mature conifer and mixedwood forest for shelter and protection from winter weather conditions and predators.

Distribution

Moose were thought to be 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 now a small (150) population is thought to exist in southwest Nova Scotia (Tobeatic Wilderness Area). In the last ten years the NS DNR has recorded four observations of moose in the Medway District (Figure 4). Company staff claim that moose once existed in Medway, but no internal records exist for the last ten years.

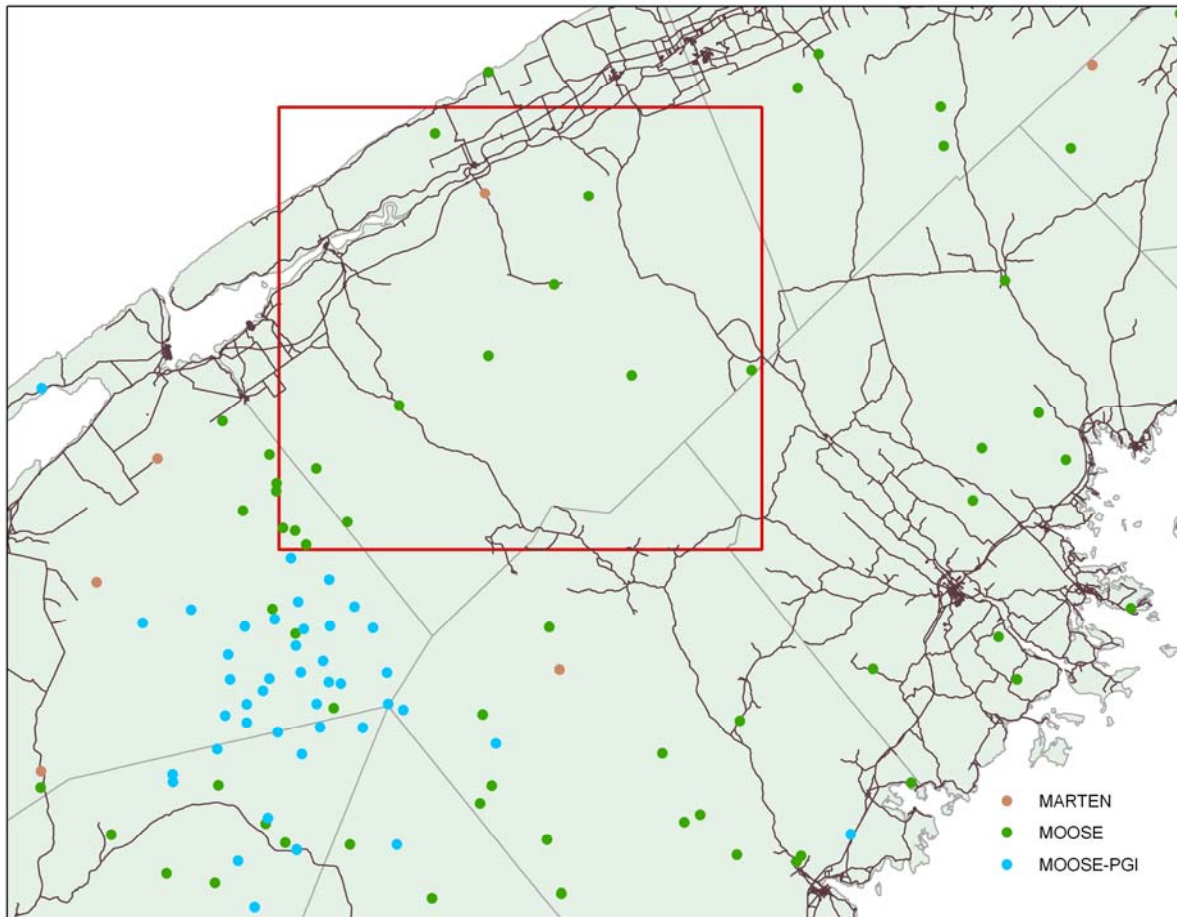


Figure 4. Survey results for Mainland moose 2000–2009 (NS DNR 2009b) in Annapolis County (contained within red square); these include 25 pellet transects surveyed annually, when possible, in Annapolis County

High Conservation Value Identified

Designation of a single or multiple structural elements as HCV for moose is difficult because of their use of a broad array of forest types and structure and no one structural element has emerged as requisite for moose in Medway. Designation of the entire Medway area as an HCVF for Mainland moose is awkward and marginalizes the intent of the HCVF concept. Hence, no HCVF for Mainland moose is designated in Medway; however, a variety of measures to assist the recovery of the species have been implemented.

Management Strategy

As an active participant in the Mainland Moose Recovery Team, the Company will implement any recovery actions that necessitate modifications in forest operations. Specifically, the recovery action “review and adapt forest management practices as habitat requirements of moose in Nova Scotia are better understood” will be addressed during team meeting discussions (NS DNR 2007). All staff and contractors have received species at risk training and report any sightings of moose to Company staff, which are in turn reported to the NS DNR.

A significant portion of the Medway District is gated, so vehicular access by the public is restricted. Wherever possible, dead end roads are planned instead of loop roads to further limit access to remote areas within the District. Unfortunately, unauthorized off-highway vehicle (OHV) access is impossible to restrict. However, signs indicating the prohibition of unauthorized OHVs on Company land have been erected throughout the Medway District and the NS DNR patrols Company land.

The implementation of LEMZ will ensure that at least 10 percent of Medway remains in old growth forest cover or continuous cover through partial harvesting for moose thermoregulation. Again, LEMZ was spatially designed to facilitate movement of animals such as moose from large protected areas west of Medway to large protected areas east of Medway. In addition, any stream greater than 50 cm in width will be assigned a special management zone (SMZ) providing a corridor for moose travel adjacent an area regenerating fresh browse available for moose. Increasing structural retention through partial harvesting (at least 50 percent of harvest areas annually) will also increase cover for moose in Medway.

Chimney Swift (Federally – Threatened; Provincially – Endangered)

Forest Requirements

The chimney swift (CHSW) historically nested in large hollow trees, tree cavities, or caves; however, Erskine (1992) suggests that large hollow trees that were likely more common in pre-European settlement times were also unlikely to have supported large numbers of CHSW. Reports of CHSW gathering in great numbers in residential areas in the early 1900s suggest that houses with large chimneys aided CHSW population numbers (Erskine 1992). Houses with large chimneys have now been suggested as the preferable nesting structure for CHSW; but in sparsely populated areas, CHSW may still nest in trees or caves (Cink and Collin 2002). Insects are taken while in flight over mostly open ground and above ponds, lakes, and housing developments.

Distribution

CHSW were widely reported from Nova Scotia in the late 1980s. However, it was thought that the species was in decline with the use of aerial spraying of insecticide for spruce budworm, the removal of large urban chimneys with the shift from coal to electric or oil heating, and the projected decrease in large trees in forested areas (Erskine 1992). Researchers recorded CHSW at five locations during bird surveys along the east and west branches of the Medway River in Medway during 1997-1998, but none were noted in subsequent survey efforts (Lavers and Staicer 2009). Breeding Bird Atlas surveyors have recorded CHSW in Medway since 2005 (Maritimes Breeding Bird Atlas 2008).

High Conservation Value Identified

Large snags that provide nesting opportunities in either hollow spaces or cavities are considered HCV for chimney swift. No caves are currently known from Medway, but such features will be evaluated for HCV if they are discovered.

Management Strategy

Protection of large trees in Medway will be accomplished through the following practices:

- Implementation of LEMZ within Medway and the protection of all trees within the old growth zone and remaining large trees within the low impact zone of partial harvesting (maintenance of continuous canopy cover).
- Retention of individual snag/cavity trees in mosaic harvests with a preference for poplar, birch, and maple and secondarily pine, hemlock, and spruce trees.
- Overall reduction of mosaic harvest and the resulting increase of partial harvest and greater canopy retention.
- Conformance with provincial regulations that require wildlife clump retention and encouraging contractors to locate wildlife clumps around snag trees.
- No harvesting within 20- to 30-m SMZs on either side of watercourses ≥ 50 cm enabling trees within that 40- to 60-m (total width) zone to develop naturally (grow older and bigger without any human disturbance). SMZs in mosaic, seed tree, and variable retention harvests constitute 30-m no harvest zones adjacent to a defined watercourse channel ≥ 50 cm or body of water. SMZs in selection and shelterwood harvests and in commercial thinnings are 20-m no harvest zones adjacent to watercourses ≥ 50 cm with the rationale that more trees are retained in these prescriptions, so the need for buffering the watercourse is reduced.

Peregrine Falcon (Federally – Threatened; Provincially – Threatened)

Forest Requirements

Peregrine falcon is associated with high cliffs (nesting sites) and forages predominantly in large open spaces on birds in flight. The bird will 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 in the 1960s (Erskine 1992). They were reintroduced in 1982 and now cliffs along the Bay of Fundy support nine known nesting pairs (MTRI 2008). A pair of Peregrine falcons were observed in flight in the northeast portion of Medway southeast of Carter Lake in 2007.³

High Conservation Value Identified

The critical landscape structural element for Peregrine falcons is high cliffs on which the bird will nest. Medway does not contain any known high cliffs and therefore no HCV is declared for Peregrine falcon.

Management Strategy

No management strategy is necessary for Peregrine falcon at this time since Medway contains no structural elements required by the species.

³ Atlantic Canada Conservation Data Centre 2010 data.

Common Nighthawk (Provincially – Threatened)

Forest Requirements

Nest sites of nighthawk are found on logged or slashburned forest sites and natural open clearings (Poulin *et al.* 1996). Stands in Medway likely support nesting nighthawk until the lower branches of saplings begin to touch (20-25 years) and close off flight access to the forest floor. Birds feed in flight on insects over water and forest canopy.

Distribution

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

High Conservation Value Identified

Open forest and regenerating cutovers up to 20 years old are designated as HCV for Common nighthawk nesting requirements. 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 for Medway. These include no decline in habitat of high value for Common nighthawk over the next 100 years. Thus, the forest modelling process (Woodstock) 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.

Surveyors for the Maritime Breeding Bird Atlas will continue to be granted access to Medway to survey for breeding birds and these data will annually be incorporated into the HC VF management strategy and overall management planning.

Harvest prescriptions in Medway commonly result in partial harvests and the retention of snag/cavity trees is required in mosaic harvests. While this structure is not favourable for nesting nighthawks, continuing to create openings (mosaic harvests) should support nighthawk nesting areas.

All contractors and staff have received species at risk training and report sightings of Common nighthawk to Company supervisors. Awareness of Common nighthawk for precommercial thinning workers is critical as this activity is most likely to disturb nesting nighthawks in Medway.

Rusty Blackbird (Federally – Special Concern)

Forest Requirements

The Rusty blackbird is found in wet coniferous or mixedwood forests that have cool spruce bogs, swamps, and alder swales. They may 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. Blackbirds 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 water's edge of ponds or open bogs, logs in water, or from wading directly in water. Rusty blackbirds will infrequently attack and kill other small birds for food (Erskine 1992, Avery 1995).

Distribution

Difficult to survey because of the forest structure they frequent, Rusty blackbirds were still documented in all regions in Nova Scotia but were not common. Records from the 1980s suggest that Rusty blackbirds were found in Medway (Erskine 1992) and these are also reported by the ACCDC. Nesting Rusty blackbirds were also documented in 2005-2006 in Medway just north of Kejimikujik National Park (Ackerman 2007).

High Conservation Value Identified

Rusty blackbird requires trees and dense foliage to nest in that are located adjacent the edge of a wet area. Any wet, open area with vertical structure on the periphery is considered an HCV for Rusty blackbird. In Medway this includes treed fen, lakeshore wetland, seasonally flooded flats, rivers, and streams.

Management Strategy

A SMZ (20- to 30-m no harvest) will be applied to the edges of treed fens, lakeshore wetlands, seasonally flooded flats, rivers, and streams. All staff and contractors will receive annual refresher training on species at risk and any sightings will be reported to Company staff.

Monarch (Federally – Special Concern)

Forest Requirements

Monarch butterflies can be found wherever wildflowers thrive, including open fields, meadows, and roadsides. Milkweed is the preferred plant on which the species lays eggs and also feeds⁴ (MTRI 2008).

Distribution

Monarch can be found throughout Nova Scotia.

⁴ Species at Risk Public Registry at http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=294

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 by forest operations, so no HCV is required for Monarch.

Management Strategy

No specific strategy is implemented at this time.

Blanding's Turtle (Federally – Endangered; Provincially – Endangered)

Forest Requirements

An aquatic reptile, Blanding's turtles are found in shallow water of 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 are found in a variety of loose substrate on road edges, landings, or open fields up to 410 m from water.⁵

Distribution

Current research has determined that three metapopulations of Blanding's turtles exist in western Nova Scotia; they are loosely centred in Kejimikujik National Park, McGowan Lake, and the community of Pleasant River (Figure 5). Bowater Mersey Paper Company Limited, in response to the determination of the metapopulation at McGowan Lake, designated 104 ha of land adjacent 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 then sold to the Crown in 2007.

⁵ Government of Canada Species at Risk Public Registry at http://www.sararegistry.gc.ca/default_e.cfm

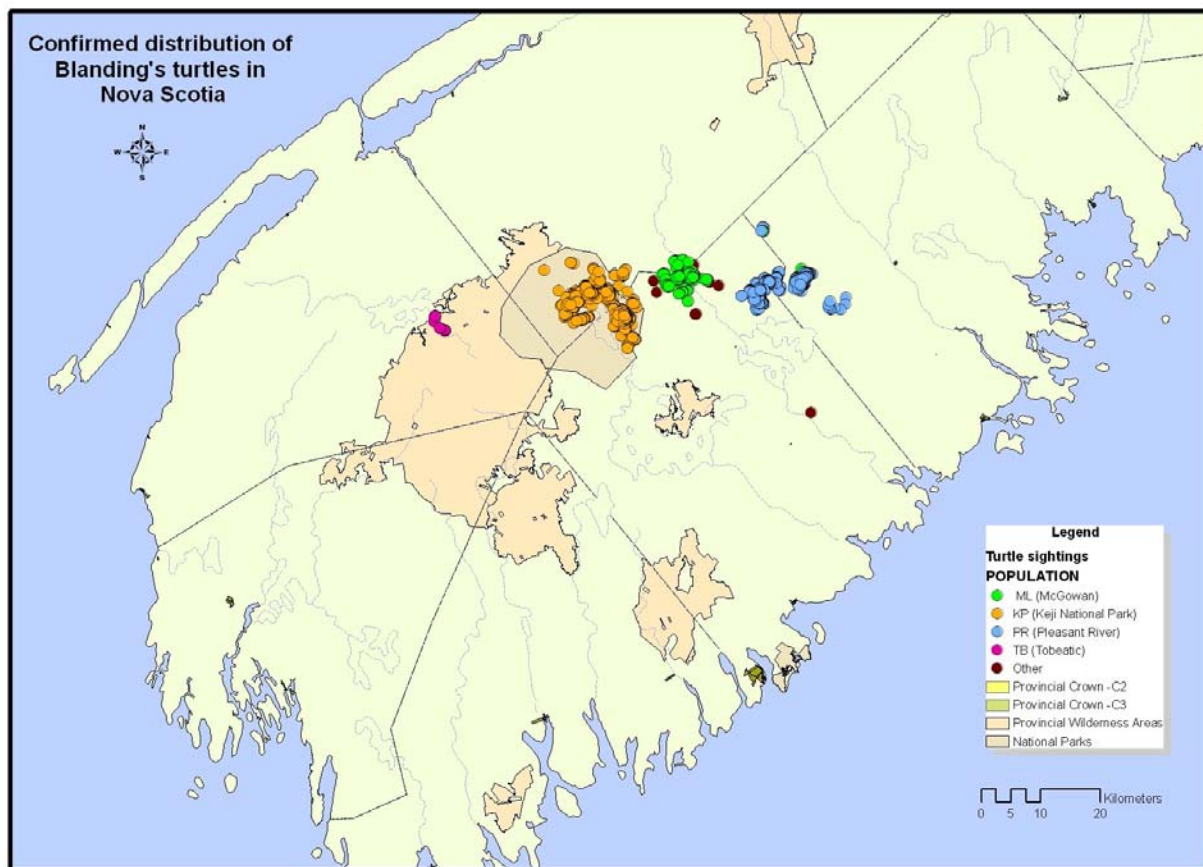


Figure 5. Blanding's turtle confirmed sightings in western Nova Scotia⁶

Blanding's turtles in the McGowan Lake system are located < 1 km from Company land on the southern edge of the District (McGowan Lake) 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 50-trap night effort on East Stoney Lake in the Medway River system within Medway District (Lavers and Staicer 2009).

High Conservation Value Identified

All lakes, ponds, marshes, and bogs are assigned HCV 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.

⁶ Nova Scotia Species at Risk Resource Site at <http://www.friendsofkeji.ns.ca/recovery/index.asp>

Management Strategy

Company staff continue to participate in Recovery Team planning for Blanding's turtles and management recommendations from the team will be implemented as they are developed. Company staff will work with the Recovery Team to identify operations that overlap with proposed critical habitat to focus survey efforts by researchers. Efforts to survey and continue research on Blanding's turtles will continue to be supported by the Company.

Harvesting adjacent to watercourses ≥ 50 cm will be buffered with a SMZ (20- to 30-m no harvest).

All harvesting adjacent bodies of water will be buffered with a SMZ (30-m no harvest).

Where road construction activities must cross a watercourse, all terms of the Company's approval permit from Nova Scotia Environment will be respected. All staff and contractors will receive annual refresher training on species at risk and any sightings will be reported to Company staff.

Eastern Ribbonsnake (Federally – Threatened; Provincially – Threatened)

Forest Requirements

Ribbonsnake 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 ribbonsnake in the province (Figure 6).

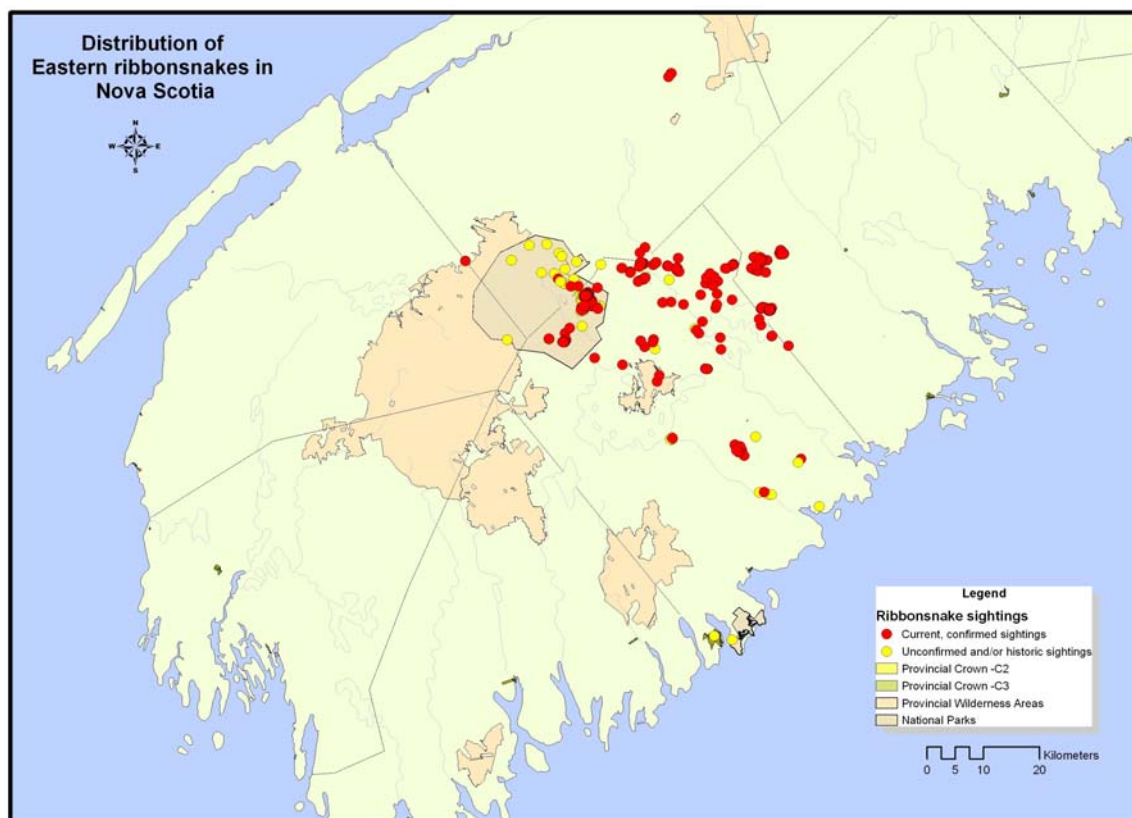


Figure 6. Locations of Eastern ribbonsnake in western Nova Scotia⁷

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

High Conservation Value Identified

As a result of the overlap in wetland structure preferred by Eastern ribbonsnake and Blanding's turtle, HCVs 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

The strategy for Eastern ribbonsnake is identical to that for Blanding's turtle. Of note, researchers were notified prior to spring 2009 of an overlap between two proposed harvest areas and critical habitat of ribbonsnakes. Survey efforts were focused on these areas and no ribbonsnakes have been observed to date. If ribbonsnakes are recorded in proposed operating areas, measures will be discussed with the Recovery Team to protect necessary structure and critical habitat for ribbonsnakes.

⁷ Nova Scotia Species at Risk Resource Site at <http://www.friendsofkeji.ns.ca/recovery/index.asp>

Wood Turtle (Federally – Special Concern; Provincially – Vulnerable)

Forest Requirements

Wood turtles are similar to Blanding's turtles in that they are semi-aquatic and are most often found in riparian areas and flood plains. Requisite structural elements include water (stream or river), a sandy substrate for nesting, and forest. Wood turtles in summer may use wet-mesic forested flood plains or riparian areas and tend to be found in dense undergrowth while feeding and open sites for basking. Rarely are they found more than 300 m from water (MacGregor and Elderkin 2003, COSEWIC 2007).

Distribution

Found throughout most of the province, Wood turtle range does not extend 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).

High Conservation Value Identified

Much survey effort for turtles and snakes in aquatic habitat has resulted in few records of Wood turtles in Medway. HCVs have already been designated for Blanding's turtle and ribbonsnake, species that use many of the same structural landscape features as Wood turtle. No HCV is therefore necessary for Wood turtle at this time. If greater numbers of this vulnerable species are discovered in future surveys for Wood turtles in Medway and surrounding area, the status of freshwater streams and rivers as HCVs for Wood turtles will be re-evaluated.

Management Strategy

No specific management strategy will be developed and implemented for Wood turtles in Medway; however, surveys for aquatic species at risk are on-going and will continue to be supported by the Company.

Atlantic Salmon (Inner Bay of Fundy populations) (Federally – Endangered)

Forest Requirements

Salmon do not require forest structure for survival as they live in the ocean as adults and freshwater rivers and streams as young. Forest management activities can impede migration of adult salmon seeking gravel/cobble substrate in freshwater streams to spawn if installation of watercourse crossing structures does 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 from the watercourse results in an increase in water temperature.

Distribution

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

High Conservation Value Identified

The East and West Branches of the Round Hill River, and the River itself, are designated HCVs for Atlantic salmon. The Round Hill River is not currently included in the Inner Bay of Fundy population river complex; however, evidence exists that salmon were found very near Medway.

Management Strategy

Round Hill, East Branch Round Hill, and West Branch Round Hill Rivers and all of their tributaries exceeding 50 cm in width will be assigned a SMZ (20- to 30-m no harvest) during forest management activities.

Any watercourse crossing installed over any of the three river systems will be done in accordance with the Company's provincial permit issued by Nova Scotia Environment.

Recovery Team updates will be incorporated into the HCVF assessment and appropriate actions undertaken.

Eastern White Cedar (Provincially – Vulnerable)

Forest Requirements

Eastern white cedar, found throughout eastern North America, 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, limestone parent material, or old field. Eastern white cedar grows from sea-level to 600 m elevations. It flourishes in rich swamps with an abundant flow of mineral-rich soil water (Burns and Honkala 1990).

Distribution

Tree species most commonly associated with cedar are balsam fir and tamarack (larch) but it will also be found with black spruce, white spruce, red spruce, black ash, and red maple on wetter swampy sites (Burns and Honkala 1990). In Nova Scotia cedar is known to occur at 32 sites found in Yarmouth, Digby, Annapolis, Kings, and Cumberland Counties (Newall 2005). Approximately 12,000 total mature individuals are estimated at these 32 sites and currently no live individuals are known in Medway. A single tree was identified in 2009 in Medway but has since been blown down as a result of a rotten trunk and adjacent harvesting. The ACCDC reports no locations of cedar in Medway.

High Conservation Value Identified

Considering the paucity of cedar in western Nova Scotia and the lack of known locations, designating a value of high conservation to ensure persistence of cedar lacks wisdom. If stands of cedar are discovered in Medway District, a HCV will be considered to protect this listed species.

Management Strategy

Despite no designation of HCV for eastern white cedar, all staff on site prior to and during harvesting operations adjacent to wetlands, lakes, rivers, and streams will increase their awareness of cedar in the harvest opening. If cedar is located in a SMZ, the buffer between the harvest opening and the cedar tree(s) will be at least 15 m.

If cedar is found in an upland area within a planned harvest opening, the cedar tree(s) will be incorporated into a wildlife clump or larger retention area, depending on the number of trees found.

Rockrose (Provincially – Endangered)

Forest Requirements

A perennial herb, Rockrose 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 (Newall 2007).

Distribution

Rockrose is known from only three communities in the Annapolis Valley of Nova Scotia (Kingston, Green Acres, and Greenwood) until recently, where an historic population near Greenfield was rediscovered in 2006 (Newall 2007). The ACCDC reports no observations of the species in the Medway area.

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 no historic populations known in the Medway area, no HCV is assigned for Rockrose as non-forested areas are not included in harvest plans.

Management Strategy

No management strategy in Medway is necessary for Rockrose at this time; however, as the ACCDC continues to survey in Medway, any discovery of Rockrose will trigger an HCV.

Prototype Quillwort (Federally – Special Concern; Provincially – Vulnerable)

Forest Requirements

Prototype quillwort is an aquatic-dependent submerged 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. None is known from the Medway area and COSEWIC (2005) reports none from surveys of inland lakes in Annapolis County (presumably close to or within Medway).

High Conservation Value Identified

No HCV is designated for Prototype quillwort at this time.

Management Strategy

No management strategy for Prototype quillwort is required in Medway.

Water-pennywort (Federally – Threatened; Provincially – Endangered)

Redroot (Federally – Threatened; Provincially – Threatened)

Long’s Bulrush (Federally – Special Concern; Provincially – Vulnerable)

Sweet Pepperbush (Federally – Special Concern; Provincially – Vulnerable)

For the purpose of this HCVF assessment, the above four species will be addressed in the following section as ACPF.

Forest Requirements

ACPF are small, slow growing herbaceous plants, found in and around wetlands that include lakes, rivers, bogs, and fens. 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 species known as ACPF is found in western Nova Scotia and in southern Cape Breton. Individually, these four species have been assigned high priority by the Recovery Team. None of these species is known to occur in Medway, but Sweet pepperbush has been found within 0.5 km (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 revealed none of the four ACPF species (ACCDC 2009).

High Conservation Value Identified

The riparian zone adjacent to all lakes, rivers, and fens is designated HCV for ACPF in Medway considering the distribution extent of ACPF in western Nova Scotia outside of Medway. Note that treed/shrub bogs and shrub swamps are not included as a HCV as the presence of these four ACPF in this landscape feature is unlikely because of the lack of open water and presence of woody vertical structure shading the ground.

Management Strategy

All lakes, rivers, and fens will be assigned a SMZ (20- to 30-m no harvest) during forest operations to prevent disturbance of potential ACPF species. The Company will continue to support annual botanical surveys in Medway by the MTRI and ACCDC and results will be evaluated for HCV.

Boreal Felt Lichen (Federally – Endangered; Provincially – Endangered)

Forest Requirements

Boreal felt lichen is almost completely found on the lower trunk or branches of balsam fir trees in mature coniferous forest stands. The species has generally been found on northerly slopes where wet, moist microclimatic conditions prevail. There is often an association with sphagnum mosses as a result of the microclimatic conditions required (Maass and Yetman 2002).

Distribution

Historic occurrences of Boreal felt lichen have not been more than 30 km inland along the Atlantic Ocean coast of Nova Scotia in forest stands dominated by balsam fir. Its post-1995 distribution was 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).

Between November 2005 and January 2006, five day-long surveys for Boreal felt lichen were conducted on Company land (Anderson 2006). Survey sites were selected using the following algorithm with a geographic information system (GIS): forest stands less than 25 km from the coast comprised of greater than 70 percent balsam fir and within 50 m of a bog or fen were mapped (Rob Cameron pers. comm., 2005). Not all sites were easily accessible. Of ten sites (greater than 2 ha) selected in Medway, five sites nearest the Bay of Fundy were surveyed. No Boreal felt lichen was observed nor was any *Coccocarpia palmicola* found (cyanolichen always present near Boreal felt lichen thalli in Nova Scotia) (Maass and Yetman 2002).

High Conservation Value Identified

Despite historic surveys by the Company in Medway for Boreal felt lichen and no occurrences from the lichen community known to remain near the Bay of Fundy (Maass and Yetman 2002), stands comprised of greater than 70 percent balsam fir within 25 km of the Bay of Fundy and 50 m of a wetland are determined to be HCV.

Management Strategy

Since the Company survey in 2005-2006, refinements have been made to the search algorithm (Rob Cameron pers. comm., 2008). These refinements, in addition to new (2007) forest inventory data, will be used to produce a new suite of potential Boreal felt lichen sites. Overlap with Medway operating plans in sites that were not previously surveyed for Boreal felt lichen will trigger an inspection of the proposed harvest area for microclimatic conditions (wet, moist microclimate and presence of sphagnum moss). If the necessary conditions are present, the opening will be delayed for harvest until a survey can be conducted. The Company will rely on expert recommendations to determine actions if Boreal felt lichen is found in Medway.

As a recent invitee to observe the Boreal Felt Lichen Recovery Team, the Company will continue to seek advice from and respect recommendations of the Team to promote recovery of Boreal felt lichen.

The Company will continue to support species at risk surveys in Medway by the ACCDC and MTRI.

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

The Atlas of Canada indicates that there are very few Canadian endemic plant species in Nova Scotia (1-3), all of which are located on the Bay of Fundy coast⁸. No endemic plant species are identified for the interior area, in which the Medway forest lands are located (Figure 7).

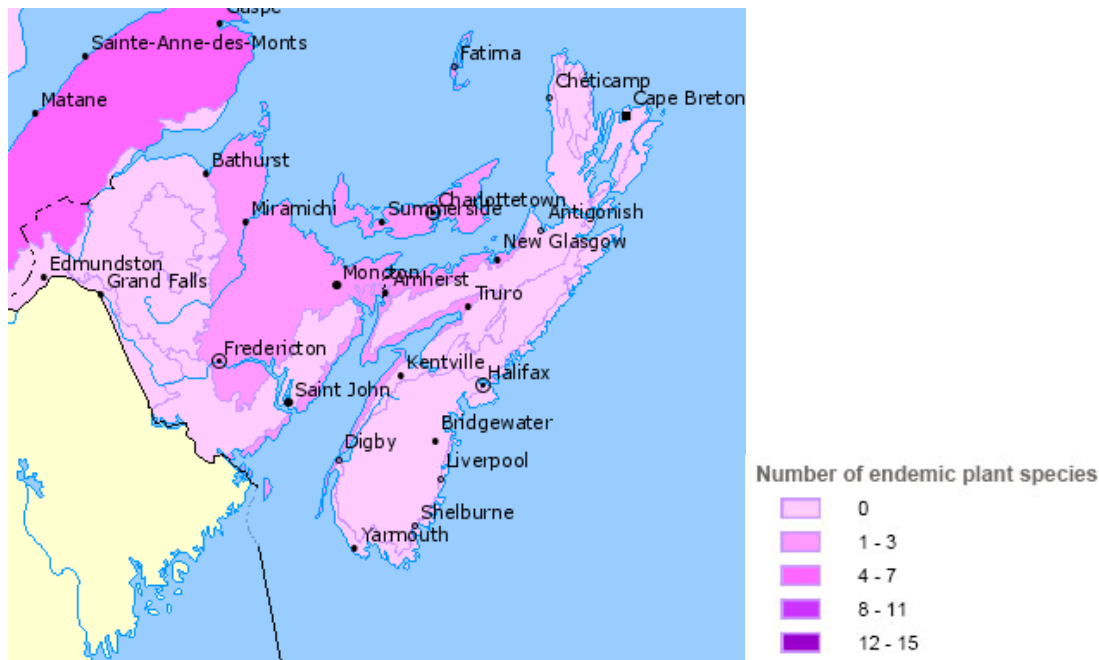


Figure 7. Endemic species numbers for the Maritimes (Atlas of Canada)

Nova Scotia has one endemic beetle species (identified so far), *Tricholochmaea sablensis*, which is found only on Sable Island. However, recent work has failed to discover any specimens, casting some doubt on whether the species still exists.⁹ Sable Island is not near the forest lands.

Atlantic whitefish is endemic to Nova Scotia, but this species now occurs only in the Petite Riviere watershed and is thought to be extirpated from the Tusket system.¹⁰

The Blanding's turtle population in Nova Scotia is genetically distinct (including behavioral and physical differences) from populations in Ontario and the United States¹¹, but is not identified as a separate species and therefore cannot be considered an endemic species.

There are no bird species endemic to Nova Scotia.¹²

⁸ Atlas of Canada – Endemic Plant Diversity map; <http://atlas.nrcan.gc.ca/site/english/maps/environment/>

⁹ Atlantic Canada Coleoptera; www.chebucto.ns.ca/Environment/NHR/atlantic_coleoptera.html

¹⁰ Bluenose Coastal Action Foundation, Petite Riviere Watershed Brochure; www.coastalaction.org

¹¹ Nova Scotia Species at Risk webpage: www.speciesatrisk.ca/

¹² Nova Scotia tourism; <http://novascotia.com/site-ns/media/travelmedia2/birdwatching.pdf>

Of the 149 species of land mammals in Canada, only five are endemic to Canada (Nagorsen 2004). Of these, the Maritime shrew (*Sorex maritimensis*) and the Gaspé shrew (*Sorex gaspensis*) are endemic to the Maritimes. The Gaspé shrew is found only on the Gaspé Peninsula in Quebec and on Cape Breton Island¹³ and does not occur in Medway. However, the Maritime shrew is found at the overgrown edges of freshwater marshes in Nova Scotia and New Brunswick (Bowers et al. 2004). No ACCDC records exist for Maritime shrew in Medway and the provincial NS DNR has assigned it a general status of green (not believed to be sensitive or at risk) (KBM 2009).

High Conservation Value Identified

None assigned.

Management Strategy

None 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 webpage interactive mapping, there are no important bird areas located near the Medway forest; most IBAs are located along the coast.¹⁴ Migratory bird sanctuaries are discussed under Question 6; none is located within or adjacent to Medway. Similarly, the Minas Basin of the Bay of Fundy is a crucial feeding and resting stop for millions of migratory shorebirds each year.¹⁵ However, the Minas Basin is not adjacent to the Medway forest lands (KBM 2009).

In 2005-2007 a research project on invertebrates as indicators of bog health was carried out by various researchers from Acadia University. One of the objectives of the project was to determine diversity patterns for odonates (dragonflies and damselflies) and tabanid flies (horseflies and deerflies) in treed bogs relative to type and intensity of forestry. While the complete results and recommendations have not yet been published, preliminary results show that treed bog areas contained 54 species of dragonflies and damselflies, representing 47 percent of Nova Scotia's species. Several rare and specialized species were found, including elfin skimmers, little bluets, delicate emeralds, and incurvate emeralds. Thirty-six species of horse and deer flies were identified, representing approximately 72 percent of Nova Scotia's species. Three of these last species were extremely rare or disjunct, including *Merycomyia whitneyi*, *Chrysops pudicus* and *C. delicatulus*. Only 20 specimens of *M. whitneyi* have been reported in North America (KBM 2009).

Proclaimed by government as Nova Scotia's official fish, regionally significant seasonal concentrations of Brook trout occur in Medway (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) in Medway (Reg

¹³ Nova Scotia Species at Risk webpage: www.speciesatrisk.ca/municipalities/sar_shrew.htm

¹⁴ IBA Canada Interactive Map Viewer; www.bsc-eoc.org/iba/mapviewer.jsp

¹⁵ Province of Nova Scotia's Fundy Shorebirds Home Page, available at www.speciesatrisk.ca/fundyshorebirds/

Baird pers. comm., 2009). 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 (2006) illustrate no rivers used by this population of salmon extending into Medway. As noted, however, a single 2001 record of Atlantic salmon exists from the Round Hill near Medway. Once known as one of the “best rivers in Nova Scotia for salmon” (George Mansfield pers. comm., 2009), the Mersey River does not support a run of salmon and no passage is possible even into Lake Rossignol (well south of Medway) 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; however, the lower reaches of the Medway River do support a small run (George Mansfield pers. comm., 2009).

High Conservation Value Identified

All treed bogs are designated HCV as a result of the pending research publication on invertebrates as indicators of bog health. 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

No timber harvesting will be conducted in any treed bog identified through the forest resource inventory (FRI). Sandy Bottom, Boot, Gull and Frog Lakes, as well as the Liverpool and West Branch Liverpool Rivers will be assigned a SMZ (20- to 30-m no harvest) during forest management activities. Any watercourse crossing installed over the Liverpool and West Branch Liverpool River systems will be done in accordance with the Company’s provincial permit issued by Nova Scotia Environment.

Atlantic Salmon Recovery Team updates will be incorporated into the HCVF assessment and appropriate actions undertaken. The Medway River Salmon Association is expected to continue making input on forest management activities as an active participant in the Company’s Forest Advisory Committee. The Company will continue to support trout monitoring and research in Medway through the activities of Trout Nova Scotia and MTRI.

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)?

The determination of what constitutes a regionally significant species and the associated critical habitat is challenging (WWF 2005). Critical habitat is most often described as the landscape structure necessary to sustain a species throughout its life cycle. Evaluating regional significance is not straight forward as no strict definition exists for determining significant and the list of species present will naturally vary from region to region.

After consultation with a regional expert (G. Forbes pers. comm., 2009), the Company decided to narrow consideration of regionally significant species to those that are forest-dependent (Table 3). Contributing to this decision was the fact that wetlands are currently protected throughout the province (Wildlife Habitat and Watercourses Protection Regulations 2002¹⁶, Operational Bulletin Respecting Alteration of Wetlands 2006) and the Company's Eastern Habitat Joint Venture agreement signed with the NS DNR. In addition, forest management activities focus on forested areas and thus operations (machinery) naturally avoid open areas (e.g., bogs, fens, marshes, meadows, and swamps).

Table 3
REGIONALLY SIGNIFICANT SPECIES WITH KNOWN LOCATIONS IN THE MEDWAY FOREST
THAT ARE NOT LEGALLY PROTECTED AND
HAVE NOT PREVIOUSLY BEEN ADDRESSED IN QUESTIONS 1-3 (KBM 2009)

Species	Status	Notes
Trailing clubmoss <i>Lycopodium complanatum</i>	<ul style="list-style-type: none"> G5 (Secure) S3? (may be Vulnerable) 	One occurrence. Habitat includes open woodlands, thickets, heathland, and rocky slopes; boreal forest, north to treeline and circumpolar. ¹⁷
Slim-leaf witchgrass <i>Dichanthelium linearifolium</i>	<ul style="list-style-type: none"> G5 (Secure) S2? (may be Imperiled) 	One occurrence. Occurs on dry, sandy, and gravely prairies and open woodlands. ¹⁸
Checkered rattlesnake-plantain <i>Goodyera tessellata</i>	<ul style="list-style-type: none"> G5 (Secure) S3 (Vulnerable) 	One occurrence. Found in partial to full shade in upland or low-lying coniferous or mixedwoods, as well as in swamps and heavily wooded portions of bogs. ¹⁹
Downy rattlesnake-plantain <i>Goodyera pubescens</i>	<ul style="list-style-type: none"> G5 (Secure) S1 (Critically Imperiled) 	One occurrence. Range includes the eastern United States and much of eastern Canada; ²⁰ found in wooded habitats with acid surface conditions; most frequently on moist humus soils in shady, upland woods of hemlock, pine, oak, or maple; less frequent in lowland woods, bogs, swamps. ²¹

¹⁶ Government of Nova Scotia at <http://www.gov.ns.ca/just/regulations/regs/fowhwp.htm>

¹⁷ borealforest.org; www.borealforest.org/ferns/fern10.htm

¹⁸ Grasses of Iowa webpage, Iowa State University; www.eeob.iastate.edu/research/iowagrasses/

¹⁹ Muskoka Flora web database, prepared by the Royal Ontario Museum and the University of Toronto, at www.library.utoronto.ca/muskoka_flora/index.html

²⁰ USDA Plants Database; <http://plants.usda.gov/java/profile?symbol=GOPU>

²¹ Flora of North America, www.eFlora.org

Species	Status	Notes
Necklace spike sedge <i>Carex ormostachya</i>	<ul style="list-style-type: none"> G4 (Common) S1 (Critically Imperiled) 	One occurrence. Prefers moist to dry deciduous, evergreen, or mixed deciduous-evergreen forests, frequently sandy gravel or disturbed soils; found in the northeastern United States and parts of southeastern Canada. ²²
Hay sedge <i>Carex argyrantha</i>	<ul style="list-style-type: none"> G5 (Secure) S3S4 (Common/Vulnerable) 	One occurrence. Found in dry clearings, open woods, on acidic, rocky, or sandy substrates, or on rock outcrops; found in the northeastern United States and eastern Canada. ²³
Ghost antler <i>Pseudevernia cladonia</i>	<ul style="list-style-type: none"> G2G4 (Apparently secure to imperiled) S-rank unknown 	Not known from Medway. Known from two other locations on Company land [Anderson 2006 and 2008]; found in cool, moist coastal coniferous forests dominated by red spruce or balsam fir (COSEWIC 2006b).
Four-toed salamander <i>Hemidactylium scutatum</i>	<ul style="list-style-type: none"> G5 (Secure) S3 (Vulnerable) 	Two sightings. Prefers bog/fen habitats, forested wetlands, riparian areas, or scrub-shrub wetlands; found in the eastern United States and eastern Canada. ²⁴
Red crossbill <i>Loxia curvirostra</i>	<ul style="list-style-type: none"> G5 (Secure) S3S4 (Vulnerable/Apparently Secure) 	One sighting. Found in coniferous and mixed forests; also pine savanna and pine-oak habitats; in migration and winter may also occur in deciduous forest, and more open scrubby areas; nests in conifers. ²⁵
Northern Goshawk <i>Accipiter gentilis</i>	<ul style="list-style-type: none"> G5 (Secure) S3B (breeding population Vulnerable) 	Three occurrences within 500 m of Medway District. Nests in mature, high canopy closure stands (10-100 ha) of most late seral species; often have 1-5 alternative nest areas; forages within forest. ²⁶
Baltimore oriole <i>Icterus galbula</i>	<ul style="list-style-type: none"> G5 (Secure) S3B (breeding population Vulnerable) 	One sighting. Prefers open woodland, deciduous forest edges, riparian woodland, partly open situations with scattered trees, orchards, or shade trees. ²⁷
Scarlet tanager <i>Piranga olivacea</i>	<ul style="list-style-type: none"> G5 (Secure) S2B (breeding population Imperiled) 	One sighting. Inhabits deciduous forest and mature deciduous woodland, including deciduous and mixed swamp and floodplain forests and rich moist upland forests; most common in areas with a relatively closed canopy and a dense and diverse shrub understory; able to breed successfully in relatively small patches of forest; found in southeastern Canada as far west as Manitoba, and in the eastern half of the United States. ²⁸

²² Muskoka Flora web database, prepared by the Royal Ontario Museum and the University of Toronto, at www.library.utoronto.ca/muskoka_flora/index.html

²³ USDA Plants Database; <http://plants.usda.gov/>

²⁴ Nature Serve Explorer, as cited above

²⁵ Nature Serve Explorer, as cited above

²⁶ Squires and Reynolds 1997

²⁷ Nature Serve Explorer, as cited above

²⁸ Nature Serve Explorer, as cited above

Species	Status	Notes
Boreal chickadee <i>Poecile hudsonica</i>	<ul style="list-style-type: none"> G5 (Secure) S4 (Apparently secure) 	Reported from Medway (Lavers and Staicer 2009). Found in conifer forests, especially spruce and tend to remain under the canopy, rarely venturing out in open (Erskine 1992).
Gray jay <i>Perisoreus canadensis</i>	<ul style="list-style-type: none"> G5 (Secure) S4 (Apparently secure) 	Breeding known from Medway (Erskine 1992). Coniferous and mixed coniferous-deciduous forests where spruce is present; perch and search for berries, carrion, fungi; nests at low to moderate height near opening to increase southern exposure of nest. ²⁹
Canada warbler <i>Wilsonia canadensis</i>	<ul style="list-style-type: none"> G5 (Secure) S4B (Breeding population apparently secure) 	Known from Medway (Lavers and Staicer 2009, ACCDC 2009). Inhabits deciduous and coniferous forests but prefers mixed deciduous/coniferous with a well developed understory near water (Conway 1999).
Olive-sided flycatcher <i>Contopus cooperi</i>	<ul style="list-style-type: none"> G4 (Apparently secure) S4B (Breeding population apparently secure) 	Known from Medway (Lavers and Staicer 2009, ACCDC 2009). Found predominantly in coniferous forest near edges or natural openings. Also in early successional forest if residual live trees and/or snags present for singing and foraging perches (Altman and Sallabanks 2000).
Common nighthawk <i>Chordeiles minor</i>	<ul style="list-style-type: none"> G5 (Secure) S4B (Breeding population apparently secure) 	Known from Medway (Lavers and Staicer 2009, ACCDC 2009). Nests in open areas including logged, slashburned, and open or younger forest. Forages in flight on flying insects at dawn and dusk (Poulin et al. 1996).
Eastern phoebe <i>Sayornis phoebe</i>	<ul style="list-style-type: none"> G5 (Secure) S2S3B (breeding population Imperiled/Vulnerable) 	One sighting. Prefers open woodland, situations with scattered trees, farmlands, and suburbs, usually near water; nests on cliffs, banks, or in ravines in open and riparian woodland or farmland with scattered trees, under bridges and eaves, sometimes in buildings; found across Canada and eastern United States. ³⁰
Common goldeneye <i>Bucephala clangula</i>	<ul style="list-style-type: none"> G5 (Secure) S2B, S4N (breeding population Imperiled; non-breeding population Apparently Secure) 	One sighting. Inhabits ponds, lakes, rivers and coastal bays, wintering primarily in bays and estuaries, less commonly on rivers and lakes; usually nests near a pond, lake, or river, but may nest in woodland up to a mile from water, making use of a natural tree cavity (deciduous) or in an abandoned woodpecker hole; often nests in same area in successive years; found throughout Canada and in the northern States. ³¹
Southern flying squirrel <i>Glaucomys volans</i>	<ul style="list-style-type: none"> G5TNR (subspecies not ranked) SNR (Not ranked) 	Not known from Medway, but from adjacent lands (Lavers 2004). Prefer mixedwood forest with large shade-tolerant trees for cavities and frequent standing dead snags (Lavers 2004).

²⁹ Strickland and Ouellet 1993

³⁰ Nature Serve Explorer, as cited above

³¹ Nature Serve Explorer, as cited above.

Species	Status	Notes
Fisher <i>Martes pennanti</i>	<ul style="list-style-type: none"> • G5 (Secure) • S2 (Imperilled) 	Two sightings. Inhabits upland and lowland forests (coniferous, mixed, and deciduous); occurs primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover; generally avoids areas with little forest cover or significant human disturbance, preferring large areas of contiguous interior forest; found throughout Canada, the northern States, and California. ³²

High Conservation Value Identified

In concert with a focus on only forest-dependent species, a variety of forested areas and structural elements is provided HCV status. To address the needs of the above species individually would be extraordinarily difficult. More efficiently, the following are designated as HCV for regionally significant species' critical habitat:

- Stick and cavity nests of raptors, owls, Common goldeneyes, and flying squirrels
- Wildlife clumps as required under the Wildlife Habitat and Watercourses Protection Regulations 2002
- Special management zones (20- to 30-m no harvest)
- Legacy trees left during timber harvesting
- Old growth forest

Management Strategy

Staff will continue to receive training in stick and cavity nest recognition and will alert Company supervisors if such nests are discovered. Raptor, bald eagle, osprey, and Great Blue heron nests will be buffered during forest operations with a 100 to 200-m no harvest zone wherever possible. Operations will only occur outside of fledging season in the vicinity of known nests.

At least 16 snag trees per hectare will be left in mosaic and variable retention harvests. Wildlife clumps will be left in accordance with the Wildlife Habitat and Watercourses Protection Regulations 2002. SMZs (20- to 30-m no harvest) will be left on watercourses greater than 50 cm wide and on all lakes.

Timber harvesting in the old growth zone (LEMZ process) is prohibited and any forest stand encountered in the planning process greater than 120 years old will be examined to determine if old growth forest is present and should be designated HCV and considered for incorporation into the Unique Areas Program.

The Company will continue to support annual botanical surveys in Medway by the MTRI and ACCDC and results will be evaluated for HCV. Maximum opening size will be limited to 80 ha; however, Company data illustrate an average opening size of 25 ha.

³² Nature Serve Explorer, as cited above.

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.

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

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.³³ 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.³⁴ 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.³⁵ Several at risk Atlantic Coastal Plain species are found in the local municipalities (refer to Table 1); however, according to the ACCDC, only those listed below have documented occurrences on the Medway forest lands (rank and habitat details are provided in Table 2, under Question 4).³⁶

- Howe sedge
- Zigzag bladderwort
- Grass-leaved goldentop
- Southern bog clubmoss
- Low water milfoil
- Swamp rose
- Pale manna grass

The Atlantic Coastal Plain community can be considered to occur at locations where several of these species exist together. On the Medway forest lands, this occurs only at Stony Lake, where the Zigzag bladderwort, Low water milfoil, and Southern bog clubmoss were observed in 2001 (ACCDC 2009). In addition to ACPF, southern flying squirrels are thought to be at the edge of their natural range and have been addressed in Question 4 (Lavers and Staicer 2009).

Eastern pipistrelle bats found only in southwest Nova Scotia are thought to be rare and now disjunct from their natural range as few Eastern pipistrelle are known from southern New Brunswick and Maine (Farrow 2007). Female pipistrelles in Nova Scotia have been found to nest only in *Usnea* lichen found in spruce and fir trees in conifer forests. Farrow (2007) found evidence of pipistrelle bats in and adjacent to the Medway District.

White-footed mouse is found in eastern North America, but only in three distinct areas (southern Nova Scotia, southern Ontario, and southern Alberta/Saskatchewan) in Canada. The nearest range outside of Nova Scotia is southern Maine. This mouse inhabits dry deciduous forest where it lives under logs,

³³ Nova Scotia's Coastal Plain Flora; www.speciesatrisk.ca/coastalplainflora/about.htm

³⁴ Nova Scotia's Coastal Plain Flora; as cited above

³⁵ Canadian Intergovernmental Conference Secretariat, Atlantic Coastal Plain Species at Risk Fact Sheet; www.scics.gc.ca/pdf/83076106_e.pdf

³⁶ For the full listing of Atlantic Coastal Plain species that are found in Nova Scotia, refer to: www.speciesatrisk.ca/coastalplainflora/ACPF_CompleteList.htm

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

Similarly identified for ACPF in Question 1, all lakes, rivers, and fens are designated HCV for ACPF in Medway District. Old forest and legacy trees left after harvest are designated HCV for Southern flying squirrel as identified in Question 4.

The dependence of Eastern pipistrelle bats on *Usnea* lichen growing on spruce and fir trees in Medway is noteworthy. However, *Usnea* lichen is not rare in Medway and has been found well distributed by Company staff conducting lichen surveys. Paramount to pipistrelle survival are the host spruce and fir trees remaining in abundance throughout the District to enable the persistence and dispersal of *Usnea* lichen. With the management objective in Medway District to increase late seral species and old forest, the supply of future spruce trees is not in peril and does not require an HCV.

Management Strategy

All lakes, rivers, and fens will be assigned a SMZ (20- to 30-m no harvest) during forest operations to prevent disturbance of potential ACPF species. The Company will continue to support annual botanical surveys in Medway by MTRI and ACCDC and results will be evaluated for HCV. At least 16 snag trees per hectare will be left in mosaic and variable retention harvests.

Timber harvesting in the old growth zone (LEMZ process) is prohibited and any forest stand aged greater than 120 years old will be examined to determine if old growth forest is present and should be designated HCV and considered for incorporation into the Unique Areas Program.

Silvicultural prescriptions will be based on the Forest Ecosystem Classification (NS DNR 2006) to ensure that harvested sites and the regenerating forest stands are managed accordingly.

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 8, from the Atlas of Canada.³⁷ The Medway District is included in this area.

³⁷ Atlas of Canada, available at <http://atlas.nrcan.gc.ca/>

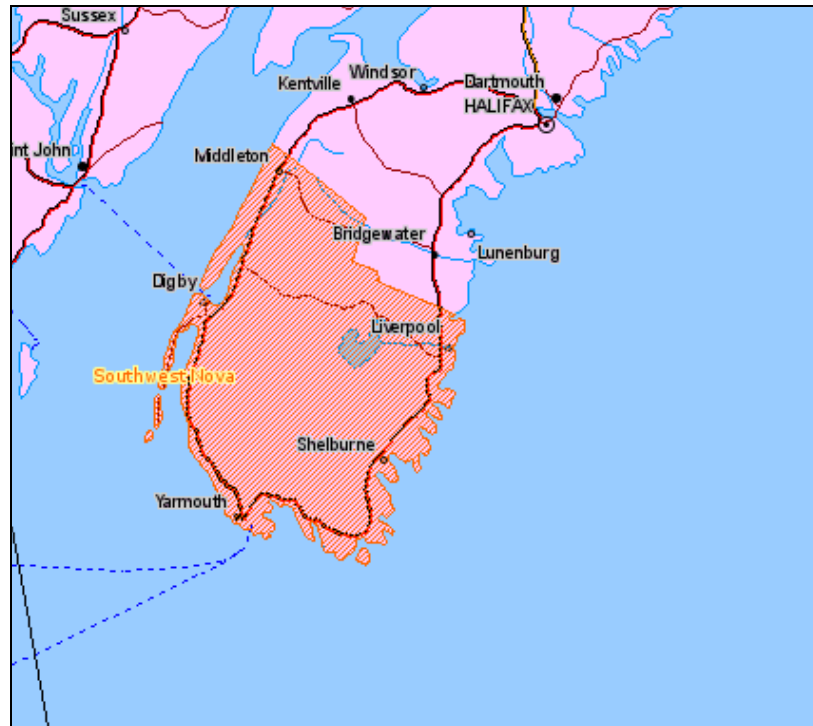


Figure 8. UNESCO Biosphere Reserve “Southwest Nova” (Atlas of Canada)

UNESCO describes this area, called ‘Southwest Nova’ as follows:

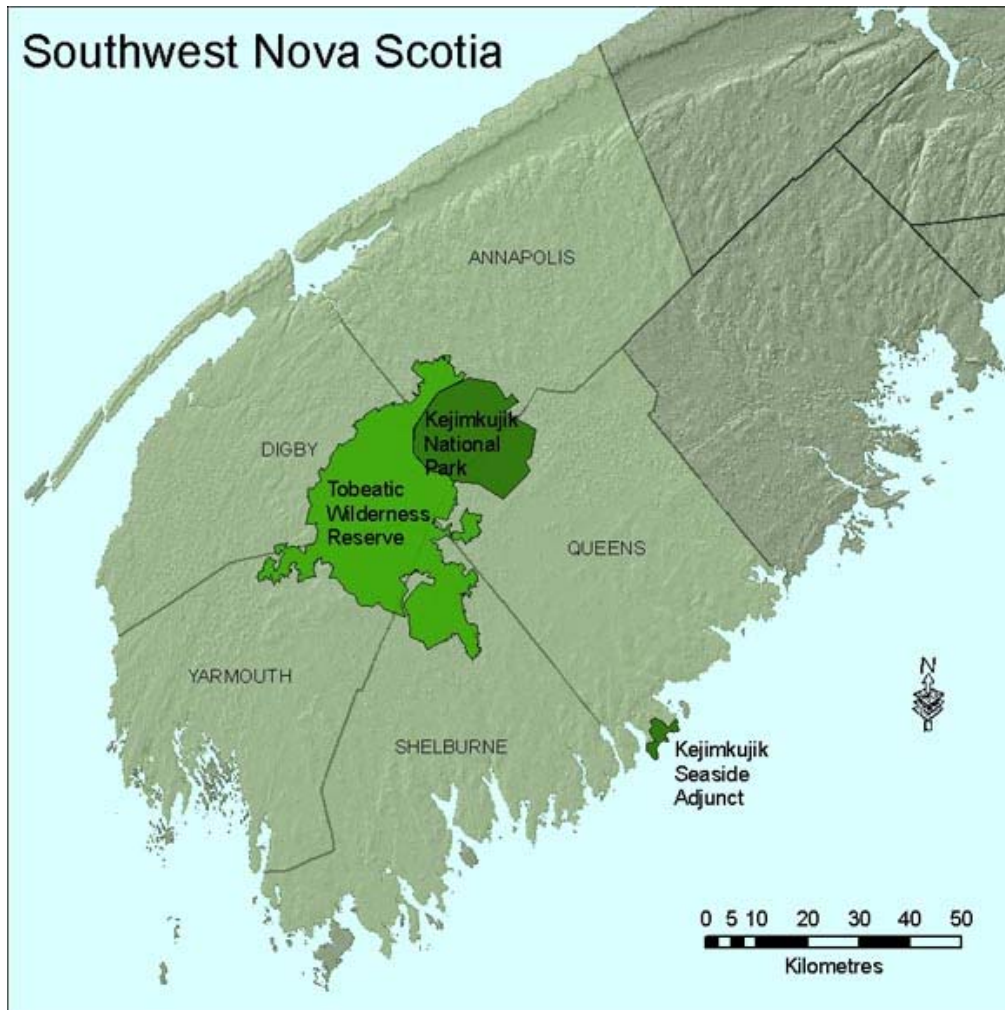
Southwest Nova represents the natural region of southwestern Nova Scotia. This encompasses the five Counties: Queens, Shelburne, Yarmouth, Digby, and Annapolis. The biosphere reserve comprises major landscapes of the province, which exist in a near-pristine condition with intact ecosystem structure, processes, and functions. Located in the boreal needleleaf 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*).³⁸

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.³⁹

Within the Southwest Nova Biosphere Reserve, the core area is comprised of the Tobeatic Wilderness Area and Kejimikujik National Park (Figure 9).

³⁸ Canadian Biosphere Research Network at <http://www.biosphere-research.ca/index.htm>

³⁹ Southwest Nova Biosphere Reserve Association at <http://www.snbra.ca/reserves.htm>



**Figure 9. Southwest Nova Biosphere Reserve core area
(map data courtesy of Nova Scotia Geomatics Centre)**

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 forest land 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.⁴⁰

⁴⁰ www.pc.gc.ca/pn-np/ns/kejimikujik/index_e.asp

Provincial

Parcels of Crown land adjacent to and within Medway District are currently under protection or undergoing designation. At present, the Tobetic (WA29), McGill Lake (WA27), and Cloud Lake (WA26) Wilderness Areas as well as the West Branch Medway River Nature Reserve (NR20) have been designated by the Crown (Figure 10).

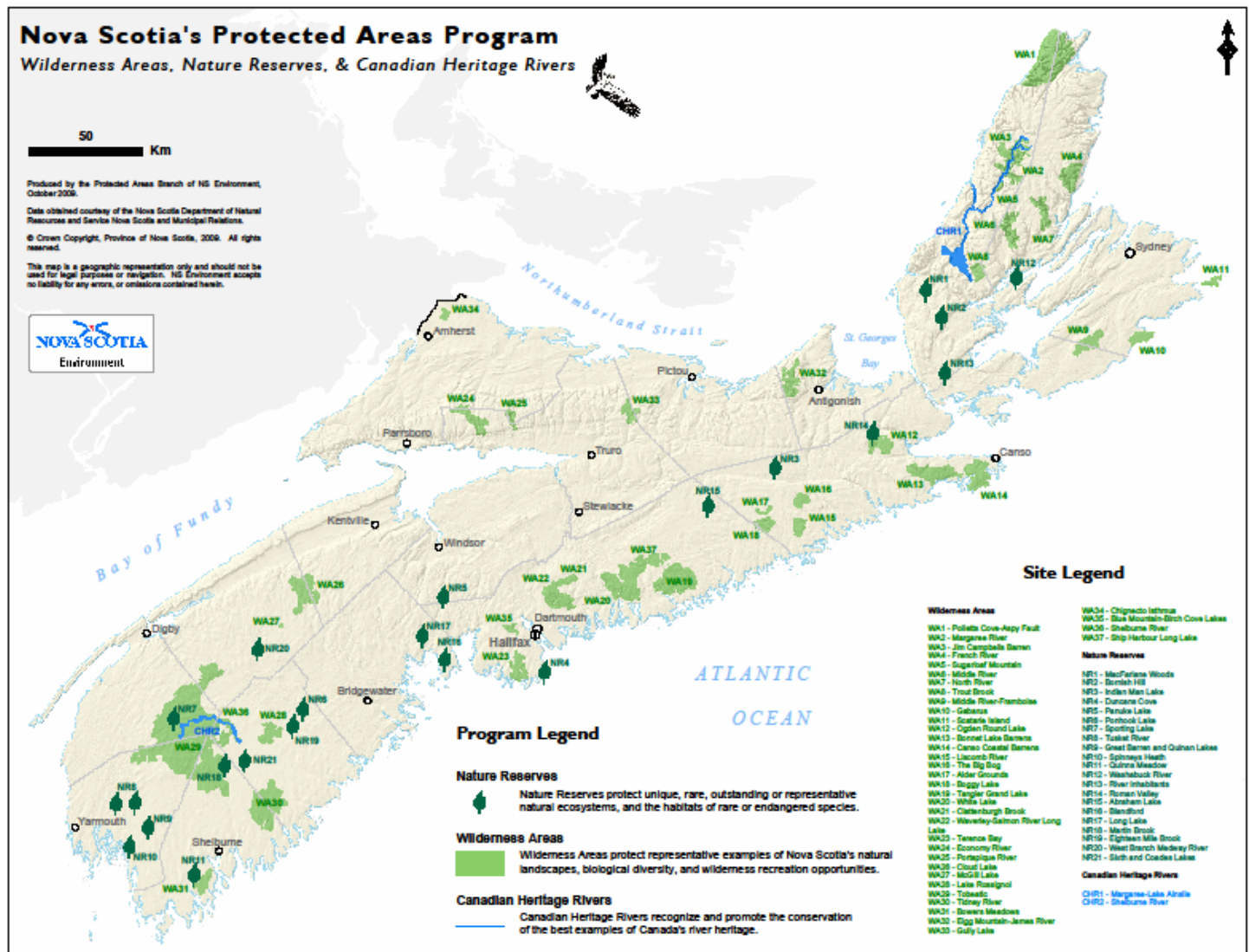


Figure 10. Four protected areas currently exist in Annapolis County within and adjacent to the Medway District (Nova Scotia Environment)⁴¹

⁴¹ Nova Scotia Department of Environment at http://gov.ns.ca/nse/protectedareas/docs/ProtAreas_map_color.pdf

Parcels of Company land in Medway purchased by the Crown and whose designation is planned as Provincial Park Reserves include Mickey Hill, Fisher Lake, Taylors Lake, Kempt, Roxbury, and Cedar Lake. Lands awaiting designation as Wilderness Areas include Little Cranberry Lake, McGill Lake, and Little River. Parcels yet to be designated as Nature Reserves include Porcupine Lake, Medway Lakes, and Lambs Lake (Figure 11).

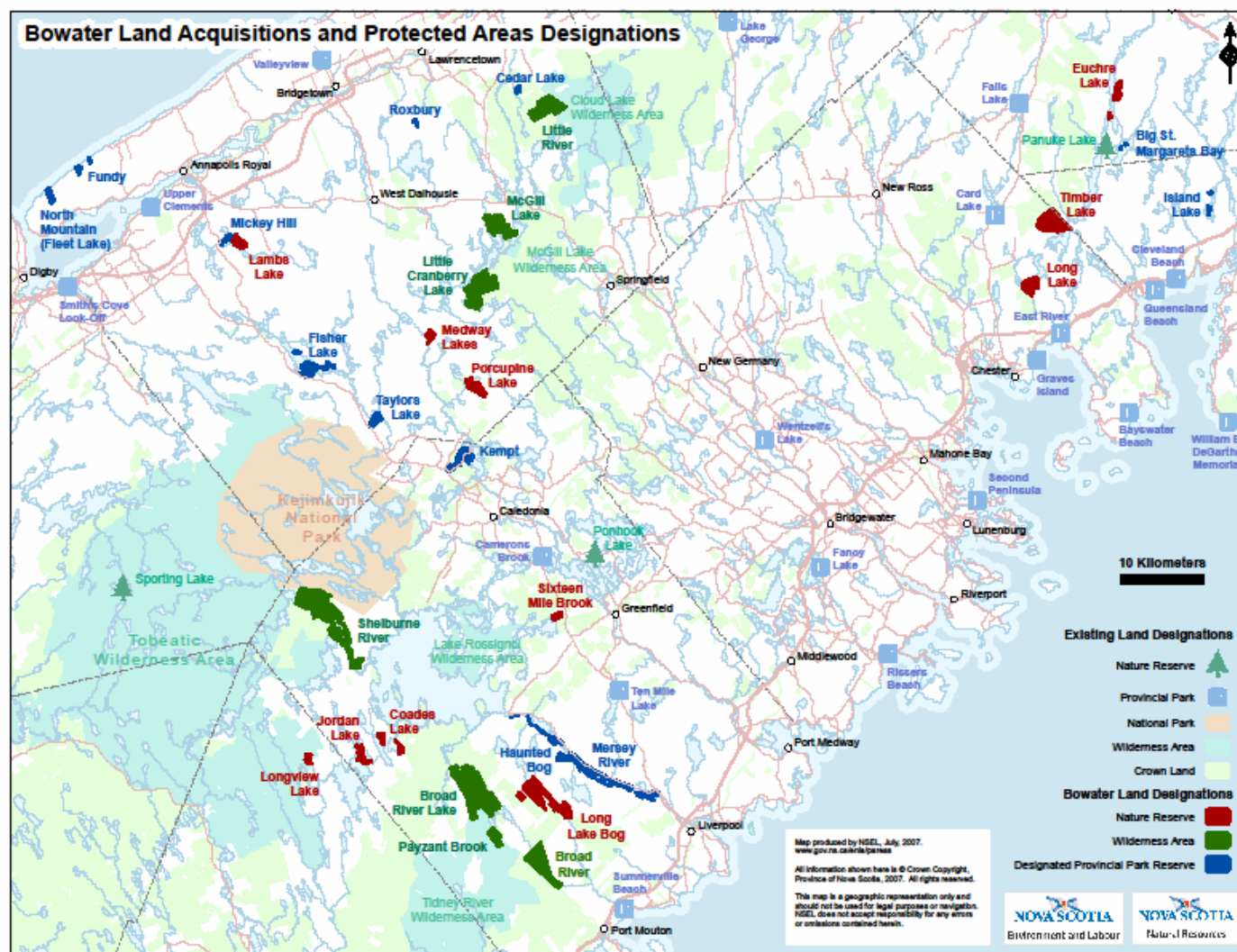


Figure 11. Land acquisitions from the Company and their proposed provincial designations (Nova Scotia Environment)⁴²

⁴² Nova Scotia Department of Environment at <http://gov.ns.ca/nse/protectedareas/docs/BowaterPlanningMap.pdf>

High Conservation Value Identified

Company lands within 500 m of a designated National Park (Kejimikujik) or Wilderness Area (Tobeatic, McGill Lake, and Cloud Lake) or 50 m of a Nature Reserve (West Branch Medway River) are designated HCV.

Management Strategy

Timber harvesting or road building operations identified on annual operating plans within 500 m of a National Park or Wilderness Area and 50 m of a Nature Reserve will be reviewed with the appropriate agency. Recommendations from the agency will be addressed during management planning.

Former Company lands designated Wilderness Areas or Nature Reserves in future by the Crown would undergo review if applicable upon designation.

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 Two Countries, One Forest (Trombulak et al. 2008). This analysis of conservation priority for the Northern Appalachian/Acadian Ecoregion summarises past work by both the Nature Conservancy and the Wildlands Project and then builds on these data and analysis. 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 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. The Medway District provides a functioning corridor between the 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 determined the Medway District to be of high conservation value, but of little conservation priority.

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 meant the lands contributed little to regional conservation goals and scores between 1 and 20 illustrated 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 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).

Of importance to note under Question 7 is the work done through the Colin Stewart Forest Forum (CSFF), which is addressed in Question 10. Where Question 7 addressed a broader scale of regional planning, focus of the HCV result is based solely on the work by Two Countries, One Forest.⁴³

High Conservation Value Identified

The Two Countries, One Forest examination of conservation priority in the Northern Appalachian/Acadian Ecoregion concluded that 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 Medway District is valuable as an intact forest free from human expansion, and recommend elevating the District to HCV status.

As discussed in prior questions, the utility of designating the entire Medway District as HCV is questionable. What remains crucial is the function the District plays as a corridor from adjacent protected areas. Hence, the HCV designated is the LEMZ old growth and low impact zones which provide a corridor of continuous forest cover between these protected areas.

Management Strategy

No interventions in the old growth zone and partial harvesting in the low impact zone will ensure the corridor between adjacent protected areas remains intact.

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

8. Does the forest contain naturally rare ecosystem types?

Two sources of data were considered in addressing rare ecosystem types: 1) Nova Scotia Environment's significant ecosite database and 2) the examination of the Northern Appalachian/Acadian Ecoregion by Two countries, One forest.

⁴³ Two Countries, One Forest at <http://www.2c1forest.org/atlas/datawarehouse.html>

Nova Scotia Environment's significant ecosite database identified calcareous forest (33 ha), fen-bog complex (5 ha), hemlock forest (475 ha), inland barren (44 ha), red pine forest (34 ha), vernal pond (1 ha), and red oak forest (20 ha) as significant in or intersecting Medway District. Total area identified as a significant ecosite is 672 ha (0.7 percent of Medway District).

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

A single freshwater wetland community east of East Stoney Lake was identified through 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 900 m east. Two large tracts of viable matrix forest (delineated because of their ability to provide linkages to core reserves) overlap Company land 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.

Stewart (2009) also suggests that red maple fens are a unique and thus rare ecosystem in southwestern Nova Scotia. The forest ecosystem classification of vegetation types in the western ecoregion (Neily et al. 2006) for red maple fens is W11: Red maple, poison ivy forest. Known as a wetland forest comprised principally of red maple, other distinguishing features would be a forest floor of sphagnum, a herb layer of grasses and sedges, and a community usually found adjacent to still water.

High Conservation Value Identified

Ecosites identified in Nova Scotia Environment's significant ecosite database are designated as HCV. East Stoney Lake and the wetland 900 m east of East Stoney Lake are designated as HCV. Red maple fens are designated as HCV.

Management Strategy

Significant ecosites on Medway lands will be managed according to the NS DNR forest ecosystem classification as follows:

- 1) Calcareous forest (sugar maple) will be assessed on the ground prior to harvest, and if the ecosite is predominantly tolerant deciduous (sugar maple) trees, only selection harvesting (30-40 percent removal) will be prescribed to ensure the ecosite remains in tolerant deciduous cover over time.
- 2) The single patch of fen-bog complex is predominantly located off Company land and forest operations do not occur in wetlands.
- 3) During forest planning, hemlock forest found on Company land will be assessed on the ground prior to harvest, and if hemlock is found to comprise the majority of the canopy, the primary silvicultural objective will be maintenance of hemlock as dominant on the site.
- 4) Inland barrens will not be included in harvest planning.
- 5) During forest planning, red pine forest will be assessed on the ground and extent of red pine composition determined. If red pine is dominant in the stand, the primary silvicultural objective will be maintenance of red pine as dominant on the site.
- 6) Vernal ponds are identified in 13 locations and comprise only 1 ha in total in Medway. Any wet area or known wetland as identified in the NS DNR wetland database will not be operated in and will be afforded a SMZ (20- to 30-m no harvest) if open water is present.
- 7) The ecosite of red oak forest identified in Medway is only partially (~ 30 percent) located on Company land north of Lake Mulgrave. If silvicultural intervention is scheduled, this site will be assigned a selection harvest prescription provided red oak dominates the canopy of the ecosite.

The wetland identified east of East Stoney Lake by Two Countries, One Forest will not receive any forest intervention nor will East Stoney Lake or the SMZ (20- to 30-m no harvest) adjacent. The connection or corridor between these two blocks, where forested, will be incorporated into forest harvesting management plans.

Red maple fens were assigned a wetland class of either treed fen or hardwood swamp in the most recent version (2007) of the Company's FRI. Neither of these wetland types are prescribed for intervention and therefore red maple fens will not be disturbed during forest operations.

The Company will not operate in any wetland identified by the NS DNR wetland database and will continue to identify and map unknown wetlands discovered by field personnel.

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)?

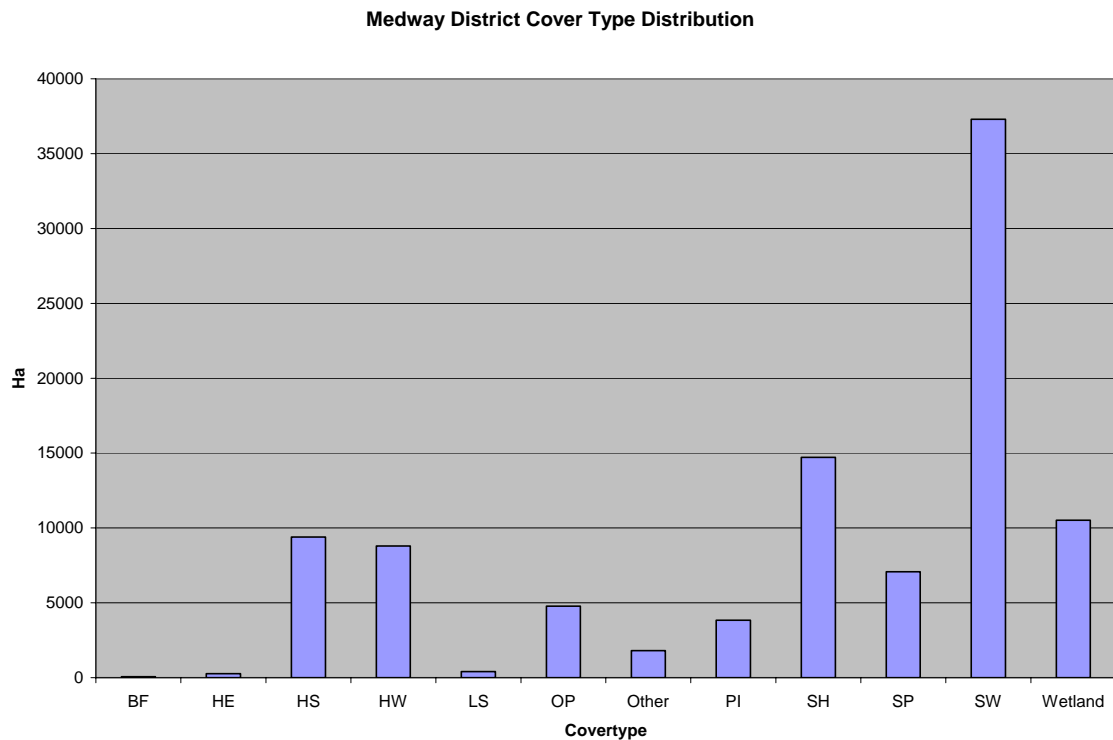
Numerous authors agree that old growth forest has declined in eastern North America and that forest management activities have simplified forest patterns and created even-aged forests (Duinker and Bush 2009). Historical old growth Acadian forest is expected to have consisted of shade-tolerant species,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

Old growth definitions for the Acadian forest include the following features:⁴⁴

- Uneven, multi-aged stand structure
- Average age of dominant trees at half their maximum longevity (approximately 150+ years for most shade-tolerant trees)
- Some trees approaching maximum longevity (300+ years for most shade-tolerant, late-successional, Acadian tree species)
- Standing dead and dying trees
- Fallen, coarse, woody debris in varying states of decay
- Natural regeneration of trees within canopy gaps

Current conditions in Medway District are illustrated in Figures 12 and 13 where the cover type and age class distribution of the forest are illustrated. Over 1,100 ha of forest are aged greater than 120 years old and almost 40,000 ha of the District is comprised of ecosites that are a combination of coniferous species.

⁴⁴ Mossler, Lynds & Major from <http://cfs.nrcan.gc.ca/index/oldgrowthforests>



Description of Cover Types
BF (balsam fir): ≥ 80 percent fir
HE (eastern hemlock): ≥ 80 percent hemlock
HS (hardwood dominated mixedwood): hardwood species > 50 percent and < 70 percent
HW (hardwood): > 80 percent hardwood
LS (low stocking)
OP (Opening): recent harvest with little regeneration
Other: roads, landings, gravel pits
PI (Pine): ≥ 80 percent pine
SH (softwood dominated mixedwood): softwood species ≥ 50 percent and ≤ 70 percent
SP (spruce): ≥ 80 percent spruce
SW (softwood): ≥ 80 percent softwood species
Wetland: land commonly referred to as a marsh, swamp, fen, or bog that either periodically or permanently has a water table at, near, or above the land's surface or that is saturated with water and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions

Figure 12. Cover type distribution in Medway District

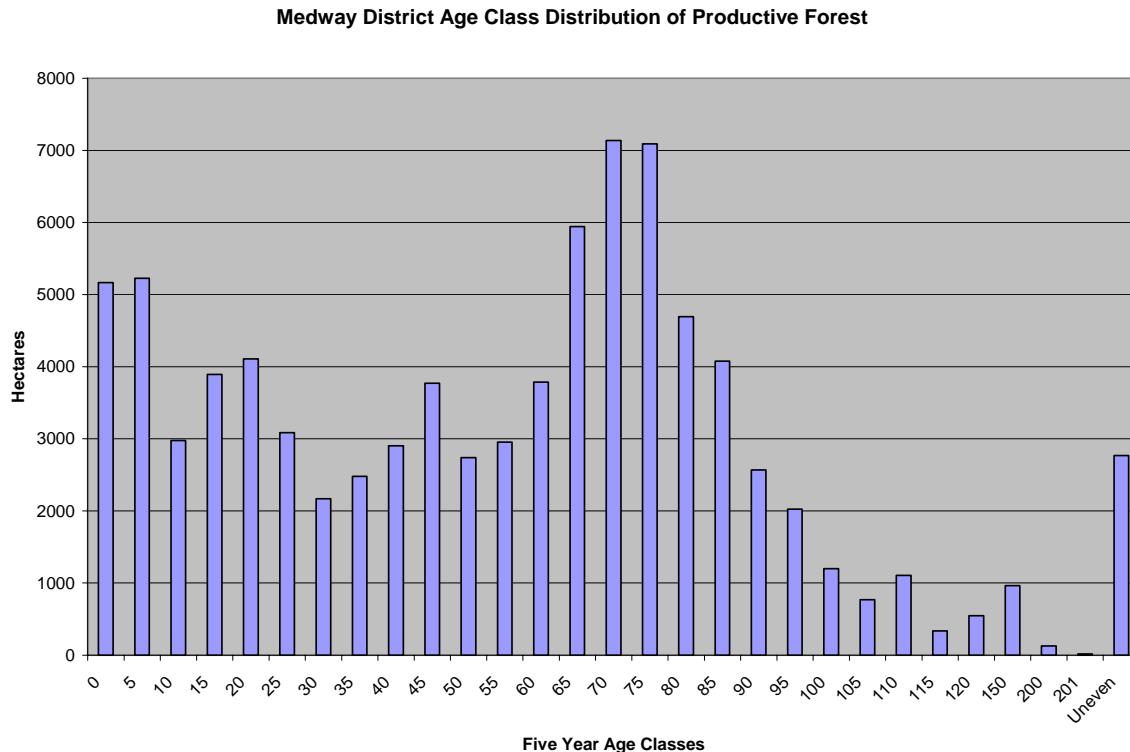


Figure 13. Age class distribution in Medway District

The use of the Nova Scotia Environment's significant, old, or unique forest database has not proved as useful as current Company land inventory. This database has been checked on the ground and through aerial photos numerous times and recent photo-interpreted forest resource inventories (FRI) have shown to be a more adequate predictor of old, unique forest. Hence, the Company prefers to rely on the most current FRI (2007).

The Company recently participated in an old growth research project through Dalhousie University, which has just concluded (Duinker and Bush 2009). Much work was done to derive a more comprehensive definition of old growth and how to create these conditions through silvicultural intervention. The result was the determination that old growth is a continuum over a spectrum of old growthness and the classical values of old growth as stated above remain applicable.

As discussed in Question 1, the Company has adopted a LEMZ approach to guide the intensity of forest interventions in Medway. Lands in Medway were assigned to a zone of old growth, low impact, intensive, or extensive (Figure 3). LEMZ is designed to facilitate connectivity between Kejimikujik National Park to the southwest of Medway and Cloud Lake Wilderness to the northeast and offer core areas of old growth forest within.

The Annapolis Field Naturalists (2009) identified a bear bathing hole west of Morehouse Lake bordering the Tobeatic Wilderness Area and a planned variable retention harvest on Company land. The Field Naturalists expressed concern over the historic use of the bathing hole by bears and in addition, bears feeding on acorns dropped from oak on hardwood ridges in the area.

High Conservation Value Identified

The old growth and low impact zones within LEMZ are designated HCVF. All forest stands where climax species comprise ≥ 30 percent of the forest stand and are greater than 120 years old are designated HCVF. This includes the Medway Lake Unique Area.

Bathing holes used by bears in the Morehouse and Fairbanks Lakes areas are designated as HCV.

Management Strategy

As a result of LEMZ, 9,590 ha of land in Medway (10 percent) was assigned to either the old growth zone (1773 ha) with no planned intervention or the low impact zone (7817 ha) where a partial harvest prescription will result in continuous forest cover while minimizing fragmentation and opening size.

The Company has also committed to increasing the percentage of multi-aged stands with late seral species through increasing the use of partial harvesting to greater than 50 percent of the area harvested in Medway District in the next five years. This objective in Medway District will increase, over time, the number of stands that are multi-aged and are largely comprised of eastern hemlock, white pine, red spruce, yellow birch, and sugar maple.

Company field staff will continue to alert planning staff of stands that are suspected to be greater than 120 years old and comprised of climax species. Potential old growth forest identified from the FRI, timber cruise data, or reports from staff, contractors, or the public will be assessed using the NS DNR assessment protocol and a management strategy determined based on the old growth values present.

The bear bathing hole west of Morehouse Lake will be surveyed for and addressed in future operating plans. Hardwood ridges near Morehouse, Fairbanks, and Mulgrave Lakes comprised predominantly of oak will have a silvicultural objective to maintain the oak component in the forest stand.

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?

Two processes (A&B) of ecosystem representation in protected areas were undertaken. The first evaluation (KBM 2009) compared the representation of ecosections (Nova Scotia provincial ecological land classification [ELC]) found in Medway to nearby protected areas (Tobeatic Wilderness Area, Kejimikujik National Park, and Cloud Lake Wilderness Area). The second process was a provincial identification of large roadless patches, areas representative of the provinces' ecosystems, and concentrations of rare ecological features (Colin Stewart Forest Forum Steering Committee 2009).

A) The Nova Scotia ELC was analysed to determine ecosection representation in the Tobeatic Wilderness Area, Kejimikujik National Park, and Cloud Lake Wilderness Area. The ecosection unit is characterized by a repeating pattern of landform/topography, soils, and vegetation throughout an ecodistrict.⁴⁵ A maximum of 63 combinations of the physical attributes is possible. The ecosection layer (1:50,000 scale) was used because it is the finest scale available provincially in terms of ELC at this time. The ecosite layer (1:10,000 scale) is currently under development and should be used in the future to help refine this analysis (KBM 2009).

⁴⁵ <http://www.gov.ns.ca/natr/FORESTRY/ecosystem/pdf/ELCRevised2.pdf>

Analysis of the ecosections within the Medway forest relative to ecosections within the three adjacent protected areas revealed that 11 of 13 ecosections (exceptions – WCDM and WFKK) found within Medway are adequately represented in the protected areas (Figure 14) (KBM 2009).

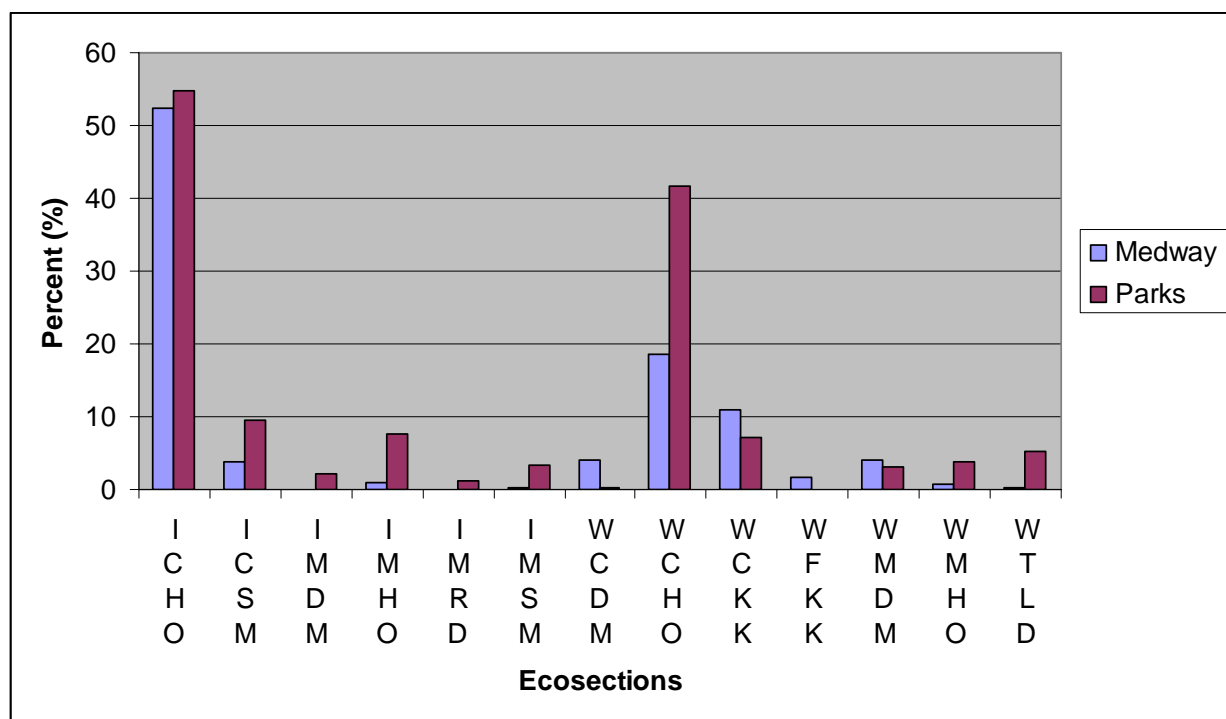


Figure 14. A comparison of ecosection distribution (percent of area) within the Medway forest versus adjacent protected areas

Ecosection WCDM is found in the South Mountain ecodistrict and represents well-drained, coarse-textured soil on drumlins or flutes. Ecosection WFKK is well-drained, fine-textured soil on hilly terrain found in the Valley Slope ecodistrict. The occurrence of drumlins and hilly terrain is low in the South Mountain ecodistrict and found largely within Medway (Neily 2009).

B) In 2005 a memorandum of understanding was signed between four Nova Scotia forest industrial companies (including Bowater Mersey Paper Company Limited) and two non-governmental environment organizations to develop a plan to complete the provincial protected areas network and simultaneously mitigating wood supply and cost impacts for the forest industry. The provincial government agreed to assist the effort with Nova Scotia Environment Protected Areas Branch and NS DNR personnel and resources. Phase 1 of the process, referred to as the CSFF, has concluded and a final submission was recently delivered to the Ministers of Environment and Natural Resources (Colin Stewart Forest Forum Steering Committee 2009).

Through the work of a CSFF Subcommittee, areas were identified from the provincial landbase for protection consideration based on the following priorities: 1) large, intact natural areas, 2) large representative areas, and 3) natural areas containing special elements, such as old forests, rare species, and rare or unusual ecosystems (Colin Stewart Forest Forum Steering Committee 2009). Medway contains 7,980 ha of land identified as important for completion of the protected areas network in Nova Scotia that have been included in the recommendation to the Government of Nova Scotia (Figure 15).

High Conservation Value Identified

A) Medway contains 3,935 ha of ecosection WCDM; 331 ha of WCDM were identified in adjacent protected areas. WFKK is found on 1,590 ha in Medway and 78 ha occur in Cloud Lake Wilderness Area. The ecosections themselves have no specific structural HCV or soil profile that is necessarily unique in Nova Scotia; however, WCDM and WFKK are identified as HCV in Medway based solely on the ecosystem representation analysis.

B) As a result of the identification of areas important to complete the protected areas network in Nova Scotia by the CSFF, the Company has declared a moratorium on timber-harvesting and road-building activities on all but a few parcels of these lands until December 31, 2010 (Figure 15). This decision has been accepted by the CSFF signatories. Hence, all areas included as “Yes” in Figure 15 are identified as HCV.

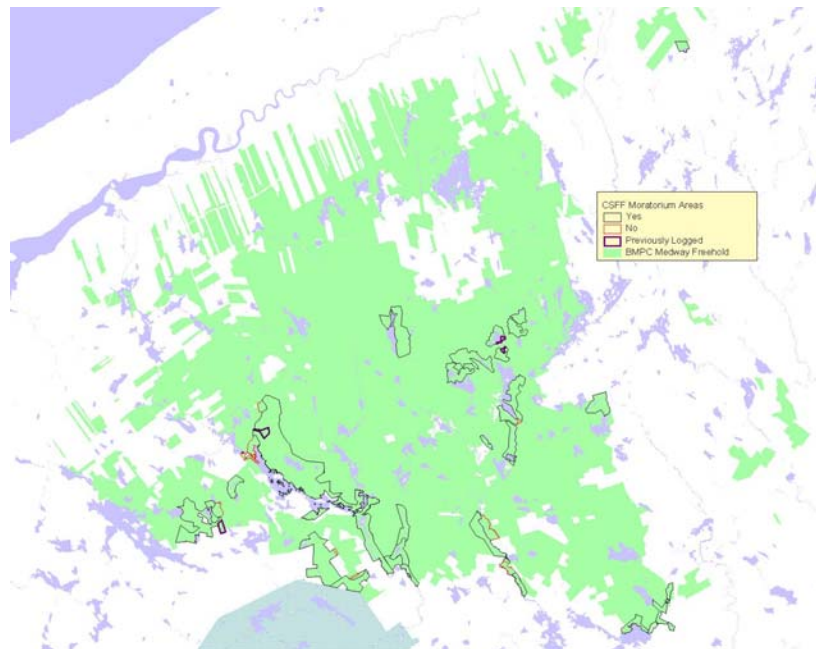


Figure 15. The CSFF areas in Medway included in the recommendation to the Crown; of note are a few parcels (92.5 ha) where trees have already been harvested and 443.5 ha that were not included in the moratorium but were included in the final submission to the Crown

Management Strategy

A) Locations of ecosection WCDM in Medway contributed to delineation decisions of the old growth and low impact zones (LEMZ). The old growth zone incorporates 367 ha of WCDM and low impact, 802 ha. No management intervention will be prescribed in the old growth zone and only partial harvest prescriptions (less than 50 percent removal) will be assigned to the low impact zone. Thus, at least 30 percent ($367+802 / 3935$) of ecosection WCDM will be undisturbed or subject only to partial harvesting. If WCDM in protected areas is included, at least 38 percent of the ecosection is afforded special consideration within the ecodistrict.

Found in the Valley Slope Ecodistrict, ecosection WFKK comprises 1,590 ha of Medway and occupies 27,849 total hectares in the ecodistrict. Medway contains only 13 percent of the ecosection found in the entire ecodistrict and 78 ha of WFKK are found in Cloud Lake Wilderness Area. Given the small representation of WFKK in Medway, further investigation will be conducted to determine the uniqueness of vegetation in ecosection WFKK in Medway District. Depending on site conditions and species present, partial harvest prescriptions may be assigned in future to WFKK ecosections found in Medway.

B) Lands identified by the CSFF, accepted by the Company, and placed under moratorium until December 31, 2010, will not be operated in. Beyond this date, the Company will assess lands included in the harvesting and road building deferral and consider extension of the moratorium if sufficient mitigation measures can be implemented. Decisions on moratorium parcels after December 31, 2010, will be made outside the current CSFF memorandum of understanding and re-evaluated in the HCVF assessment.

11. Are large landscape level forests (i.e., large unfragmented 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 even greater resolutions.

A recent determination of the extent of human footprint in Medway 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 16). Medway remains sparsely populated and is projected to become even less populated in future (Trombulak et al. 2008).

According to the Global Forest Watch intact forest analysis for Canada, Nova Scotia currently retains very few large, intact forest areas (Figure 17). Medway District is not captured in the intact forest analysis. Southwest of Medway, 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.

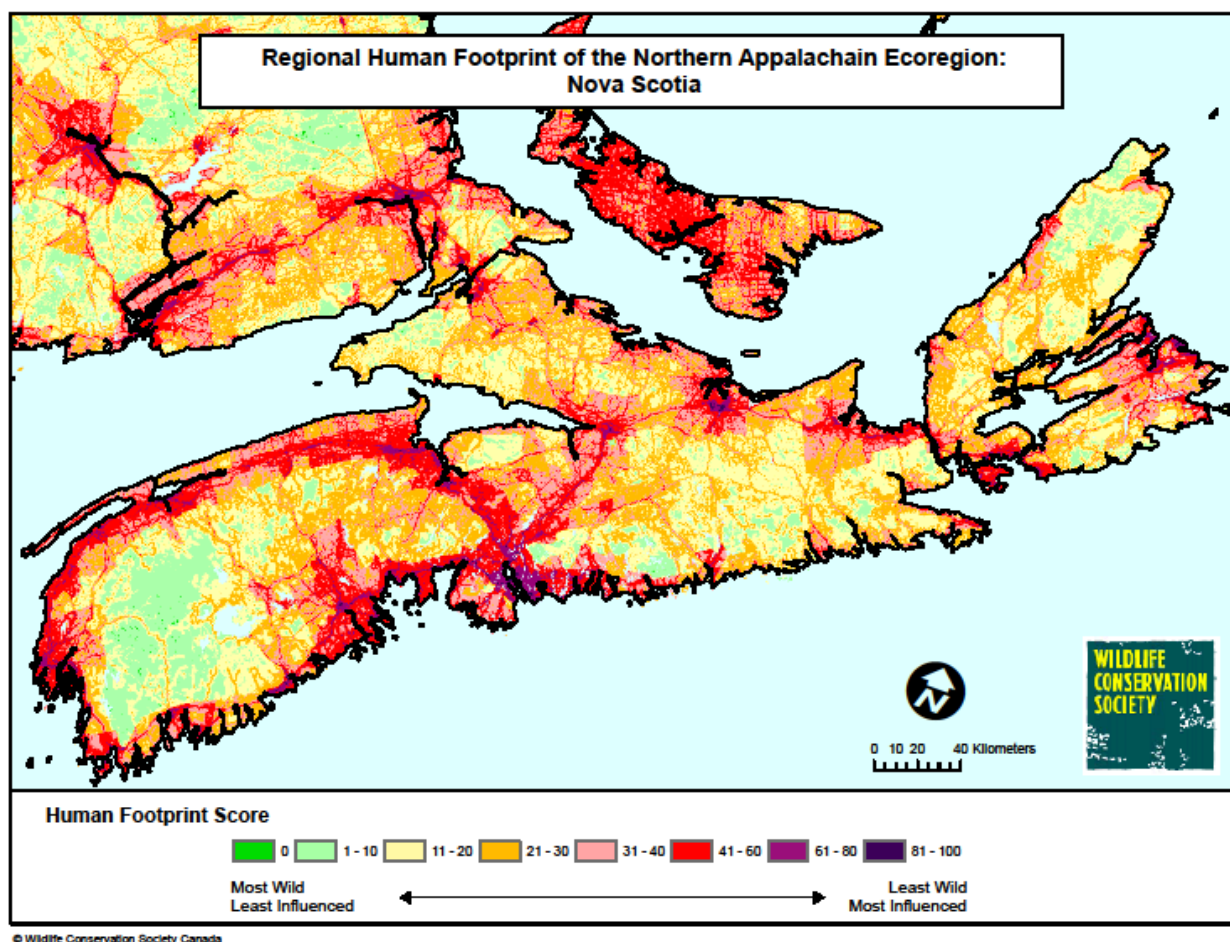


Figure 16. Human footprint extent in Nova Scotia as calculated by the Wildlife Conservation Society⁴⁶

A more regional analysis of large landscape level forests was conducted by the CSFF (Colin Stewart Forest Forum Steering Committee 2009) in Nova Scotia. As discussed in Question 10, this process included investigation of large roadless patches. The process identified only one patch greater than 2,000 ha (Figure 17) with a number of patches hundreds of hectares in size.

High Conservation Value Identified

If we accept the definition of large landscape level forest at $\geq 10,000$ ha, then neither the Global Forest Watch nor CSFF analyses result in identification of large landscape-level forests. However, as recognized in Question 10, most patches identified by the CSFF are designated HCV.

⁴⁶ Two Countries, One Forest at http://programs.wcs.org/portals/42/media/file/NApps_HF.jpg

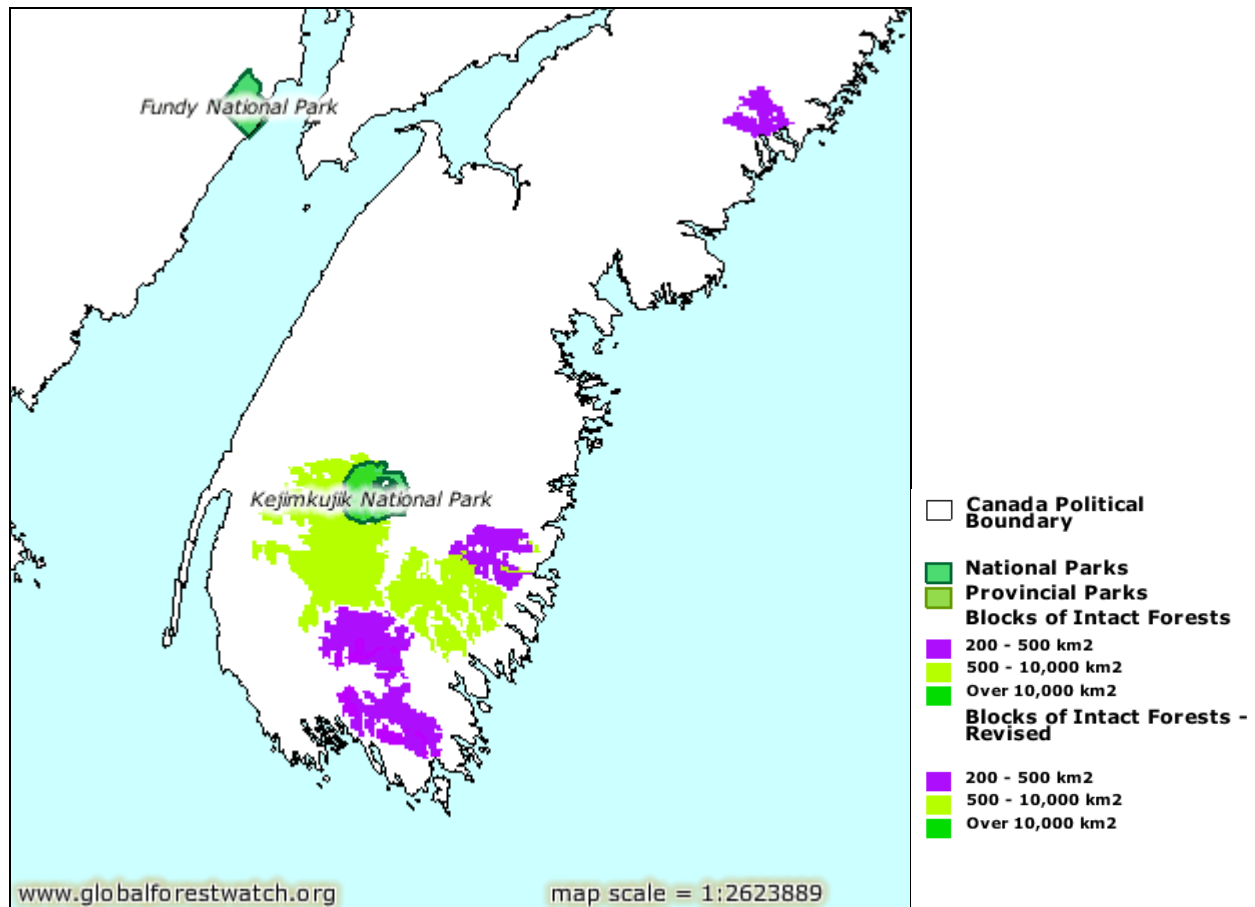


Figure 17. Large intact forest area in southwestern Nova Scotia⁴⁷

Management Strategy

None required; however, Question 10 addresses the management strategy for patches identified by the CSFF.

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

In 1994 the Company developed its Unique Areas Program. The Program provides guidelines for the conservation of natural areas with significant and unique botanical, zoological, geological, hydrological, cultural, or scenic characteristics. Depending on the particular characteristics of an area, it can be designated as a Protection Area, Conservation Area, or Forest Recreation Area. Both Protection and Conservation Areas are excluded from forest management interventions with the exception of forest protection activities. Several areas were identified under this Program, and in 2007 a number of these were sold to the Province of Nova Scotia. These areas are described in the following tables.

Areas transferred to the Province of Nova Scotia are described below (Table 4).

⁴⁷ Global Forest Watch at <http://www.globalforestwatch.org/english/interactive.maps/canada.htm>

Table 4
UNIQUE AREAS AND POCKET WILDERNESSES THAT ARE NOW OWNED BY THE
PROVINCE OF NOVA SCOTIA

Area Name	Size	Location	Description
Lamb's Lake	164 ha	Annapolis County	Large and old deciduous stand composed primarily of sugar maple, yellow birch, and American beech. Also contains unusual flora and undisturbed lakeshore.
McGowan Lake	102 ha	Queens County	Habitat for the endangered Blanding's turtle.
Roxbury	21 ha	Annapolis County	A long abandoned settlement that thrived in the mid-1880s. The site contains the foundations of several barns, houses, sheds, a church, two graveyards, old wells, a rock dam, and a mill pond.
Mickey Hill Pocket Wilderness	14 ha	Annapolis County	A 1.5-kilometre walking trail along the historic Allain River and a trail to the popular sandy beach on Lamb's Lake.

Areas maintained by Bowater Mersey Paper Limited within the Medway Forest include those described in the following table (Table 5). For the latter of these areas, Bowater Mersey Paper Company Limited has entered into a management partnership with a local organization interested in this unique site.

Table 5
UNIQUE AREAS OWNED BY BOWATER MERSEY

Area Name and Designation	Size	Location	Partners in Conservation	Description
<i>Conservation Areas</i>				
Medway Lake	45 ha	Annapolis County	n/a	Trees are exceptionally large. Hemlock and spruce 225 years old and understory composed of climax ground vegetation.
<i>Protection Areas</i>				
Lohnes Lake Historical Site	3 ha	Annapolis County	Royal Canadian Legion	Crash site of a WWII mosquito fighter plane.

As noted in Question 1, a single record of Atlantic salmon exists from the Round Hill River 200 m from Medway past the confluence of the East and West Branches of the Round Hill River flowing out of the District. 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. Atlantic salmon are not able to reach Medway from the south (Mersey or Medway watersheds) because of the presence of Nova Scotia Power dams preventing fish passage.

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 the Company signed an agreement with the Province of Nova Scotia to protect wetlands on Company land. This agreement, termed the Eastern Habitat Joint Venture, sought to 1) “maintain the existing wetlands base on Bowater properties,” and 2) “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 Medway in 1993 (Nova Scotia Eastern Habitat Joint Venture Stewardship Project 1993). This document recommends a number of general guidelines for wetlands in Medway designed to minimize loss of wetland function. These guidelines apply to all wetlands within Medway and include: 1) designation of special management zones (20 m) for all wetlands adjacent to a watercourse that are identifiable on 1:50,000 topographic maps; 2) prohibition of heavy equipment within 30 m of a watercourse; 3) permission to conduct selection harvesting up to 40 percent removal in SMZ; and 4) construction of roads according to government standards.

High Conservation Value Identified

All sites designated as Unique Areas in Medway District are HCV. No new HCV is necessary for Atlantic salmon in Question 12. Refer to Question 1 for HCV designated for Atlantic salmon. Question 12 designates no new HCVs for Brook trout. Refer to Question 3 for designation. All wetlands in Medway identifiable on a 1:50,000 topographic map and any included in the NS DNR wetland data base (4,885 ha) are designated HCV.

Management Strategy

No forest management operations are permitted within Unique Areas in Medway District while the unique feature exists. If forest protection is necessary, plans will be developed and implemented to preserve the value of the Unique Area.

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

No forest operations will be conducted in bogs, marshes, fens, and meadows. All wetlands that contain open water will be buffered with a SMZ (20- to 30-m no harvest zone).

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 forest contributes ecological services for water quality as it contains headwater streams for the Mersey, Medway, Sissiboo, and Annapolis Rivers (Figure 18). Although none of the Medway forest has been designated as an official drinking water source (Figure 19), it nonetheless plays an important hydrological role. The Medway forest 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 forest, the Annapolis and Mersey Rivers have been subjected to long-term monitoring. Since 1992 Clean Annapolis River Project group has been monitoring water quality parameters of 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 temperature have been observed (Glenen and Sharpe 2009). 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 change in land-use on water quality.

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 to climatic change, there is reason to believe that the increased flash flow events could be related to land use change 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 included at least 20-m buffers 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), which is located east of the Medway forest. The results of this research indicate that the impact of forest harvesting on surface water quality included slight water table and discharge peak increases during the first year after harvesting. Beyond this, the impact of the studied forest cover changes on water quality was negligible.

The study results suggest that the most important feature to consider 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 their waters are more susceptible to heating influence from sunlight exposure prior to entering the main channel. As well, they suggest that watersheds that are fed from ground water rather than surface water are more resilient to land use change (Pockwock Bowater Watershed Project 2005).

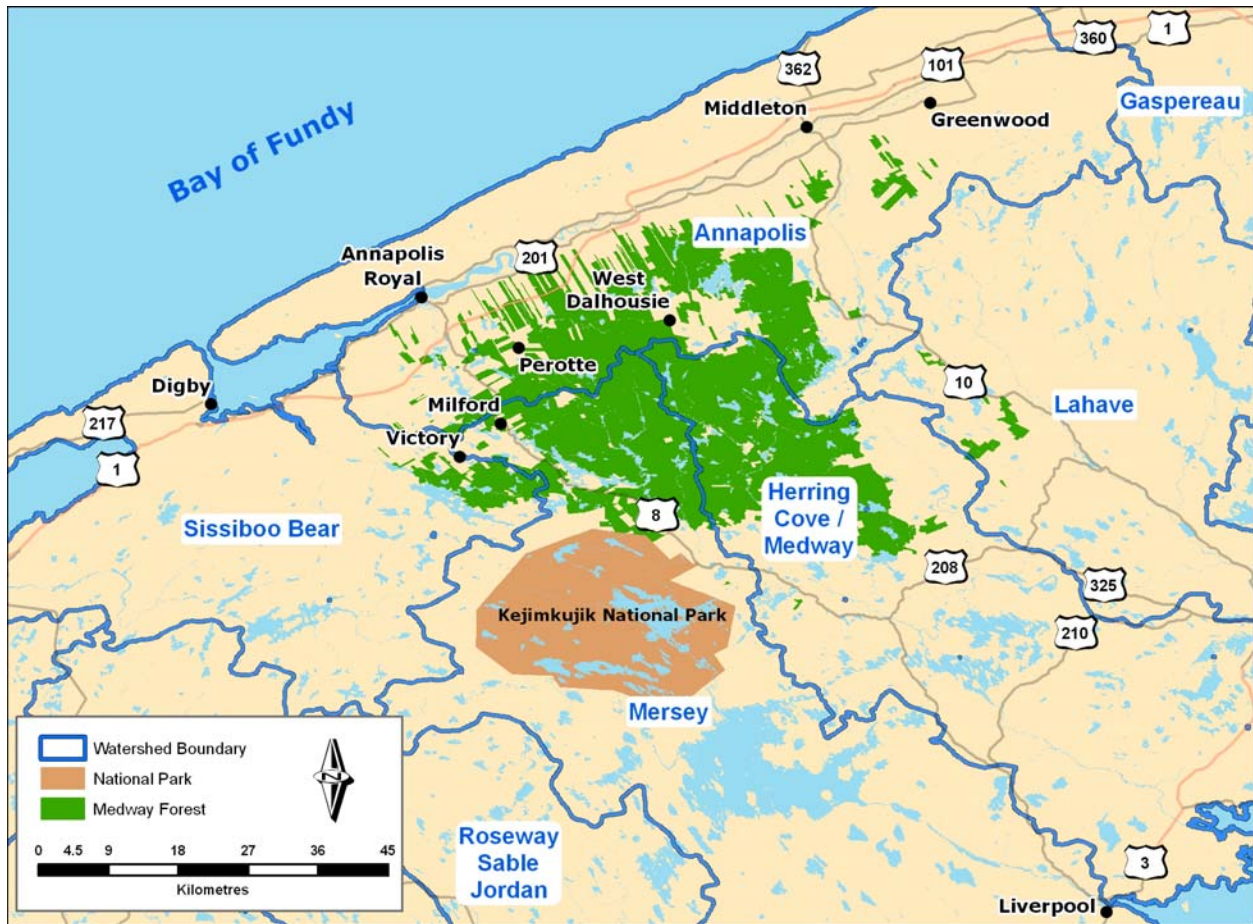


Figure 18. Watersheds of southwestern Nova Scotia
(Nova Scotia Environment)⁴⁸

⁴⁸ Nova Scotia Environment at http://gov.ns.ca/nse/water/docs/WaterStrategy_NSWatershedMap.pdf

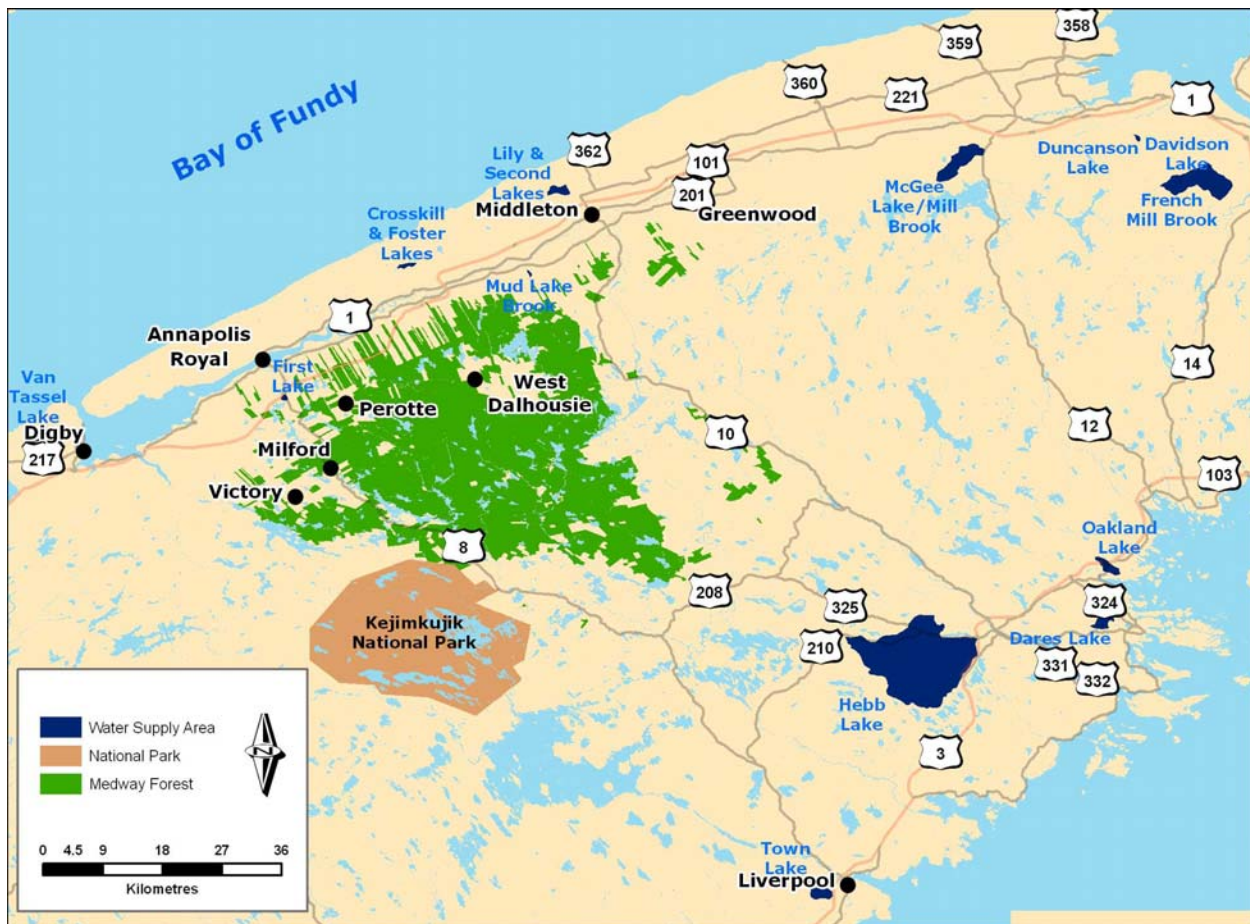


Figure 19. Water supply areas for the area surrounding the Medway forest lands (KBM 2009)

The Medway forest 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 20). 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 forest with respect to the Group's mandate.

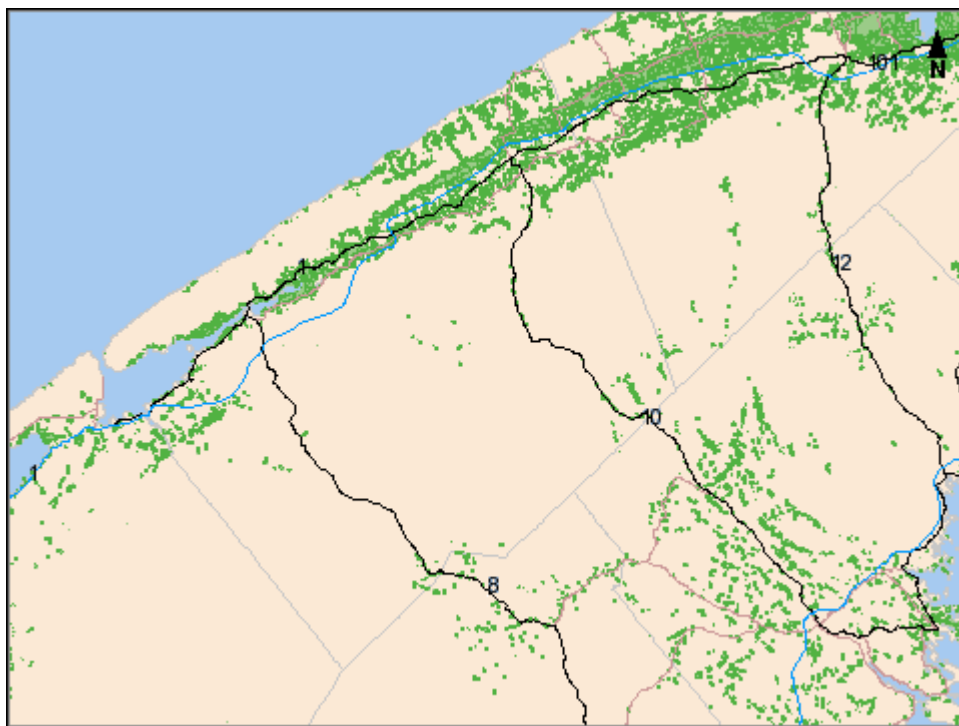


Figure 20. Agricultural areas surrounding the Medway forest lands (shown in green)⁴⁹

High Conservation Value Identified

None of the above evidence suggests that rivers and streams are significantly negatively affected by forest management activities. However, provincial regulations (Wildlife Habitat and Watercourse Protection Regulations 2002) require SMZs on all watercourses greater than 50 cm with the objective to protect these watercourses from sedimentation and increases in temperature. The Company recognizes this objective and therefore designates SMZs (20- to 30-m no harvest) as HCV.

Management Strategy

The Company continues to recognize the value of water quality through the designation of SMZs, which exceed in some areas exceed the provincial regulations by 10 m. 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 SMZ or machine-free zone (MFZ). 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.

⁴⁹ Atlas of Nova Scotia at http://www.gov.ns.ca/geonova/home/products/softpage/ns_atlas.asp

The locations of new roads, culverts, and bridges are planned using the depth-to-water table 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 forest is situated within various watersheds as shown in Figure 19. The most significant landscape feature that mediates flooding is the presence and function of wetlands as their hydrological role is vital in controlling water flow. The Medway forest contains approximately 8,500 ha of wetlands (see Table 6) that are dispersed throughout the District. Together these landscape features maintain and control water flow.

Table 6
WETLAND TYPES WITHIN THE MEDWAY FOREST

Wetlands	Area (ha)
Deep Marsh	67
Seasonally Flooded Flats	44
Flowage	264
Lakeshore Wetland	299
Meadow	23
Shrub Bog	1,614
Shrub Fen	1,800
Shallow Marsh	20
Shrub Swamp	570
Treed Bog	3,653
Treed Fen	133
Total	8,487

High Conservation Value Identified

All of these landscape features that contribute to maintaining and controlling water flow will be considered HCVs.

Management Strategy

Although all of these features are considered HCVs, their management strategies are not all similar. Management strategy options for these features frequently include establishing a SMZs (20- to 30-m no harvest) as indicated in Table 7. However, any of these wetlands that contain open water or a known provincially or federally listed species will be assigned a SMZs (20- to 30-m no harvest).

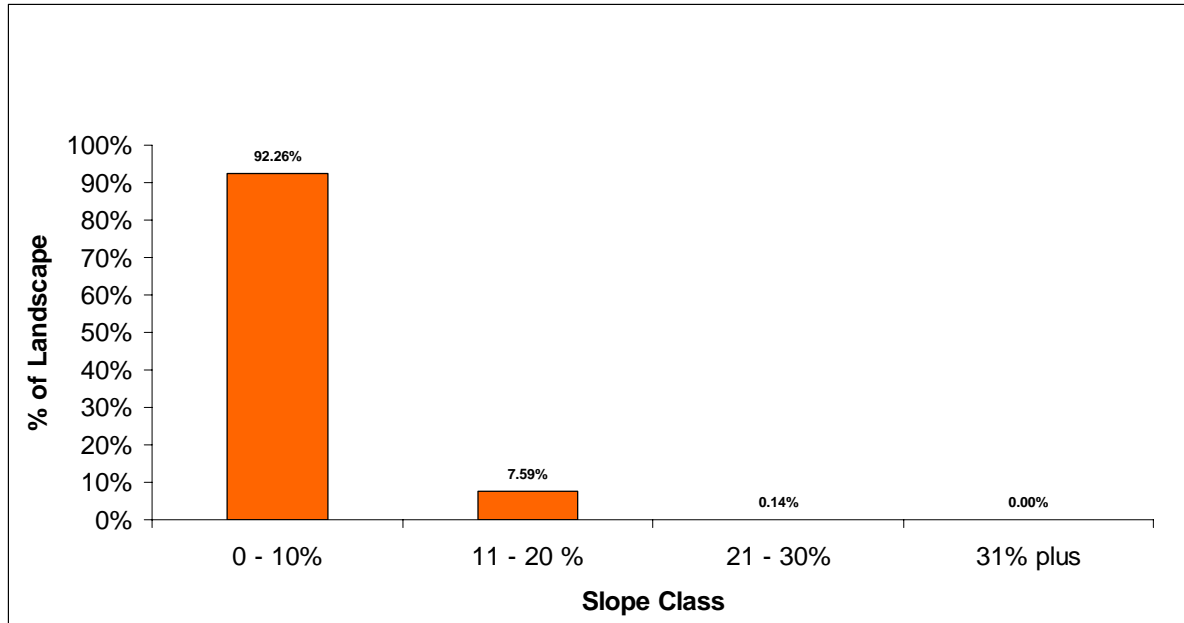
Table 7
MANAGEMENT STRATEGY ASSOCIATED WITH EACH TYPE OF WETLAND

Wetlands	Management Strategy
Deep Marsh	SMZs (20- to 30-m no harvest)
Seasonally Flooded Flats	SMZs (20- to 30-m no harvest)
Flowage	SMZs (20- to 30-m no harvest)
Lakeshore Wetland	SMZs (20- to 30-m no harvest)
Meadow	SMZs (20-to 30-m no harvest)
Shrub Bog	No SMZ assigned
Shrub Fen	SMZs (20-to 30-m no harvest)
Shallow Marsh	SMZs (20-to 30-m no harvest)
Shrub Swamp	No SMZ assigned
Treed Bog	No SMZ assigned
Treed Fen	SMZs (20-to 30-m no harvest)

15. Are there forests critical to erosion control?

Slope and soil characteristics are key contributors to risk of soil erosion. Soil erosion results in loss of productive land and can lead to sedimentation in watercourses. According to the provincial Wildlife Habitat and Watercourse Protection Regulations, SMZs are established along watercourses and more specifically are increased along watercourses with greater riparian zone slope. A SMZ along a watercourse needs to be increased by 1 m for every 2 percent increase in slope above 20 percent to a maximum of 60 m to reduce risk of soil erosion. This infers that 20 percent is an accepted threshold for considering additional management to reduce the risk of soil erosion.

The results of a digital elevation model for Medway District showed that only 0.14 percent has a slope class greater than 20 percent (Figure 21) (KBM 2009). This analysis determined that roughly 93 percent of the Medway District is within the 0 to 10 percent slope class, and only 7 percent is in a slope class greater than 11 percent. The soil of the Medway District is comprised of dominantly Gibraltar soils, which are coarse-textured and do not contribute to excessive erosion. Therefore, both the topography and parent material of the Medway District do not create conditions for significant soil erosion.



**Figure 21. Slope class distribution on the Medway District
(Digital elevation model [KBM 2009])**

High Conservation Value Identified

There are no HCVs identified under this question.

Management Strategy

None required.

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?

The WWF-Canada (2005) suggested considering two general areas to identify potential HCVFs related to this question since the issue of fire barriers or interface forests was originally identified for tropical forests. It suggested considering whether the trend in fire disturbance is within its natural range and spatially assessing fire risk and suppression to develop understanding of natural fire cycles.

Understanding the natural disturbance patterns in the Acadian forest prior to European settlement continues to be a subject of debate (Bowater Mersey Paper Company Limited 2009). Hurricanes, fire, insect outbreaks, and individual tree senescence are all sources of natural disturbance that shaped and continue to shape the Acadian forest. The NS DNR (Neily et al. 2007) presents an interpretation of the historical disturbance forces that shape the forest landscape that are mapped as either frequent⁵⁰,

⁵⁰ Frequent being stand initiating events shorter than the longevity of the climax species that results in a more even-aged forest

infrequent⁵¹, gap⁵², or open seral.⁵³ 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 ecoregions across the province. This information provides a guide for land managers to establish landscape level goals with which to manage the landscape.

Analysis has been completed for the Medway District and the results indicate there is a need to increase the amount of late-seral, multi-aged forests within the South Mountain Ecodistrict. This demonstrates a variety of natural disturbances would occur that include stand-replacing events, such as fire and small gap disturbances. A strategy to increase late-seral, multi-aged forests has been incorporated into the management plan and the long-term forecast indicates there will be an increase in late-seral, multi-age forest through the increase of partial harvest systems and silviculture (Bowater Mersey Paper Company Limited 2009).

To further develop late-seral forests characteristics throughout the landscape stand level features, such as wildlife clumps, snags, and cavity trees, will be left on-site after harvest to provide residual vertical structure. These structural elements have been documented to remain following fire disturbance (McRae et al. 2001) and contribute to provide ecological services throughout the development of the stand.

The NS DNR provides an indication of the inherent vulnerability of these ecosystems, but due to a long history of land use in the province, the current forest conditions may have changed its vulnerability to fire (Stewart 2009). The NS DNR Wildfire Management group 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.⁵⁴ 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

The Company maintains emergency response procedures for forest fire protection and response through training and on-site audits.

⁵¹ 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

⁵² Gap – small scale, continuous, incremental disturbances that results in a more uneven-aged forest landscapes enduring features

⁵³ Open seral – where site conditions restrict or limit tree growth creating sparse or non-existent forest cover

⁵⁴ 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 traditional economic uses of the southwestern region of Nova Scotia include forestry, mixed agriculture, near-shore coastal fisheries, professional backcountry guiding for recreational angling and hunting, as well as mineral prospecting and mining⁵⁵ (KBM 2009). As well, the interest in the development of non-timber forest products continues to grow and is supported by government programs (Lavers and Staicer 2009).

The Medway District is located in an area of low human population density (Figure 22). The area covered by the Medway District is of very low density (0-4 people per square kilometre), and adjacent populated areas (i.e., Annapolis Valley) also have relatively low population density (KBM 2009). However, 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 canoeing, kayaking, and angling.

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, the recreational use and enjoyment of the Medway forest 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 various roadways and popular canoe routes, canoe portage trails, boat entry points, and campsites to maintain the integrity of the view of the woodlands.

⁵⁵ Southwest Nova, described by UNESCO, available August 2008; www.unesco.org/mabdb/br/brdir/directory/

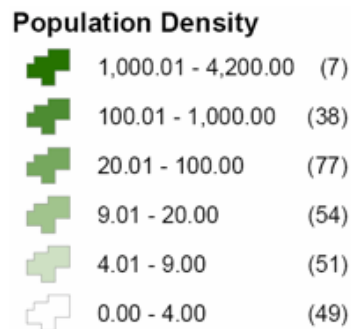
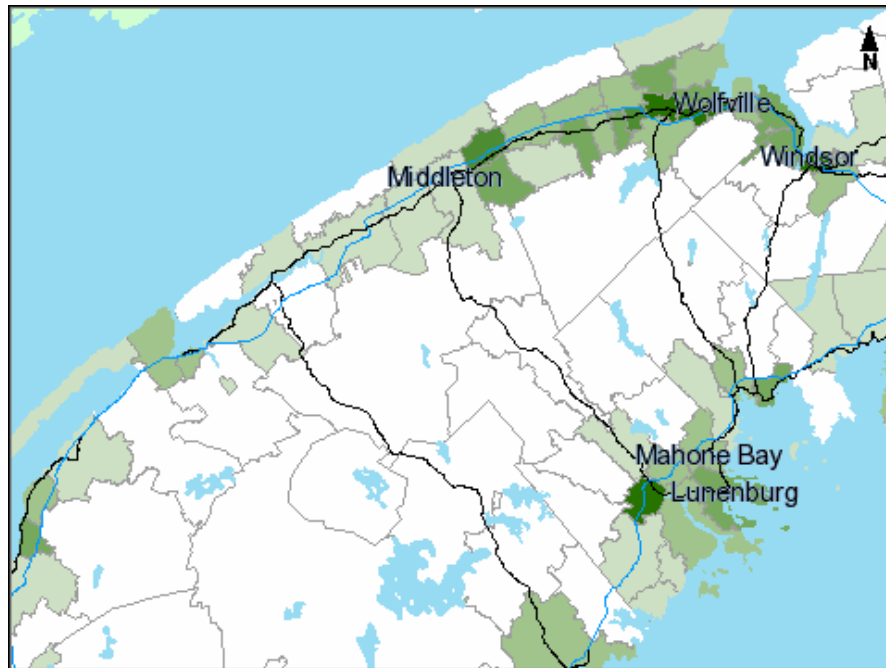


Figure 22. Population density for the area surrounding the Medway forest lands (number of people per km²)⁵⁶

Management Strategy

To protect views along major roadways the Company has established a SMZ (30-m no harvest) along all 10- and 100-series highways and many scenic routes adjacent to the Medway District (Highways 1, 8, 10, and 101). The integrity of views along frequently visited canoe routes is considered during a pre-harvest assessment by designing variable buffer widths to minimize the visual impacts of timber harvesting. All known canoe portages and boating entry points are stored in the GIS, identified on the pre-harvest assessment, and flagged in the field to notify harvesting operators to keep trails free of brush and ensure they are passable (Figure 23).

⁵⁶ Atlas of Nova Scotia at http://www.gov.ns.ca/geonova/home/products/softpage/ns_atlas.asp

Other benefits of the Medway District that have not been identified as HCVs but are important to the local community include the availability of recreational opportunities through ungated sections of the Medway forest. This ungated area of the Medway District provides vehicle access for hikers, walkers, anglers, etc., to access forest land for their recreational needs.

All of the Medway District is available for activities, such as hunting and fishing. However, legal access is limited to either foot or bicycle travel. The road network in the Medway District is occasionally permitted to sanctioned all-terrain vehicle clubs for their recreational purposes.

Annual public open houses and work with the Forest Advisory Committee 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 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.

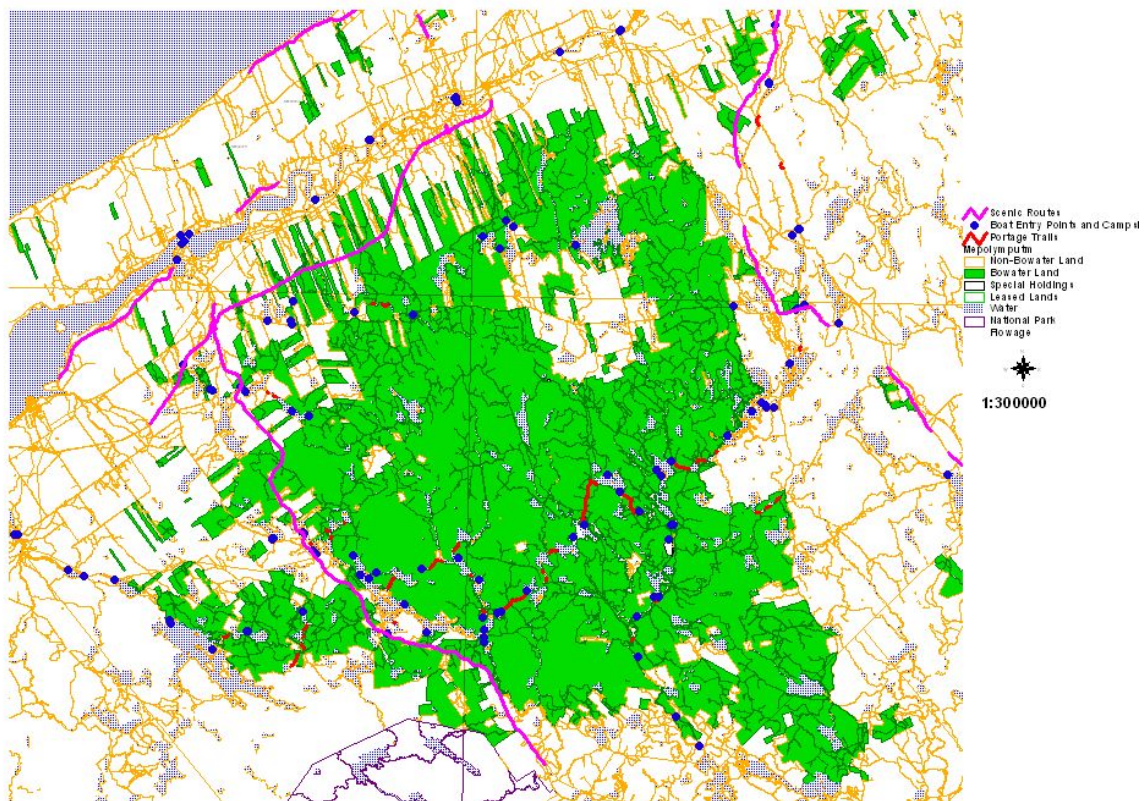


Figure 23. Locations of scenic routes, portage trails, and boat entry points identified within the Medway District

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?

There are two Aboriginal First Nations communities near the Medway District. The Bear River First Nation is based in the community of Bear River (population 278), northwest of the Medway area. The Annapolis Valley First Nation is located northeast of the Medway District and has a population of 233 people. 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 24.



Figure 24. Location of Aboriginal communities in Nova Scotia⁵⁷

⁵⁷ Nova Scotia Office of Aboriginal Affairs at <http://gov.ns.ca/abor/aboriginalpeopleinns/communityinfo>

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, as well as smaller animals. Berries, roots, and edible plants were gathered during the summer.⁵⁸

Archeological research was conducted by Pentz (2008) along the upper Mersey watershed and Allains River. His team collected local knowledge from Mi'kmaq people to identify areas along these river systems to support the idea that these river systems were ancient travel corridors that connect the Bay of Fundy with the main Atlantic Ocean. His research was built upon previous research known as the Upper Mersey/Allains River Corridor Archaeological Survey (UMARC), which was completed in 2006 (Figure 25). Through shovel tests, excavations, and observations, his research found various artifacts, traditional camp sites, and portage trails along these river systems. Table 8 identifies each site found within the Medway District, and all of these areas are considered HCVs and are stored in the GIS.

Table 8
SITE NAMES AND THEIR ASSOCIATED EVIDENCE OF SIGNIFICANT
ARCHAEOLOGICAL SITES FOUND WITHIN THE MEDWAY FOREST

Geoname	Evidence
BdDh-02-Stedman Beach	Artifacts found along lake shore
BdDh-03-Big River Runs	Modern and traditional portage and artifacts
BdDi-02-Grand Lake Stream Weir 1	Fish weir in river
BdDi-03-Grand Lake Stream Weir 2	Fish weir in river
BdDi-05-Springhill Mud Lake	Traditional campsite
BdDi-06-Boot Lake	Traditional campsite and portage trail
BdDi-07-McKibbin Beach	Artifacts found along lake shore
BdDi-08-Meuse Site	Traditional campsite
BdDi-09-Lambs Lake Brook	Artifacts found along lake shore

⁵⁸ Nova Scotia Office of Aboriginal Affairs, Aboriginal History in Nova Scotia – Nova Scotia Museum Info Sheet, available at <http://gov.ns.ca/abor/aboriginalpeopleinns/demographics>

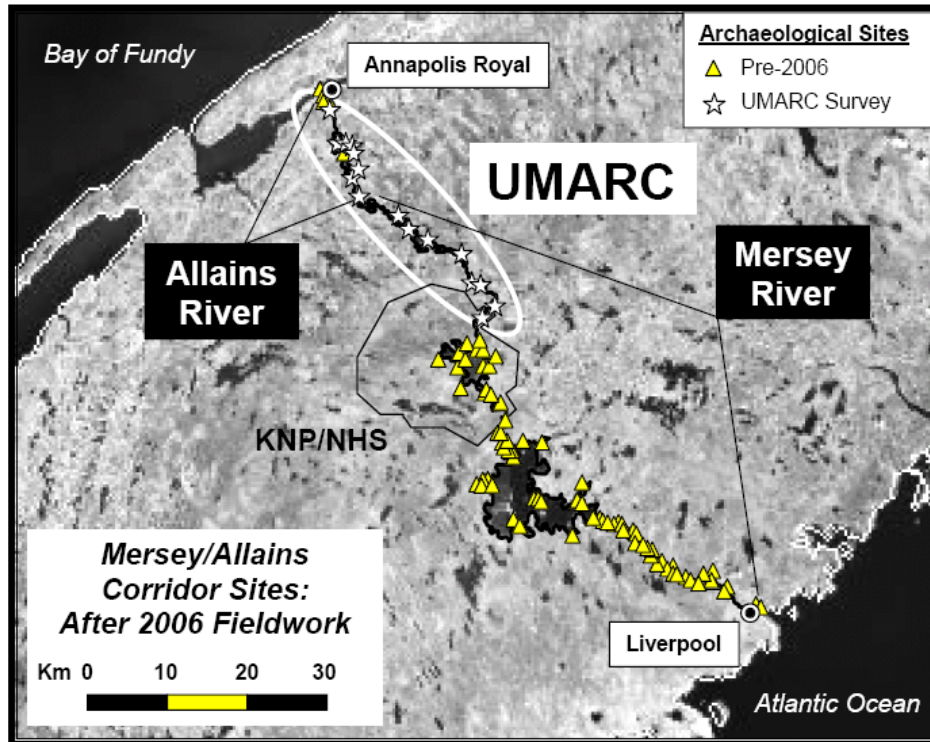


Figure 25. Locations of archaeological sites identified prior to 2006 and through UMARC surveys along the Mersey and Allains waterways (Pentz 2008)

Another area within the Medway District that is culturally significant is the Lohnes Lake memorial site. This site has been designated 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 and is identified as an HCV.

High Conservation Value Identified

All of the sites with confirmed archeological artifacts identified in Table 8 are designated HCVs.

The Lohnes Lake memorial site is identified as an HCV.

Management Strategy

Since many of the sites identified in Table 8 are located along lake shores and are located within the SMZ (20- to 30-m no harvest) they are protected from timber harvesting and road building activity. Two sites that are considered to be traditional portage trails (BdDh-03-Big River Runs and BdDi-06-Boot Lake) will receive a further protective action if harvesting operations take place near these areas. Planning staff will contact the Nova Scotia Museum to determine an appropriate SMZ that can be established to maintain the integrity of the portage trails.

Furthermore, as a result of this research (Pentz 2008) some parcels of Company land along the Mersey River (parcel 19 – Taylors Lake, parcel 20 – Fisher Lake, and parcel 22 – Medway Lake) were sold to the Province of Nova Scotia to be managed as conservation areas.

Planning staff receive an annual GIS shapefile from the Nova Scotia Museum that identifies all other known archaeological points. If forest operations are planned near one of these points, the Nova Scotia Museum is contacted to determine the appropriate SMZ.

The Company is currently in discussion with local First Nations communities and organizations to further identify areas that are culturally significant. A First Nations member participates on the Company's Forest Advisory Committee with a role to help identify other culturally significant areas and other culturally significant forest products (i.e., white birch used for canoe building, ash trees for basket weaving, etc.).

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.

LITERATURE CITED

- AC CDC. 2009. GIS digital location points of uncommon species of flora and fauna. Atlantic Canada Conservation Data Centre.
- Ackerman, G. 2007. Riparian buffers as breeding habitat for forest birds in Nova Scotia. M.Sc. Thesis. Department of Biology, Dalhousie University.
- Anderson, F. 2006. Surveys for boreal felt lichen on Bowater Mersey Woodlands 2005-2006. Survey for rare or endangered lichens for Mersey Woodlands Operations on contract stumpage land near Timber Lake, Lunenburg County, Nova Scotia, July 9, 2009.
- Altman, B., and R. Sallabanks. 2000. Olive-sided flycatcher (*Contopus cooperi*). In The Birds of North America, No. 502 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Avery, M.L. 1995. Rusty blackbird (*Euphagus carolinus*). In The Birds of North America, No. 200 (A. Poole and F. Gill, eds.). In The Academy of Natural Sciences, Philadelphia, and the American Ornithologists Union, Washington, D.C.
- Banfield, A.W.F. 1974. The Mammals of Canada. University of Toronto Press. 438 pp.
- Bowater Mersey Paper Company Limited. 2009. Management strategies for the Medway District to restore features of the Acadian Forest based on natural disturbance regimes. Bowater Mersey Paper Company Limited.
- Bowers, N., Bowers, R., and K. Kaufman. 2004. Mammals of North America. Published by HMCo Field Guides.
- Burns, R.M. and B.H. Honkala. 1990. Silvics of North America. Vol. 1 Conifers. USDA Forest Service Agriculture Handbook 654, Washington, D.C.
- Cink, C. L., and C. T. Collins. 2002. Chimney swift (*Chaetura pelagica*). In The Birds of North America, No. 646 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Colin Stewart Forest Forum Steering Committee. 2009. Colin Stewart forest forum final report. November 2009.
- Conway, C. J. 1999. Canada warbler (*Wilsonia Canadensis*). In The Birds of North America, No. 421 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Corbett, G.N., Baird, W.R., and D.B. Potter. 2009. Seasonal movement, habitat use and growth rates of brook trout in the Upper Mersey River watershed, Nova Scotia. Trout Research Associates.
- COSEWIC. 2005. COSEWIC assessment and status report on the prototype quillwort *Isoetes prototypus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 31 pp.
- COSEWIC. 2006a. COSEWIC assessment and update status report on the Atlantic salmon *Salmo salar* (Inner Bay of Fundy populations) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 45 pp.

- COSEWIC. 2006b. COSEWIC assessment and status report on the ghost antler *Pseudevernia cladonia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 29 pp.
- COSEWIC. 2007. COSEWIC assessment and update status report on the wood turtle (*Glyptemys insculpta*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 42 pp.
- Duinker, P.D. and P. Bush. 2009. Old growth forest conservation strategy for Bowater Mersey. Dalhousie University.
- EAC 2009. Comments on the “High Conservation Values Report” (April 2009) completed by KBM forestry consultants Inc. for Bowater Mersey Paper Company. Ecology Action Centre. Halifax, Nova Scotia.
- Erskine, A.J. 1992. Atlas of breeding birds of the Maritime Provinces. Government of Nova Scotia.
- Farrow, L.J. 2007. Distribution of Eastern pipistrelle (*Perimyotis subflavus*) in Southwest Nova Scotia relative to landscape factors. Master Thesis. St. Mary’s University.
- FSC-STD-CAN-Maritimes-2008. Certification standards for best forestry practices in the Maritime Region. Forest Stewardship Council Canada.
- Glenen, J. and A. Sharpe 2009. Annapolis river 2008 annual water quality monitoring report. Clean Annapolis River Project.
- KBM. 2009. Forest Stewardship Council high conservation values report for Bowater Mersey Paper Company Medway forest lands. KBM Forestry Consultants. Thunder Bay, Ont.
- Lavers, A. 2004. Spatial ecology in a northern adjunct population of southern flying squirrel, *Glaucomys volans*. Master Thesis, Acadian University.
- Lavers, A. and C. Staicer. 2009. General comments on Bowater Mersey Paper Company’s high conservation values report as written by KBM Forestry Consultants. Mersey Tobeatic Research Institute.
- Maass, W. and D. Yetman. 2002. COSEWIC assessment and status report on the boreal felt lichen (*Erioderma pedicellatum*) in Canada, in COSEWIC assessment and status report on the boreal felt lichen (*Erioderma pedicellatum*). Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1- 50 pp.
- MacGregor, M.K. and M. Elderkin, 2003. Protecting and conserving wood turtle: a stewardship plan for Nova Scotia. Nova Scotia Department of Natural Resources.
- Maritime Breeding Bird Atlas. 2008. Atlassing for species at risk in the Maritime Provinces. A supplement to the Maritime Breeding Bird Atlas guide for Atlassers. Environment Canada.
- Martel, P. 2007. Assessing aquatic health using invertebrates. In Annual report of research and monitoring in the Greater Kejimikujik Ecosystem 2006. Parks Canada.

- McRae, D.J., Duchesne, L.C., Freedman, B., Lynham, T.J., and Woodley, S. 2001. Comparisons between wildfire and forest harvesting and their implications in forest management. *Environ. Rev.* 9: 223-260.
- Mosseler, A., Lynds, J.A., and Major, J.E. 2003. Old-growth forests of the Acadian Forest Region. *Environ. Rev.* 11:S47-S7.
- MTRI. 2008. Species at Risk in Nova Scotia: identification and information guide. Mersey Tobeatic Research Institute.
- Nagorsen, D.W. 2004. Canada's endemic mammals at risk: recent taxonomic advances and priorities for conservation. Proceedings of the "Species at Risk: Pathways to Recovery" Conference. March 2–6, 2004, Victoria, B.C.
- Neily, P. 2009. Comments on the FSC high conservation values report for Bowater Mersey Paper Company, Medway forest lands.
- Neily, P.D., Quigley, E., Benjamin, L., Stewart, B., and T. Duke. 2003. Ecological land classification for Nova Scotia. Vol 1 – Mapping Nova Scotia's terrestrial ecosystems. Nova Scotia Department of Natural Resources.
- Neily, P.D., Quigley, E., Stewart, B.J., and K.S. Keys. 2007. Forest Disturbance Ecology in Nova Scotia. Nova Scotia Department of Natural Resources.
- Newall, R.E. 2005. Provincial (Nova Scotia) status report on northern white cedar (*Thuja occidentalis*). Nova Scotia Department of Natural Resources.
- Newall, R.E. 2007. Nova Scotia provincial status report on rockrose (Canada Frostweed). Nova Scotia Department of Natural Resources.
- Nova Scotia American Marten Recovery Team. 2006. Recovery Strategy for American marten (*Martes americana*) on Cape Breton Island, Nova Scotia in Canada. Nova Scotia, Canada.
- Nova Scotia Eastern Habitat Joint Venture Project. 1993. Bowater Mersey wetlands: inventory and management recommendations. Medway District. 1997. Nova Scotia Eastern Habitat Joint Venture Stewardship Project.
- NS DNR. 2006. Forest ecosystem classification for Nova Scotia's western ecoregion. Interim report. Nova Scotia Department of Natural Resources.
- NS DNR. 2007. Recovery plan for moose (*Alces alces americana*) in mainland Nova Scotia.
- NS DNR. 2009a. Map of known locations of American marten in Southwest Nova Scotia as prepared by Nova Scotia Department of Natural Resources.
- NS DNR. 2009b. Map showing survey results of mainland moose 2000-2009 in Annapolis County.
- Operational Bulletin Respecting Alteration of Wetlands. 2006. Nova Scotia Department of Environment and Labour.

- Parker, G. 2003. Status report on the eastern moose (*Alces alces americana clinton*) in mainland Nova Scotia.
- Pentz, B. 2008. A river runs through it: an archaeological survey of the Upper Mersey River and Allains River in southwest Nova Scotia. Thesis. School of Graduate Studies. Department of Anthropology. Memorial University of Newfoundland and Labrador.
- Pockwock Bowater Watershed Project Partners. 2005. The Pockwock Bowater Watershed Project: Summary Report.
- Poulin, R.G., Grindal, S. D., and R. M. Brigham. 1996. Common nighthawk (*Chordeiles minor*). In The Birds of North America, No. 213 (A. Poole and F. Gill, eds). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.
- Smith, K. 2002. COSEWIC status report on the eastern ribbonsnake (*Thamnophis sauritus*) in Canada, in COSEWIC assessment and status report on the eastern ribbonsnake (*Thamnophis sauritus*). Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-24 pp.
- Stewart, B. 2009. Review of Forest Stewardship Council high conservation value report for Bowater Mersey Paper Company Medway forest lands by KBM Forestry Consultants.
- The Atlantic Coastal Plain Flora Recovery Team. 2004. The multiple species recovery and conservation strategy and action plan for the Atlantic Coastal Plain Flora. Nova Scotia, Canada.
- The Blanding's Turtle Recovery Team. 2003. National recovery plan for the blanding's turtle (*Emydoidea blandingii*) Nova Scotia population. Nova Scotia, Canada.
- Trombulak, S.C., Anderson, M.G., Baldwin, R.F., Beazley, K., Ray, J.C., Reining, C., Woolmer, G., Bettigole, C., Forbes, G., and L. Gratton. 2008. The Northern Appalachian/Acadian ecoregion, priority locations for conservation action. Two Countries, One Forest Special Report No. 1.
- Trout Nova Scotia. 2009. Reversing the decline on Nova Scotia's wild brook trout: a discussion paper prepared by Trout Nova Scotia. Draft report. Trout Nova Scotia.
- WWF. 2005. WWF Canada High Conservation Value Forest Support Document. Draft for Review. WWF Canada.
- White, C. M., Clum, N. J., Cade, T. J., and W. G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In The Birds of North America, No. 660 (A. Poole and F. Gill, eds). The Birds of North America, Inc., Philadelphia, PA.
- Wildlife Habitat and Watercourse Protection Regulations. 2002. Government of Nova Scotia.

