

MEDWAY COMMUNITY FOREST CO-OPERATIVE LTD.

Interim Management Plan 2016-2018

July 2016



Supporting local communities through sustainable and ecologically-based forest management



MEDWAY COMMUNITY FOREST COOP INTERIM MANAGEMENT PLAN

July 8, 2016



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IMAGES

All photos featured without references were taken by Alain Belliveau with exception of images on pages 32 & 52 taken by Katie McLean.



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MEDWAY COMMUNITY FOREST COOP INTERIM MANAGEMENT PLAN

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1. Introduction

In 2013, the Medway Community Forest Cooperative (MCFC) was awarded a three-year pilot project, by the Nova Scotia Department of Natural Resources (NSDNR), to establish the Province's first community forest. The MCFC signed a Forest Utilization License Agreement (FULA) with the NSDNR in January 2015.

Currently, the MCFC holds a Crown Land Area License on approximately 15,000 hectares (37,000 acres) within the Medway District of Nova Scotia. The Medway District is part of the former Mersey Paper Company Lands purchased by the Province of Nova Scotia from Resolute Forest Products in 2012.

The MCFC operates to sustainably manage the license area through stakeholder and community engagement and ecologically appropriate forest management activities while facilitating economic development and other opportunities for the local community. The established FULA is unique in Nova Scotia due to the emphasis on multi-use, locally governed forest management. The overall management objective for the MCFC in the duration of the pilot phase is to generate profits from ecologically appropriate forest management and other activities to enable economic support of the local community.

The MCFC land base is located entirely in Annapolis County, Nova Scotia, adjacent to an intricate network of Protected Areas, Crown Lands, Nature Reserves and Kejimkujik National Park and Historic Site (Keji) as seen in Figure 1. The MCFC license area is currently managed under the Medway District Management Plan.¹ The Medway Plan is based on a 100-year projection of the forest given the current forest condition (2000-2005 aerial photograph interpreted forest inventory updated to account for harvest and silviculture activity to 2012), anticipated forest growth, and management interventions planned over that period.

Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) certifications were in place at the time the Province and the MCFC signed the FULA, and the SFI agreement is currently maintained by the NSDNR. The MCFC is committed to continuing to manage the forest land base according to the SFI and FSC certification systems, regardless of the status of either certificate.

This management plan has been developed to meet the requirements of the NSDNR Medway District Management Plan while providing details relevant to the MCFC lands and management objectives. According to projections completed through long-term modeling using existing forest resource inventory and the MCFC Mission and Objectives (Section 1.2) as a guideline, the

¹NS DNR Forest Certification Steering Committee (August, 2015)



MCFC has been allocated with an Annual Allowable Cut (AAC) of 21,000 tonnes for all timber products on a short-term (20 year horizon).

The MCFC Management Plan has been extensively reviewed and approved by the MCFC Board of Directors. In order to ensure the MCFC fully includes the community and local stakeholders, the plan will be used as an *interim* management project that will serve as a working document throughout the duration of the MCFC pilot phase. The MCFC will facilitate an engagement strategy, as identified in Section 7 of this plan and provide our members and government with updates on the progression of the plan on a semi-annual basis.



Figure 1 - General Map: The area of the Medway Community Forest Cooperative (green), Protected Areas (yellow) and Kejimikujik National Park and Historic Site (brown).

1.1. Governance

The MCFC is incorporated as a for-profit cooperative, and is committed to facilitating a governance structure focused on transparency and community decision-making. With this considered, the MCFC is governed by a democratically elected Board of Directors. The board is comprised of seats for stakeholders within the community representing economic, environmental, social and First Nations interests (2 seats for each, respectively), and members-at-large (the remaining 4 seats). The board is limited to 12 seats, if there is a lack of representation in one seat at the time of election, a member-at-large can fill that seat for one year with the exception of First Nations seats which remain open regardless of the number of



seats that have been filled on the current Board of Directors. The MCFC Board also includes a seat for a non-voting observer, either a representative(s) from the NSDNR and/or other Provincial or Municipal government representative(s) as needed to support clear public accountability and transparency.

The for-profit structure of the cooperative has been developed to emphasize the significant economic development opportunity that exists in applying the community forest model to Nova Scotia’s transitioning forest industry. In the near term, net profits from the community forest will be directed to investing in forest management capacity with a portion set aside to establish a “Community Investment Fund” that will be used to support local business and community development. The membership is share-based and can be purchased by anyone for a nominal fee (\$25.00), all members are entitled to vote or run for the Board of Directors, participate in committee meetings, and create new businesses and licensing opportunities with the MCFC land base.

The following management plan was created to reflect the multiple values that are present within the surrounding communities. The MCFC has consulted with an extensive list of partners, stakeholders and community members and will continue to do so throughout the duration of the pilot phase.

“The for-profit structure of the cooperative has been developed to emphasize the significant economic development opportunity that exists in applying the community forest model to Nova Scotia’s transitioning forest industry.”

1.2. Mission and Objectives

The Medway District Management Plan was developed to reflect the new approach to managing natural resources described in *The Path We Share, A Natural Resources Strategy for Nova Scotia*.² The Medway Community Forest Cooperative Forest Management Plan has utilized this strategy while considering the specific values of our stakeholders, partner organizations and members. The complete By-Laws for the MCFC can be through the MCFC website³.

The mission of the Medway Community Forest Co-op is to support local communities through sustainable and ecologically based forest management. The specific objectives in meeting that vision are:

1. The forest resource is managed in such a way as to be economically viable without dependency on government subsidies in the long term
2. The Co-op will strive to support economic stability in local communities
3. The Co-op will aim for a high level of business innovation through new product development, start-up ventures, and community investment

² Nova Scotia Department of Natural Resources (2011)

³ www.medwaycommunityforest.com/mcfc-by-laws/



4. All investments and activities should strive to leverage and build local capacity
5. The land base will be managed to maximize multiple economic, social, and environmental values
6. The organizational structure and planning processes are designed to cultivate a broad level of community collaboration
7. Governance structures will have a high level of accountability and transparency to the community and board director positions will be democratically elected from an open membership
8. The forest will be managed using ecologically based forest management to maintain, enhance, or restore healthy Acadian Forest conditions
9. The forest will be managed in full consideration of the larger landscape, including protected areas and high conservation values

These objectives serve to compliment the existing Medway District Management Objectives. Both series of objectives have been included in the Management Objectives and Strategies of this plan to ensure proficient standards based on requirements for certification. The complete list of Objectives and Strategies from the MCFC and NSDNR can be found in Appendix I.

The MCFC is committed to utilizing an ecosystem-based approach to forest management. The United Nations Convention on Biological Diversity defines an ecosystem approach as “the integrated management of land, water and living resurrect [to provide] sustainable delivery of ecosystem services in an equitable way”.⁴ By implementing this approach, the MCFC will manage the land base as a component of the Medway District, and as a neighbour to various protected areas, nature reserves and parks including the Tobeatic Wilderness Area, the Snowshoe Lakes Nature Reserve, the Medway Lakes Wilderness Area and Kejimikujik National Park and Historic Site.

The Medway District is a healthy, productive forest rich in timber, ecological, and social and cultural values. As is the objective in the Medway District Management Plan, the MCFC is developing this forest management plan to take full advantage of these attributes for the benefit of present and future generations through a management process that achieves sustainability, transparency, diversity, collaboration and informed decision making.

1.3. Ownership and Management

The Medway Community Forest Cooperative land base consists of 15,064 hectares of forest lands in Annapolis County and is owned by the Province of Nova Scotia. The land base is part of the Acadian Forest Region, described as a transitional forest between the Boreal and Great Lakes - St. Lawrence Forest Regions and characterized by mid to late successional shade-tolerant forest of red spruce, eastern hemlock, and white pine and shade-tolerant hardwood forests of sugar maple, American beech and yellow birch.

⁴ United Nations Convention on Biological Diversity (2010)



The Mi'kmaw of Nova Scotia advise they have sustainably used these lands in accordance to the philosophy of Netukulimk to support their people for centuries. After European settlement, the land base has gone through numerous changes in species composition and age structure, with land clearing and wildfires caused by humans and lightning. Human-caused wildfires were particularly prevalent throughout the 18th and 19th centuries⁵.

In most recent history, the Bowater Mersey Paper Company Ltd. (BMPC) owned the MCFC land base. Throughout the period of ownership by BMPC, the land base was managed using primarily even-aged harvest practices and silviculture prescriptions for the production of softwood pulpwood and sawlogs. After the closure of BMPC and following public campaign to “Buy Back the Mersey”, the Province of Nova Scotia purchased the entire 550,000 hectares of BMPC freehold lands in the Medway, Rossignol and St. Margaret’s Bay Districts in 2012.

In the purchase of the BMPC freehold lands, the NSDNR committed to establishing a community forest pilot project. Following a submission of proposals from various groups across Western Nova Scotia, the NSDNR began negotiations with the interim proponents representing the Medway Community Forest Cooperative in October 2013. In January 2015, the Medway Community Forest Cooperative Ltd. signed a Forest Utilization License Agreement (FULA) to become a Crown Land Area Licensee with the Province of Nova Scotia for the management of the current land base.



2. Description of the Forest

2.1. Ecological Land Classification

The Ecological Land Classification (ELC) categorizes the landscape into units based on similar landscape and physical attributes, as well as finer features that characterize forest types. This information is used as a mapping tool to assist with ecosystem and forest management planning. The description of Ecodistricts, as classified by the ELC is an integral component to landscape planning and ecosystem based management used by the NSDNR in the Integrated Resource Management (IRM) planning process.

The MCFC land base lies within the Western region of Nova Scotia. The majority of the area is with the South Mountain Ecodistrict with a small amount in the south end in the LaHave Drumlins Ecodistrict. Full description of the geographic characteristics and map of the South Mountain and LaHave Drumlins Ecodistricts in accordance with the DNR report 2005 “Ecological Land Classification (ELC) for Nova Scotia”⁶, can be found in Appendix II

2.2 Natural Landscapes

In addition to the ELC, another method for classification of forests in Nova Scotia is the Natural Landscapes Classification. Natural Landscapes were developed by the Nova Scotia Department of Environment and provides a deeper analysis into the species found in landscape ecosystems. By definition, a landscape ecosystem “is a group of biotic communities, together with their environment, occurring over a particular portion of the landscape and held together by some common physical or biotic feature”⁷.

The classification divides what is described as the South Mountain Ecodistrict according to the ELC, into two landscapes, the Fisher Lake Drumlins and South Mountain Rolling Plains. The MCFC land base falls under three landscape ecosystems, the Fisher Lake Drumlins, South Mountain Rolling Plain and LaHave Drumlins as represented in Figure 2.

In comparison to the stand type data, the natural landscapes are more representative of the species found within the MCFC landbase. The few concentrations of dominant tolerant hardwood stands can be found in the areas classified under the Fisher Lake Drumlins whereas concentrations shade moderately-tolerant (dominant white pine and white spruce) are located within the South Mountain Rolling Plain landscape. The complete description of the Natural Landscapes found in the MCFC can be seen in Appendix II.

⁶ NSDNR (2005)

^{7,6} Protected Areas Branch, Nova Scotia Department of Environment and Labour (2002)



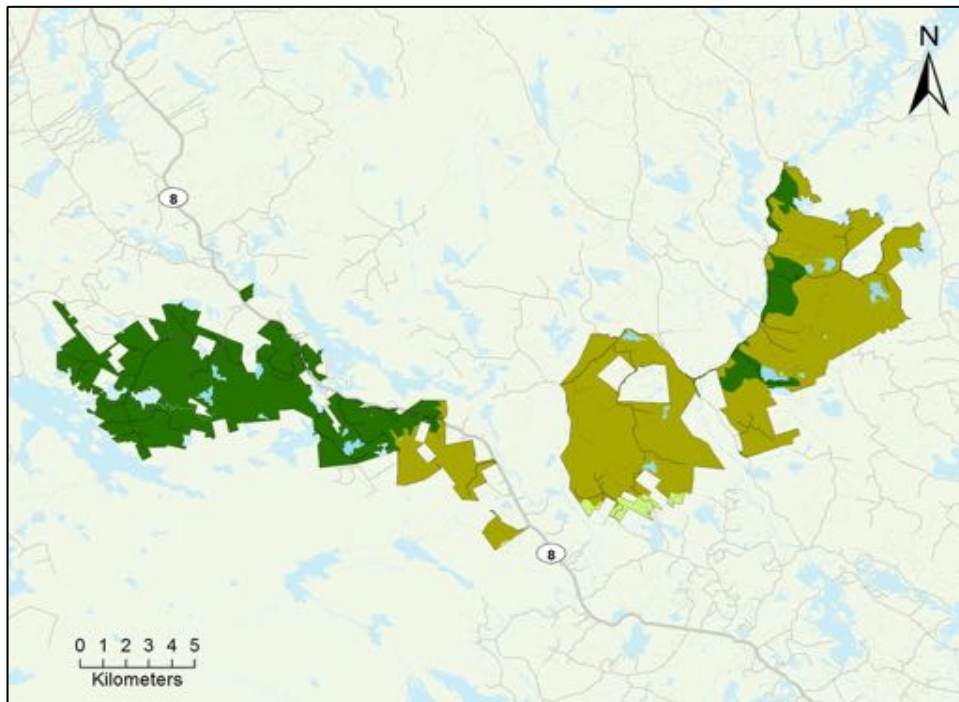


Figure 2 - Natural Landscape Classification Map: Fisher Lake Drumlins (dark green), a productive, predominately mixed-wood ecosystem is represented in 43% of the MCFC land base. The majority of the remaining landscape is classified as South Mountain Rolling Plain (56% medium green) with a very small proportion of the LaHave Drumlins natural landscape (1% - light green).

2.3 Natural Disturbance Regimes

An over-riding objective of ‘ecologically-based’ forest harvesting is to lessen harvest impacts by more closely approximating natural disturbance events. This is believed to provide the best assurance of maintaining native biodiversity, including rare species. The harvest practice of clearcutting more closely mimics a stand-replacement wildfire event (although the effects are not identical), while partial harvests emulate small blow downs or individual tree mortality caused by insects or diseases. Thus it is important to accurately define the natural disturbance dynamics that characterize the Acadian Forest where harvest operations will be carried out.

The Acadian Forest is characterized by a patch-work of multi-aged stands of trees, or an uneven aged structure and is comprised by a variety of species compositions and seral stages.⁸ The patterns for disturbances in the region are mainly small-scale, caused by wind disturbance, disease or insects. However large, stand-replacing disturbances due to fire and large insect

⁸ MTRI (2011)



infestations (i.e. spruce budworm, hemlock looper)) have also played a role in the regeneration of the Acadian Forest.⁹

Currently, the most widely utilized guide to natural disturbance regimes is work completed by NSDNR using predicted natural disturbances for classified forest areas. Climax forest types for various areas were predicted using permanent sample plot (PSP) data, old growth forest research data, historical accounts of forest conditions and recorded natural disturbance across the Province. These climax forest types contribute to the understanding of the natural disturbance regimes, which are categorized by NSDNR (2008) as frequent stand initiating, infrequent stand initiating, or gap dynamic replacement.

Infrequent stand initiating disturbance regime describes forest disturbance events when the time interval between stand initiating events is typically of longer duration than the longevity of the climax species that would occupy the site. This creates an uneven-aged or multi-cohort forest stand condition.

Gap dynamic disturbance regimes describe forest disturbance events that are at a small scale, which could include mortality of individual or small groups of trees. This creates gaps or openings in the canopy that provides opportunity for shade tolerant species to regenerate. Only a small percentage of the MCFC lands were determined to operate under gap dynamics according to NSDNR using this method.

Sites where the disturbance regime is classified as frequent occur when the time interval between stand initiating events typically is more frequent than the longevity of the climax species that would occupy the site. Often some patches of forest may survive the disturbance in pockets and as scattered individuals but with insufficient numbers to dominate the structure of the newly developing forest.¹⁰ Most of the MCFC lands were determined to operate under this disturbance dynamic according to the NSDNR methodology.

More recent research on natural Acadian Forest disturbance regimes for the South Mountain Ecodistrict has been completed since the NSDNR classification. Research funded by Kejimikujik National Park using radio-carbon dating of soil charcoal assemblages, coupled with an examination of soil profiles and macrofossils, provided conclusive evidence that stand replacement disturbances were not frequent; the average fire free interval was 330 years for the period from 1000-200 years ago.¹¹ As this period would have included fires from land clearance and other post-European activities, the natural fire free interval can be deduced to have exceeded 330 years. An examination of the time period between 2700-1000 years ago (when no Europeans were present), revealed an average fire-free period of 580 years, with the longest fire-free interval during that time being 1050 years.

According to this recent research, stand replacement fires for lands within the South Mountain Ecodistrict, encompassing Kejimikujik and nearly the entire MCFC landscape were relatively infrequent under natural conditions, with the number of fires varying from 3 to 6 for the period

⁹ Fraver et al. (2009); Seymour et al. (2002); Ponomarenko (2009)

¹⁰ NSDNR (2008)

¹¹ Ponomarenko (2009)



since deglaciation (10,000 years ago) to 200 years ago.¹¹ The fire free period exceeded 330 years during the period leading to extensive European disturbances.

Windstorms may be a stronger natural agent of disturbance in the Acadian Forest than fire¹², though wind impacts are highly variable in size and severity. There is wide-spread evidence of mass uprootings in soils in Kejimikujik and the MCFC lands. Catastrophic wind disturbances (i.e., category 2 or 3 hurricanes) are required for significant stand replacement events, and many variables factor into the wind damage extent, such as soil saturation levels, soil depth, tree species and sizes, slope orientation, and season.

Research suggests that approximately 1% on average of the Acadian forest may be replaced through gap disturbance from various mortality events caused by insects, diseases, wind and other smaller scale disturbances.¹³

2.4 Forest Inventory

2.4.1 Stand Types

Stand type inventory is based on the NSDNR forest inventory data. The current dominant forest cover in the MCFC is softwood, generally comprised of a mix of red and black spruce, balsam fir, white pine and eastern hemlock with scattered distributions of intolerant hardwood. A map showing the spatial distribution of softwood stands is shown in Figure 4.

Deciduous and mixedwood stands, although less common, are still present within the MCFC covering approximately 24% of the land base. As seen in Figure 5, the majority of deciduous stands are intolerant hardwoods, likely in restorative or young forest age classes. Stands that have a dominant tolerant hardwood composition are concentrated in the portion of the MCFC that is classified as the Fisher Lake Drumlins natural landscape.



Figure 3 - Example Stand Type: SP9 (Red Oak – White Pine/Teaberry) is a common vegetation type found in the MCFC landbase (photo: NSDNR).

¹² Seymour et al. (2002); Ponomarenko (2009)

¹³ Seymour et al. (2002); Fraver et al. (2009)



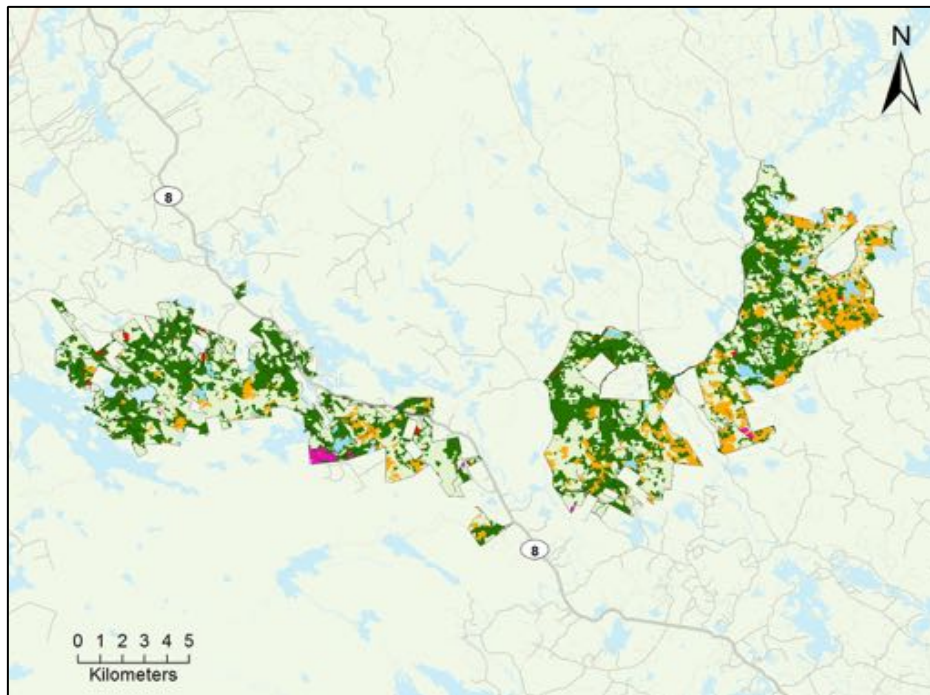


Figure 4 - Coniferous stand types: Shade-tolerant conifer-dominated (green): SP1 = EH, RS, BS, XS, BF, Shade moderately-tolerant (orange): SP1 = WP, WS, Shade-intolerant (red): SP1 = RP, TL, Other (pink): SP1 = unclassified or non-native species

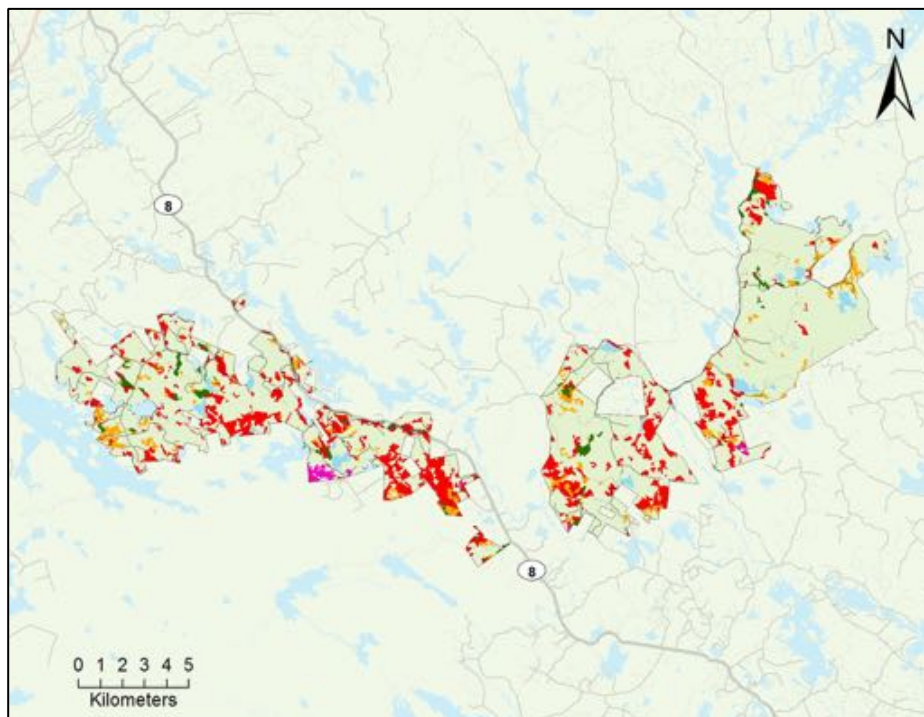


Figure 5 - Deciduous stand types: Shade-tolerant deciduous-dominated (green): SP1 = AS, BE, SM, TH, YB, Shade moderately-tolerant (orange): SP1 = RM, RO, Shade-intolerant (red): SP1 = GB, IH, TA, WB, Other (pink): SP1 = unclassified or non-native species



2.4.2 Species Composition

A composite of BMPC forest inventory and NSDNR forest inventory was created, mainly based on BMPC data, but some outstanding Crown parcels were filled in with NSDNR data. A common sense approach was used to integrate the NSDNR and Bowater data. Considering the stand type data, the most dominant species within the MCFC land base is spruce, either red, black or of hybrid varieties as seen in Figure 6 & 7. The dominance of white pine is also significant, as much of the South Mountain Ecodistrict or South Mountain Plain Landscapes is comprised of moderately shade-tolerant species including white pine.

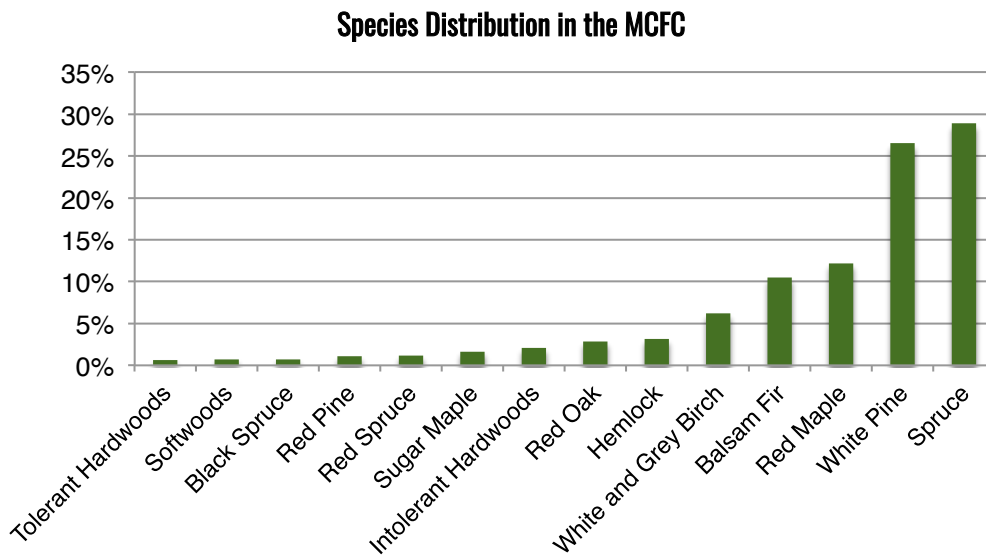


Figure 6 - Species Distribution: Depicting the percent coverage (hectares) of dominant species within the MCFC land base.

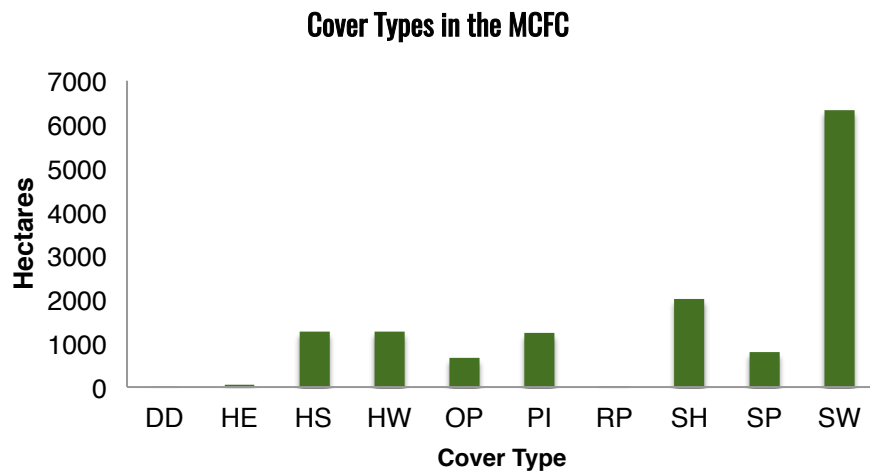


Figure 7 – Cover Types: Cover Types (DD: Dead, HE: Eastern Hemlock, HS: Hardwood dominated mixedwood, HW: Hardwood, OP: Opening [recent harvest with little regeneration], PI: Pine, RP: Red Pine, SH: softwood dominated mixedwood, SP: Spruce, SW: Softwood).



2.4.3 Forest Age Classes

Old forests (from 100 - 205+ years of age) represent approximately 9% of the MCFC land base. Generally, these forests have not been harvested or have been harvested only once historically, and have maintained some or much of their original climax species stand characteristics. Some stands in the old and restorative phase classes have been harvested since the data represented was last updated therefore the information depicted in Figure 8 is considered a close estimate to actual site-level distribution.

Forest classified as restorative, from 45 to 95 years of age represent approximately 35% of the MCFC land base. These are considered restorative opportunities because they are mature enough for potential harvesting, and may contain elements of climax species that could assist managers in promoting self-sustaining forest stands.



Figure 8 - Old Forest Map: For the purpose of future planning, 'Old Forests' were considered in the range of 100 to 205+ years of age. Darker green indicates older forests within the MCFC, whereas younger, old stands are depicted in progressively lighter shades of green.



Young forests (0 to 35 years of age), or forests in a regenerative stage represent approximately 45% of the MCFC land base (see Figure 9). This classification includes the NSDNR “Young forest” layer, plus recent harvests according to 2012 Landsat 8 archived, and according to recent MCFC harvest layers. The vast majority (>95% of area) of recent harvests (last 40 years) were harvested by Bowater / Resolute Forest almost entirely by intensive forestry operations such as clearcut harvesting.

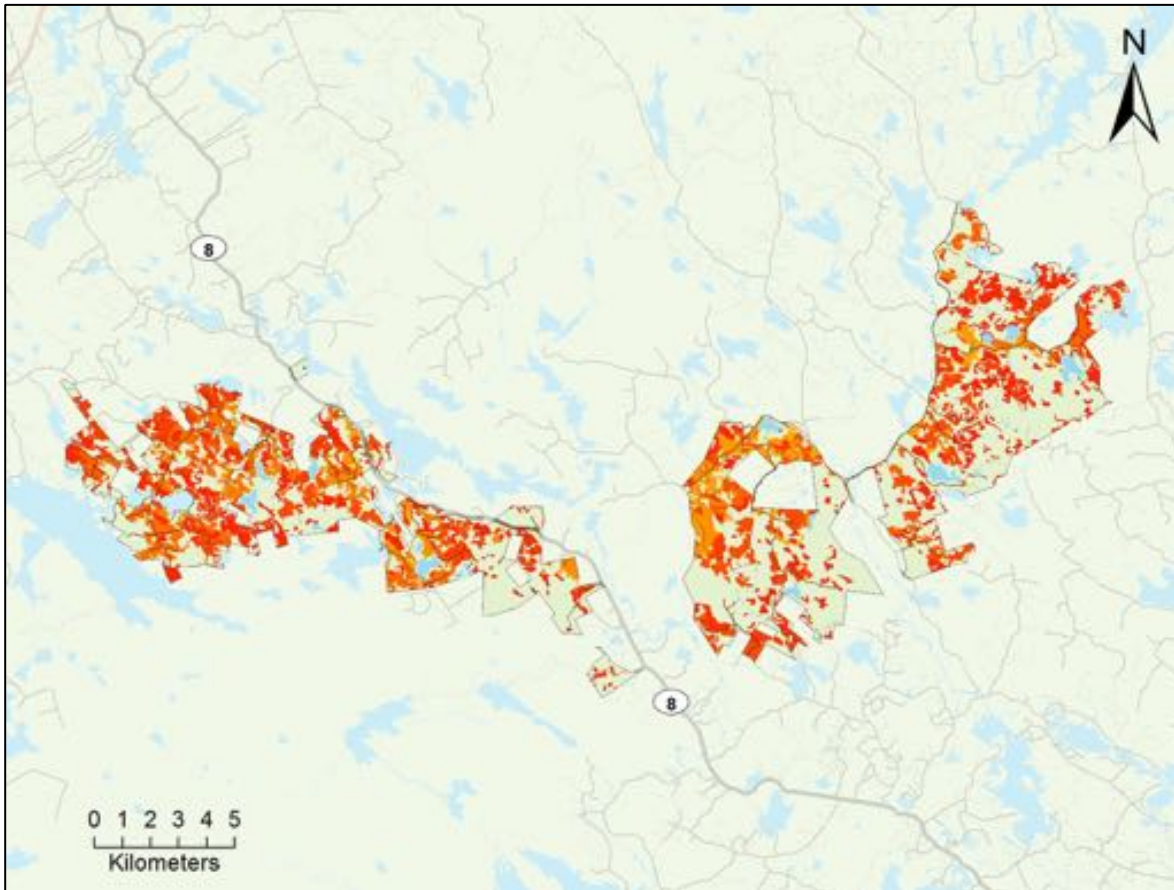


Figure 9 - Young Forests Map: Orange indicates older forests within this class, while red indicates younger forests within this class. Map excludes harvests completed by the MCFC in 2016.

2.4.4 Productivity / Land Capability / Growth Rates

Land capability created from 1963 to 1994 Canada Land Inventory Data was used to provide a basis for land use planning by determining land capabilities for wildlife, recreation, agriculture and forestry. The majority of the MCFC land base for hardwood species is under land capability classes 3-4 indicating a growth of 2.5-4.4 cubic metres per year, whereas the softwood land capability ranges from classes 4-6, indicating growth rates of 3.6 – 6.5 cubic metres per year. Maps of the land capability for hardwoods and softwoods can be found in Appendix III.



Management Strategies and Objectives

3. Forest Ecosystem Diversity

3.1 Landscape Level Planning

Objective 1: Forest management practices will be designed and conducted to conserve and enhance the health and natural diversity of Nova Scotia's forest ecosystems. The forest will be managed using ecologically based forest management to maintain, enhance, or restore healthy Acadian Forest conditions

3.1.2 Forest Ecosystem Classification and Pre-Treatment Assessments

The MCFC is committed to managing the forest land base considering multiple values and using ecosystem-based techniques that conserve biodiversity and natural ecosystem conditions and processes. Through management under the guidance of the NSNDR Forest Ecosystem Classification (FEC) and Pre-Treatment Assessments (PTA), the MCFC will use harvest techniques and silviculture prescriptions that promote vegetation types characteristic of the Acadian Forest in western Nova Scotia and increase multi-aged, old growth and late-mature age class forests.

The PTA program was established as a means to implement the Nova Scotia Code of Forest Practice on Crown land and as a guide for management on privately owned woodlands¹⁴. A PTA includes the stand-level evaluation of the forest condition/characteristics and the FEC. This evaluation requires data collection on stand-level details including vegetation type, soil type, ecosites and windthrow hazard, and stand characteristics including basal area, species, tree diameter, height, potential quality and existing regeneration. In addition, special wildlife, cultural and geological features are also noted as well as any other biological factors that may impact operations within the stand or its ecological integrity.

Similar to all Crown lands in Nova Scotia, harvest and silviculture prescriptions will be guided by ecosystem-based management and the objective to sustain ecological functions in the intersecting ecosites according to the FEC. The MCFC will implement heightened conservation and restorative values within our land base. For example, all harvesting and silviculture prescriptions will promote vegetation types that are characteristic of the optimal stand structure according to the FEC or prior to human intervention. Implementing the PTA program will regulate this process and promote the establishment of vegetation types characteristic of the Acadian Forest Region. With the use of these techniques as well as increasing the proportion of

¹⁴ NSDNR (2008)



lands managed through partial harvests, the MCFC’s intention is to restore the integrity of the multi-aged, Acadian Forest landscape within the land base.

With the consideration of the landscape management planning for the Medway District, the MCFC will use the NSDNR Old Forest Policy¹⁵ to identify old growth and potential old forest restoration opportunities within the MCFC. The MCFC will seek to expand the forest cover of mature age class stands past the 9% current forest cover (see Figure 7) within our land base. Forests that are classified as late seral or have old growth conservation reserves, when appropriate, can be harvested in a manner that will not alter an existing uneven age structure.

The complete silvicultural ground rules for operations within the MCFC, and amendments to criteria within the PTA program can be found in Section 4.2 and Appendix VI.

Landscape-Level Strategies:

- 1) Consider landscape level objectives to restore natural variability of stand types.
- 2) Consider values associated with planning units defined “A Conceptual Plan for Western Nova Scotia” developed through the Western Crown Land Planning Process.
- 3) Mimic natural disturbances and sustain natural ecosystem structure and function.
- 4) Promote regeneration of species native to the Acadian Forest.
- 5) Increase the proportion of multi-aged, old growth and late-mature age class forests in the MCFC.
 - a. Use partial harvest techniques and silviculture prescriptions according to the FEC and PTA.
- 6) Maintain or restore species diversity for underrepresented species and tolerant hardwood species.
 - a. Use the FEC to guide forest management prescriptions to reach appropriate species composition in extensively managed forests with consideration of NSDNR’s objective to reduce clear cutting in the Medway District.

Indicators:

- Percent of total area designated following prescription based on the NSDNR FEC/PTA and/or MCFC silviculture ground rules (Section 4.2).
- Percent of total area of the MCFC converted to plantation (as defined by FSC Maritime Standard).
- Percent of harvest and silviculture operations in compliance with specifications from the harvest prescription.

Monitoring and Reporting:

- Compliance with Standard Operating Procedures (SOP) and treatment prescriptions is verified through compliance checks on operations; NSDNR internal audits and MCFC internal audits of the MCFC management plan requirements.

¹⁵ NSDNR (2012)



- Regeneration surveys are completed on all harvest areas within three years of harvest. Results of regeneration surveys are compiled and reported annually at the MCFC management plan review.
- Area of MCFC in plantation form (as defined by FSC Maritime Standard) will be tracked and reported annually at the MCFC management plan review.

3.2 Stand Level Planning

Objective 2: Forest management practices will be conducted according to the Ecological Land Classification system for Nova Scotia.

The aim of the MCFC is to conserve, restore and enhance the health and biodiversity of the land base. By implementing strategies to facilitate Acadian Forest restoration, the MCFC will use the FEC and PTA systems to implement silviculture that is consistent with the natural variability and natural disturbance patterns appropriate to individual stands.

Future management interventions will be designed to eliminate exotic tree and shrub species where they currently exist. Exotic tree species will not be used for reforestation or stand conversion. Offsite species from more southern seed zones may be considered for trial and research purposes, specifically for the implementation of assisted migration and climate change mitigation studies.

Natural disturbance regimes and natural vegetation types are the basis of harvest and silviculture prescriptions on all lands in the Medway District. In addition to natural disturbances, the risk of blow-down, landscape spatial structure, inherent stand condition and site-level biodiversity features will be used in determining harvest prescriptions by conducting a PTA. On sites where the natural vegetation type has been significantly altered as a result of past forest management, measures will be taken during the next scheduled intervention to facilitate the restoration of the site to an appropriate vegetation type.

Stand-Level Strategies:

- 1) Implement management strategies using the Nova Scotia FEC and PTA systems.
- 2) Limit the management of stands in older age classes or have existing uneven-age structure.
- 3) Only use native seedlings for all plantations.
- 4) Implement maximum clearcut size of 15 hectares
- 5) Minimize ecological impact by maintaining coarse woody debris, wildlife clumps and corridors, stand connectivity and riparian buffers.
- 6) Minimize ground disturbance in accordance to guidelines within the FEC for individual soil types.
- 7) Develop management strategies to build a multi-aged stand structure with species representative of the western interior Acadian Forest.
 - a. Increase intervals between partial harvest entries, restoring the age classes and structure of long-lived species.
 - b. Plan silviculture to facilitate development of Intolerant Hardwood stands to Tolerant Hardwood Forest Group.



Indicators:

- The percent of harvest operations that have been assessed using the PTA program and harvest prescriptions developed based on FEC.
- The percent of managed stands retaining older, multi-aged structure.

Monitoring and Reporting:

- Compliance verified through the Integrated Resource Management approval process.
- Compliance of prescriptions and proper work procedures verified through post-harvest compliance checklists.

3.3 Landscape Connectivity and Protected Areas

Objective 3: Forest Management practices will recognize the contribution of protected and wilderness areas in preserving the natural forest heritage within Nova Scotia.

The MCFC land base is located adjacent to a unique and biodiverse landscape of wilderness and protected areas, Kejimikujik National Park and Historic Site as well as Crown Land designated in both intensive and extensive landscape management units. Based on the geographic area, MCFC operations require careful consideration of the impacts to shared boundaries between the land base and Kejimikujik, The Tobeatic Wilderness Area, The Medway Lakes Wilderness Area, Skull Bog Lake Nature Reserve and Snowshoe Lakes Nature Reserve.

The MCFC will develop harvest and silviculture prescriptions on lands within 500 m of all parks and protected areas that will maintain the conservation values specific to these natural areas.

The location of the MCFC land base emphasizes the importance of developing management techniques that preserve key landscape features and maintain landscape connectivity. In consideration of the natural sites within the region, the MCFC will implement restoration practices in the ecosystems that are underrepresented within the Medway District.

Landscape-Level Objectives:

- 1) Maintain landscape connectivity and biodiversity associated with protected areas.
- 2) Minimize impacts of forest fragmentation on forest components that require continuous forest canopy, or more stable forest conditions and wildlife
- 3) Enhance and protect underrepresented ecosystems within the MCFC land base.

Stand-Level Objectives and Strategies:

- 1) Maintain conservation standards in lands within 500m of Parks and Protected Areas and the MCFC.
- 2) The construction of new roads in areas adjacent to boundaries of Provincial Wilderness Areas, Nature Reserves and parks will be minimized or avoided.



Indicators:

- Percent of roads in areas adjacent to boundaries of Provincial Wilderness Areas, Nature Reserves and parks, in locations that minimize conservation impacts.
- The distribution and percent of growth in underrepresented ecosystems within the MCFC land base.
- Percent of operations within adjacent protected areas that were planned in consultation with protected area managers.

Monitoring and Reporting:

- Compliance with requirement of SOPs for planning road location will be verified through compliance checks on road construction operations, Results of the NSDNR and MCFC internal audits and summary of compliance checks will be reported annually at MCFC management plan review.
- List of designated forest conservation reserves within the MCFC land base.
- List of legally designated nature reserves (according to Nova Scotia Environment Protected Areas Branch) bordering the MCFC land base
- List of all management activities within the protected areas buffer.

3.4 Carbon Sequestration and Climate Change Mitigation

Objective 4: Forest management will be designed and conducted with consideration of potential effects of climate change and opportunities to maintain and enhance carbon sinks.

MCFC acknowledges the importance of forest carbon management and the environmental and economic benefits that can arise from implementing systems that utilize existing carbon sinks and build capacity for increased carbon storage. The management strategies adopted by the MCFC consider the importance of natural diversity and aim to enhance the ability for ecosystems to respond to climatic change and store carbon.

The ability to increase carbon sequestration on the MCFC land base is epitomized in the ability to perform Improved Forest Management (IFM). By definition, IFM means a system of practice for the use and stewardship of forest lands, which may include production of harvested wood products, which reduces greenhouse gas emissions (GHG) and/or increases carbon sinks.¹⁶ IFM is rooted in the basis that as unmanaged forests age, they are not able to uptake as much carbon as mid-successional stands, all while maintaining positive net carbon sequestration¹⁷. As forests age, and reach a mature – late successional age class, carbon storage is greatest.¹⁸

Through using principles of IFM, the MCFC will strive to increase forest growth through the ecosystem-based management principles of the FEC and PTA. In order to account for the

¹⁶ BC Forest Carbon Offset Protocol (2011)

¹⁷ Nunery & Keeton (2009)

¹⁸ Luyssaert et al. (2008)



carbon currently stored in the MCFC land base, the MCFC will aim to conduct a carbon inventory during the pilot phase, including an analysis of carbon values in forest inventory GIS data, aerial imagery and landscape inventory data.

Landscape-Level Objectives and Strategies:

The MCFC is committed to maintaining and improving the volume of carbon stored on the land base. Through sustainable forest management, the MCFC will minimize the impacts of climate change by:

- 1) Implementing protection measures in wetlands, tree bogs and wet forests.
- 2) Implementing forest-monitoring programs to detect outbreaks of pests and pathogens.
- 3) Road construction, bridge and culvert installation and partial harvest specifications will account for the predicted increase in extreme weather events.
- 4) Working with the NSDNR and other partners to develop a carbon-offset project that will generate new forms of revenue to support partial harvesting and the sustainable management practices necessary to perform IFM.
- 5) Manage forest lands using techniques that mimic natural disturbances and sustain natural ecosystem structure and function.

Stand-Level Objectives and Strategies:

- 1) Maintaining minimum retention requirements for residual structures on all harvest operations.
- 2) Encourage natural seeding in all harvested sites and where necessary, use only native seedlings on all planting operations.
- 3) Implementing principles of IFM in management operations by conducting FEC and PTA on all new harvest areas.
 - a. Harvest and silviculture prescriptions based on the FEC will promote the establishment of a natural range of species resulting in forest that are more adaptable to changing climate.
- 4) Ensuring all harvested areas meet minimum standards for stocking of acceptable species.
- 5) Increasing representation of old and mature forests, and maintenance of a full range of stand structure and ages, species and ecosystems.
 - a. Enhance on-site logging techniques and contractor training to maintain older, legacy trees and trees that possess special biodiversity characteristics.

Indicators:

- Percent of harvested areas adequately stocked with acceptable species through natural regeneration.
- Percent of roads, bridges, culverts and partial harvest operations that meet specifications defined in SOPs.
- Number of instances of pest or pathogen infestation identified.
- Percent of harvest and silviculture operations in compliance with specifications for prescription.
- Percent of partial harvests completed.



- Percent of old and mature forest stand representation.

Monitoring and Reporting:

- Results of compliance checks on harvesting and silviculture are reported regularly, results of the NSDNR and MCFC internal audits and a summary of compliance checks will be reported annually at MCFC management plan review.
- Results of compliance checks on road construction, bridge and culvert installation are reported regularly, results of the NSDNR and MCFC internal audits and a summary of compliance checks will be reported annually at MCFC management plan review.
- Results of regeneration surveys to be reported annually at MCFC management plan review.
- Condition and carbon inventory for managed areas used as assessment for future development of Improved Forest Management in the MCFC.



4. Timber Resource

4.1 Sustainable Management

Objective 5: Forest Management practices will be designed and conducted to secure a long-term sustainable harvest of forest products

The annual allowable cut (AAC) for the Medway Community Forest Coop land based on a short-term (20 year average) horizon will be 21,000 green metric tonnes (gmt) of all species for each 12-month period. The MCFC is required to harvest a minimum of half of the AAC volume (10,500 gmt) averaged over the duration of the pilot project phase. The total AAC was set by a timber supply analysis conducted by the NSDNR to predict total growing stock and productivity. A detailed breakdown of the values projected from the MCFC model can be found in Table 1.

The analysis is based on up-to-date forest inventory and growth and yield estimates from the Nova Scotia Crown Lands Forest Modeling (CLFM) database (v2016.1) that was run through a 100 year planning horizon using the Woodstock forest modelling software¹⁹. The wood supply results presented in this report were aligned with the long-term strategic forest model assumptions from Provincial timber Objective standards set in place by stakeholder meetings and following provincial standards. The MCFC also set specific aspatial queries²⁰ to reflect the management objectives and are representative of the goals set by the MCFC membership.

From the original license area, the MCFC working land base was determined by excluding inoperable areas within the land base including areas designated for DNR Moose Habitat Buffers, Coastal Plains Flora Buffers, the DNR Old Growth Policy and biogeographical exclusions including wetlands, watercourses and treed bogs. With these considered, the MCFC Working Land Base is approximately 13,731 hectares.

The MCFC set constraints for NSDNR to consider and build into their model projections. One of these constraints was to ensure that two thirds of all harvests (66%) are completed through partial harvests, and one third using clearcut and seed tree harvest prescriptions (33%). This constraint was established to reflect the limitations on stand types where clearcut and seed tree harvests would be acceptable as determined by the MCFC Board and documented in the Silvicultural Ground Rules For Timber Harvest in the MCFC (Appendix IV).

The other constraint defined by the MCFC was to eliminate the traditional weighting scheme used to place an emphasis on more merchantable products rather than species diversity. The MCFC has placed equal weight on all product classes including spruce/fir, other softwood and hardwood.

¹⁹ Computer software developed by Remsoft used to calculate and compare the result of forest management alternatives.

²⁰ Questioning data (through GIS) based on non-spatially specific attributes



HARVEST AREA (HA/YR): SHORT-TERM (20YR AVG) Based on approx. 14,000 ha working land base	
Clearcut (Clearcut/Overstory Removals)	77
Partial Cut (Selection/Commercial Thinning/Shelterwood)	154
SUB-TOTAL	231
SILVICULTURE AREA (HA/YR): SHORT-TERM (20YR AVG)	
Planting	1
Precommercial Thinning	36
Early Competition Control (Weeding)	0
SUB-TOTAL	37
TREATMENT FUNDING (\$/YR): SHORT-TERM (20YR AVG)	
Silviculture (Planting/PCT)	\$30,000
Partial Harvest (Selection/Commercial Thinning/Shelterwood)	\$85,000
SUB-TOTAL	\$115,000
HARVEST (GMT/YR): SHORT-TERM (20YR AVG)	
Hardwood	4,000
Softwood	17,000
Other Softwood (Pine/Hemlock/Larch)	6,000
Spruce-Fir	11,000
TOTAL	21,000
HARVEST (GMT/YR): LONG-TERM (50 YEARS OUT)	
Hardwood	4,000
Softwood	25,000
Other Softwood (Pine/Hemlock/Larch)	6,000
Spruce-Fir	18,000
TOTAL	29,000

Table 1 - Results of the NSDNR model for the MCFC land base: The scenario above is modified from the original Provincial Timber Objective (PTO) to account for the MCFC’s mission and objectives. Modifications include ensuring that 66% of all harvests are partial cuts and spruce/fir species do not hold value (weighted) over diversity



Harvesting priorities, in accordance to MCFC’s Mission and Objectives (Section 1.2 & Appendix 1) will be focused on maintaining long-term economic stability and environmental sustainability. All forest management practices on the MCFC land base will be conducted according to the FEC system for Nova Scotia. Areas planned for harvest will have a Nova Scotia PTA prepared that describes the site and forest condition. The MCFC will then determine a harvest prescription that considers the results of the PTA, the surrounding land uses and special wildlife or biodiversity characteristics on a site level.

Further information regarding the Nova Scotia Provincial Timber Objective model can be obtained through contacting the NSDNR Forest Inventory team.²¹

To ensure the long-term, sustainable management of the MCFC, harvest levels will not exceed the target AAC outlined from the wood supply model. The MCFC is committed to ensure the forest resource is available for commercial use by the community for generations to come. In order to do so, the MCFC will implement silviculture programs that maintain the growth rates and mitigate any unforeseen damages (i.e. natural disturbances, pests or disease).

Landscape-Level Objectives and Strategies:

To maintain the ecological integrity of the MCFC as well as maximize the value of the timber resource, the MCFC will take the following steps to ensure long-term sustainable forestry:

- 1) Ensure the timber resource is managed at sustained yield.
 - a. Develop operational plans that reflect sustainable harvest levels by harvest method and outline the silviculture treatment required to support the sustainable harvest
- 2) Maintain and support natural regeneration,
 - a. Assess all harvest areas for natural regeneration within three years of harvest. Areas that do not meet minimum standard for stocking with acceptable species will be planted as required in SOPs for silviculture.
- 3) Avoid significant losses to harvestable timber volumes
 - a. In the event of a large-scale disturbance within the MCFC land base, alter harvest plans to direct efforts towards salvaging merchantable timber in consideration of the ecological benefits associated with the disturbance.
- 4) Maintain ecosystem function on a minimum of 90 percent of the entire MCFC land base.

The MCFC is committed to ensure the forest resource is available for commercial use by the community for generations to come.

Stand-Level Objectives and Strategies:

- 1) Greater than 80 percent stocking for planted trees.
- 2) Species planted will be native to the Acadian Forest.
- 3) Maximize fibre production by using genetically improved seed for all plantations.
- 4) Maintain “free to grow”²² at all stages of development.

²¹ <http://novascotia.ca/natr/forestry/contact.asp>



- 5) Minimize ecological impact by maintaining coarse, woody debris, wildlife clumps and corridors and riparian buffers.

Indicators:

- Volume of timber products harvested by harvest method compared to levels determined to be sustainable.
- Silviculture program implemented compared to levels required to support sustainable harvest.
- Percent of harvest areas regenerated to acceptable species through natural regeneration or planting.
- Area treated with various silviculture prescriptions compared to what is required to support AAC.
- Actual harvest compared to AAC (averaged over 5 year period).
- Percent of area identified as having inadequate natural regeneration of preferred crop trees that have been planted.
- Percent of seedlings planted that are from tree improvement programs appropriate for Nova Scotia.
- Percent of planted areas that has been assessed three years following planting.
- Percent of harvested areas that have received a 10-15 year stand assessment.
- Total area receiving pre-commercial thinning compared to area required to maintain AAC as defined by wood supply model.
- Percent of area pre-commercially thinned that meet treatment specifications.
- Area and volume harvested by method, during current five-year period, compared to what is required to ensure sustainable harvest as defined by the wood supply model.
- Actual silviculture treatment by area, during current five-year period compared to what is required to ensure sustainable harvest as defined by the wood supply model.

Monitoring and Reporting:

- Harvest volume by species and product will be reported annually and reported at the MCFC management plan review.
- Silviculture programs will be reported annually at MCFC management plan review.
- Results of regeneration surveys will be reported annually.
- Growth and condition of areas planted are assessed the year the plantation is established and three years following to determine survival of planted trees and silviculture prescriptions required to control competition.
- A formal assessment of areas meeting the FSC definition of plantations will be made 15 years following planting and every five years after that to assess survival and growth of planted trees and the ecological and cultural impact of the plantation. Plantations established prior to FSC certification that have reached 15 years of age will have growth plots established within the years covered by this management plan (2015-2018).

²² “Free-to-grow” can be defined as a stand of healthy trees of a commercially or ecologically valuable species, the growth of which is not impeded by competition from plants, shrubs or other trees.



- Areas planted with non-native species will be monitored every five years for growth, invasiveness, unusual mortality, disease or insect outbreak, and adverse ecological impacts. The initial assessments of all sites will be completed within the time period covered by this Plan (2015-2018).

4.2 Improved Forest Management and Silviculture

Objective 6: Forest management practices will be designed and conducted to improve productivity, quality and value of forests and forest products.

4.2.1 Prescription Details

Commercial Thinning

The goal of this treatment is to maximize the growth rate and stem quality the existing growing stock in a stand. Commercial thinning may also offer the opportunity to diversify the age class distribution and generally improve the wind firmness of root systems to provide more management options on the next entry.

- Remove 25-30 percent of basal area
- Minimize removals on NE, E, or SE facing slopes
- No removal in wet areas
- No openings created larger than 10 m
- Early gap or small patch harvests within commercial thinning areas dominated by intolerant species are encouraged to diversify age class structure in the stand
- 20m buffers maintained on watercourses
- Wildlife habitat clumps and machine exclusion zones as prescribed in Wildlife Habitat Regulations

Selection Harvest

The goal of a selection harvest is the removal of merchantable volume while maintaining and promoting the quality of the remaining growing stock. A selection system assumes periodic return entries when basal area exceeds optimal levels. Harvest should be targeted to stems of lower quality and declining vigour. Ideal harvest pattern would result in the following distribution in the residual structure

Poles (10 – 20cm)	Small (22 – 34cm)	Medium to Large (36cm +)
30%	40%	30%

- Minimize large openings in stand to minimize risk of blowdown
- Remove up to 1/3 of the density at each subsequent entry resulting in an uneven-aged stand
- In general stand basal area should not be reduced below 16m²/ha



- Trail spacing average no more than 26 m measured from centreline to centreline
- Trail width average no more than 6 m measured from tree line to tree line
- Leave dead trees standing for wildlife habitat where safety allows
- Target removal of intolerant species - leave tolerant species consistent with the vegetation type
- Minimize damage to residual trees
- Minimize trail width
- 20m buffers maintained on watercourses
- Wildlife habitat clumps and machine exclusion zones as prescribed in Wildlife Habitat Regulations

Systematic Patch Shelterwood Harvest

The goal of a patch removal system is the harvest of merchantable volume is in a pattern that emulates natural gap disturbance. This treatment is particularly well suited to species that are intermediately shade tolerant, in stands of low stem quality, and to promote more diversified age class distribution. This pattern is recommended when there is a higher percentage of UGS in a stand or if windthrow risks make a single/group tree selection system less suitable.

- Approximately 20% of area harvested per entry
- Initial entry creates gaps of less than 0.13 ha
- 3-5 legacy trees left per patch
- Subsequent entries expand the gaps
- Trail width average no more than 7 m measured from tree line to tree line
- 20m buffers maintained on watercourses
- Wildlife habitat clumps and machine exclusion zones as prescribed in Wildlife Habitat Regulations

Shelterwood Harvest

The goal of a shelterwood harvest is to promote the regeneration of favourable growing stock where shade tolerant species dominate. Shelterwood is also effective at promoting stem quality if residual structure is maintained throughout the pole stage. Shelterwood should only be used in stands where the residual structure has enough longevity to survive through until the next harvest entry.

- Remove 30% - 40 % of basal area
- Leave dead trees standing for wildlife habitat where safety allows
- Target removal of intolerant species - leave tolerant species consistent with the vegetation type
- Minimize damage to residual trees and trail width
- Return interval may be delayed until commercial thinning stage for newly regenerated structural cohort as a means to promote late seral structure. Encouraged where long-lived tolerant species make up 70% or more of the residual structure.
- 30m buffers maintained on watercourses
- Wildlife habitat clumps and machine exclusion zones as prescribed in Wildlife Habitat Regulations.



Seed Tree and Overstory Removal Harvest

The goal of a seed tree or overstory removal is the harvest of merchantable volume and the initiation of a new regeneration. These harvests may be appropriate where stand replacing disturbances are more frequent or where partial harvest options are not suitable to the species composition, stem quality, structural composition, or windthrow hazard.

- Maximum opening size of 15ha
- Buffer between openings 100m
- Greenup age for seed tree and overstory removal patches is 15 years if stand initiation silvicultural treatments have been implemented, or 20 years if stand has had no prior silviculture treatments.
- 30m buffers maintained on watercourses
- Wildlife habitat clumps and machine exclusion zones as prescribed in Wildlife Habitat Regulations



Figure 10 – Example Seed Tree Harvest: MCFC Forestry field tour participants visit seed tree harvest completed in the MCFC license area during Spring 2016.



5. Non-Timber Resources

5.1. Non-Timber Forest Products

Objective 7: The land base will be managed to maximize multiple economic, social and environmental values. Forest management practices will be designed and conducted to consider structure and diversity elements required for the integration of public interests.

The MCFC land base contains a vast array of non-timber resources, from recreational trails (referred to in Section 5.2) and access points to commercially viable products such as mushrooms or berries. Non-timber forest products (NTFPs) traditionally defined as goods and services derived from forests that are not in the form of timber, pulpwood or other conventional wood products. Many NTFPs are used for cultural, subsistence and recreational purposes and have significant importance to local Mi'kmaq and community groups. In addition, many varieties of mushrooms including chanterelles (*Cantharellus Cibarius* – see Figure 11), Matsutake (*Tricholoma Magnivelare*) and Chaga (*Inonotus obliquus*) as well as a variety of gourmet varieties are harvested publically, contributing to the local economy.

In order to adequately and sustainably manage the NTFP inventory, steps will be taken to improve reporting on the extent of populations of NTFPs, particularly for those products that can be harvested and removed from the MCFC land base. Through GIS mapping using species inventory distribution values, the MCFC has developed a baseline inventory of possible locations of a variety of NTFPs. However, ground-level sampling is required in order to verify locations, distribution and populations. Maps identifying the possible locations of NTFP including; birch products, maple syrup, fir trees for wreath making, matsutaki and chanterelle mushrooms can be found in Appendix V. Through mapping, the MCFC has the ability to adapt harvesting practices to mitigate impacts on NTFPs and promote the ecosystem functionality required for sustainable harvesting.

Concerns regarding the harvesting of NTFPs are often raised due to the inability to fully understand the thresholds for sustainability within populations. The ability for the MCFC to influence the sustainable management of NTFPs involves contributions to provide inventory, maintain populations, control harvests and conduct research and careful monitoring. With proper decision-making, the MCFC can facilitate management approaches that can positively impact a variety of NTFP populations in the region by completing research on sustainable levels of harvesting.



Figure 11 – Chanterelle Mushrooms: A common species in the MCFC land base, chanterelles are a favourite in gourmet cooking and easy to find (photo: Steve Taylor).



Landscape-Level Strategies:

- 1) Build inventory for NTFP within the MCFC.
 - a. Expand on baseline inventory created through mapping with ground-truth analysis.
- 2) Identify management objectives for NTFP.
 - a. Prioritize inventory NTFP and propose measures to control over-harvesting.
- 3) Implement management strategies and monitoring programs for sustainable harvesting of NTFP within the MCFC.
 - a. Develop licensing or permit system for individuals accessing the MCFC land base for NTFP harvesting
 - b. Approach individuals accessing the MCFC land base for NTFP harvesting and help facilitate rates of sustainable harvest.
 - b. Track the number of people accessing MCFC lands to provide some estimate on the volume harvested.
- 4) Continue to explore opportunities and partnerships for sustainable management of NTFPs.

Indicators:

- Percent of forest operations that have been planned in consideration of NTFP maps.
- Baseline inventory regarding the number of individuals accessing the MCFC land base for NTFPs.
- Opportunities provided for Mi'kmaq of Nova Scotia to access MCFC lands for NTFP collection.
- Documented SOPs designed for ecosystem maintenance or enhancements required for NTFP production in conjunction with NSDNR.
- Opportunities provided for local groups, the Mi'kmaq of Nova Scotia and individuals with interest in harvest NTFPs to identify areas of importance.
 - o Number of interest groups consulted
- Percent of forest operations, in the vicinity of areas of significant cultural value, in compliance with measures developed to protect their unique features.

Monitoring and Reporting:

- Opportunities provided to stakeholders, the Mi'kmaq of Nova Scotia and members of the public to share ecological knowledge and participate will be recorded.
- List of areas of cultural significance and percent of operations in compliance with requirements to protect their unique value will be monitored.
- Known harvest sites to be monitored on a regular basis



5.2 Recreation:

Objective 8: The land base will be managed to maximize multiple economic, social and environmental values. Forest management practices will be designed and conducted to balance the economic, cultural, social and environmental interests.

The MCFC is in a unique geographical position, adjacent to Southwestern Nova Scotia’s expansive network of Parks and Protected Areas. Considering this location, the MCFC has the ability to provide services that may not be offered in nearby Parks and Protected Areas and develop infrastructure to promote public access to these areas. By working with recreation stakeholders, and with the Nova Scotia Environment Protected Areas branch, the MCFC hopes to act as a service provider for local businesses to access the land base and the neighbouring Medway Lakes Wilderness Area.

5.2.1 Motorized Vehicle Recreation

As a Crown Land Area License holder, the MCFC has the ability to facilitate numerous recreation ventures throughout the land base with and control access to sensitive environments. In order to minimize the pressure on adjacent Crown Lands and Protected Areas, the MCFC will work together with motorized vehicle organizations to build an access agreement for use of the land base. By utilizing existing forest service roads and trails, there is the potential to develop trails for motorized vehicles routes in areas that do not possess special ecological characteristics and/or features less likely to be adversely impacted by motorized vehicle activity.



5.2.2 Non-motorized Vehicle Recreation

The development of recreational trails for specific non-motorized groups such as mountain biking, hiking or cross-country skiing, will serve to compliment the services offered by Kejimikujik National Park and not to serve as a competitor. Due to the current seasonal closure of Keji, the MCFC is in a position to offer winter recreation opportunities to community members and tourists.

There is already extensive use of the MCFC land base by the public, and the expansion of services and facilities will diversify user groups and encourage active living in



the local community. Through the inclusion of local recreational groups in stakeholder engagement and the planning process, the recreational services developed by the MCFC will serve the needs of these groups directly and promote the stewardship of the MCFC land base and facilities in the future.

Trails and Canoe Routes

There are roughly 50 km of canoe routes within or adjacent to (within earshot or 1600m)²³ the MCFC. All woods roads within the MCFC equal a distance of approximately 165 km, whereas important thru-ways²⁴ are approximately 25 km. The recreation access map (Figure 12) details the extent of canoe routes and campsites within the MCFC and the Medway Lakes Wilderness area.

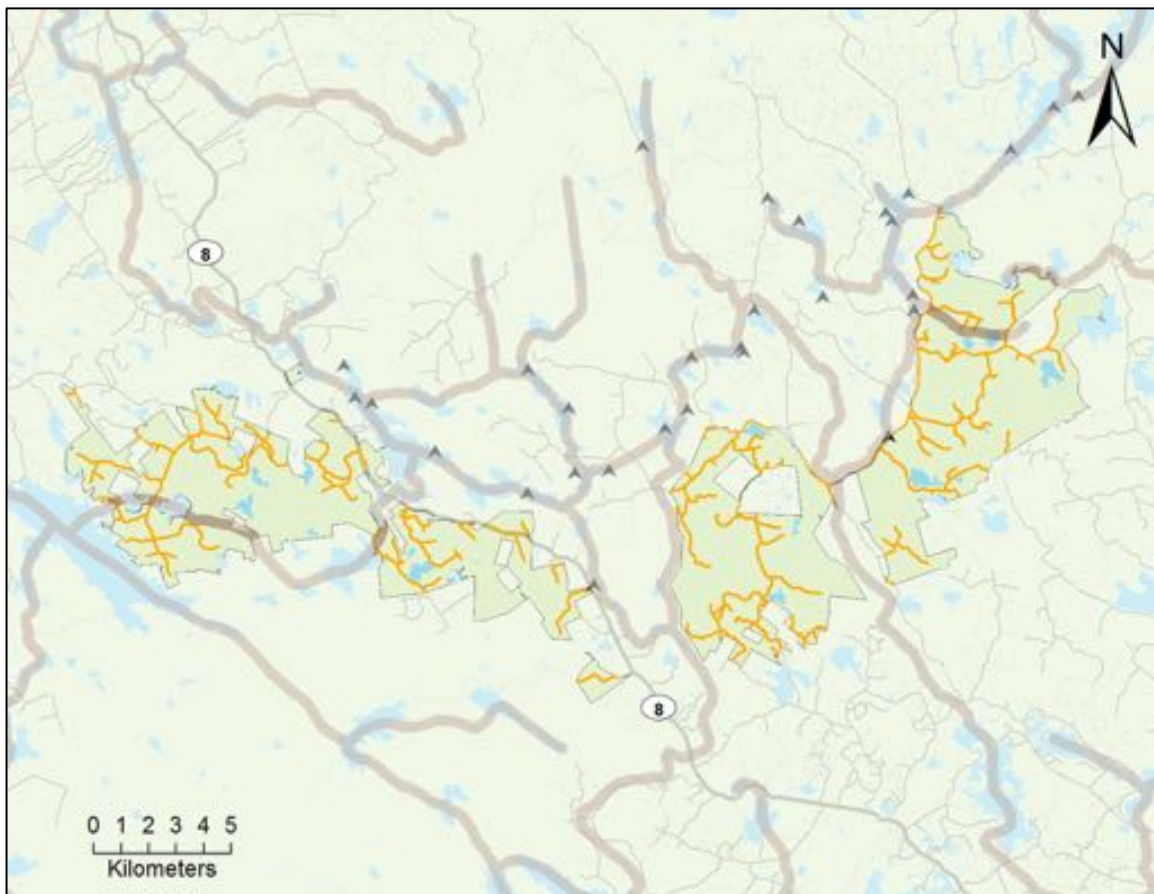


Figure 12 - Recreation Access Map: Canoe routes (transparent brown) and campsites (grey tent symbols) are based on information from Canoe Annapolis County guidebook and local knowledge. Woods roads (orange) do not include other off-road trails and are currently open for forestry operations.

²³ Based on Algonquin Park Management Plan (2002)

²⁴ Public access roads such as the Albany New / New Albany Rd., West Branch Rd., Victory Rd.



Landscape-Level Objectives and Strategies:

1. Maintain viewsapes for users:
 - a. Maintain a minimum 30m buffer along designated tourist routes (i.e. Highway 8), and lands adjacent to canoe routes, portages and campsites.
 - b. Viewsapes will be considered when planning harvests and road construction activity to minimize the visual impact along canoe routes, portages and campsites.
 - c. Leave variable width special management (no harvest) zones adjacent to Highway 8.

Engagement Strategy

The MCFC will establish a working group to manage and improve recreational opportunities with the MCFC landbase. The group will work to facilitate the following objectives and strategies:

- 1) To improve recreational opportunities within the MCFC:
 - a. Improve infrastructure for those using the MCFC and adjacent Protected Areas.
 - b. Develop permit system for higher-impact activities such as motorized vehicles.

Indicators:

- Percent of operating plans implemented that have had an IRM review.
- Percent of forest operations, in locations where portages are known to exist, where the portages were kept free of brush
 - o Where portages are identified on the operating plan map, ensure measures are paths are kept free of brush.
- Percent of forest operations in the vicinity of highways, designated tourist routes and along canoe routes that have visual impacts taken into account in operating plan development.
- Percent of recreation projects within adjacent protected areas that were planned in consultation with protected area managers.
- Modifications made to operating plans to ensure minimal impact on conservation values of protected areas.
- Percent of forest operations that have been planned in consultation with stakeholders.
- Percent of forest operations within the specified distances from dwellings and adjacent landowners where the owners were notified within minimum time limits.
- Opportunities to expand recreational access identified:
 - o Distance of new trails, improved infrastructure or portages.
 - o Assistance and support provided to community groups intent on using the MCFC land base for recreational activities.

Monitoring and Reporting:

- Compliance with requirements for modification of operations to reduce visual impact, consultation with protected area managers and notifications of adjacent landowners will be verified through compliance checklists for harvesting.
- Opportunities provided to recreation stakeholder groups to share local knowledge and participate will be recorded.



6. Wildlife and High Conservation Values

6.1 Biodiversity Rich Landscapes

Objective 9. Forest management practices will be designed and conducted to maintain or restore the natural range and structure of forest communities to benefit the wildlife species.

The MCFC is committed to protecting the ecological integrity of the land base. All areas that meet the requirements of Sustainable Forestry Initiative (SFI) Forest of Exceptional Conservation Value and the Forest Stewardship Council (FSC) High Conservation Value Forests (HCVF) have been identified within the Medway District Plan as Biodiversity Rich Landscapes (BRL). Measures will be established to protect the values associated with BRLs and will continue to be requirements of SOPs for all forest management activities. Examples of HCVF include “forest areas containing regionally or nationally significant concentration of biodiversity values and forest areas that are in or contain rare, threatened or endangered ecosystems”.

The intersecting BRL within the MCFC is the classified as the Medway Biodiversity Rich Landscape. The key feature of this landscape is the high concentration of old-growth forests including a variety of mixed Acadian Forest types. Additionally the area is representative of the full variety of ecosystem types, which make up the Fisher Lake Drumlins natural landscape (see Figure 2). The MCFC and the Medway Lakes Wilderness Area are also key areas for social values, including wilderness-canoeing waterways and is a very important brook trout habitat. The designation of the Medway BRL can be seen in Figure 13.

Landscape-Level Objectives and Strategies:

- 1) Connectivity between protected areas will be considered in determining the location of Forest Conservation Reserves and harvest prescriptions
- 2) Planning will be conducted in consideration of biodiversity features through mapping, aerial photography, inventory and ground-level analysis.
- 3) Within Biodiversity-Rich Landscapes, apply the following measures:
 - a. Favour restoration of natural conditions;
 - b. Conserve special biodiversity features;
 - c. Reduce road impacts;
 - d. Conserve old growth forests;
 - e. Foster connectivity of mature forest; and
 - f. Conserve wetland habitats.

Stand Level Objective:

The MCFC stand level objectives for HCVF are in development. Management criteria for specific ecosites and any amendments the MCFC will implement that differ from the NSDNR PTA program can be found in Appendix IV – Silvicultural Ground Rules.



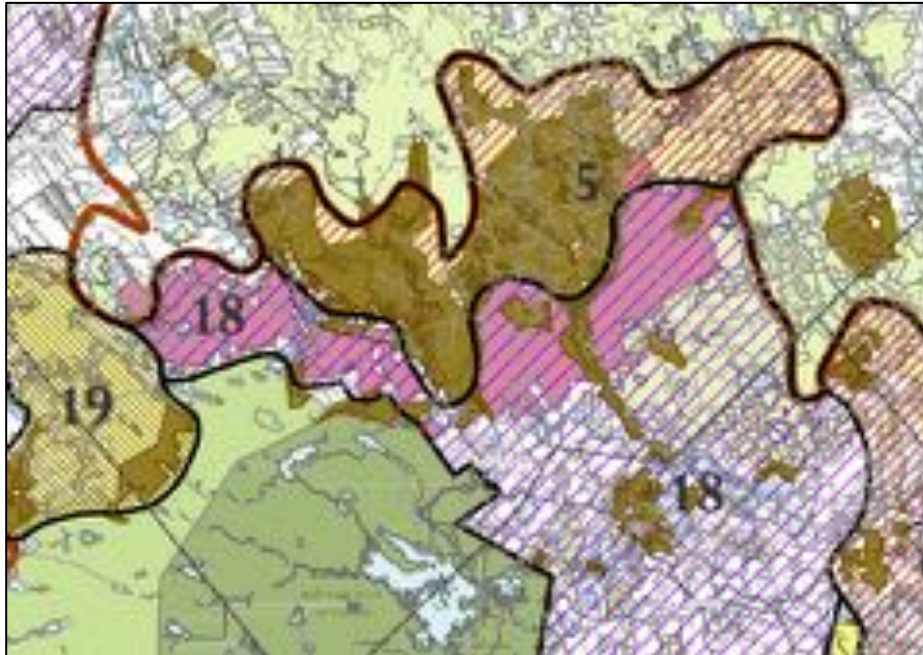


Figure 13 – Biodiversity-Rich Landscapes (BRLs): A small portion of the MCFC (represented in purple) falls under the Medway Biodiversity-rich landscape (5). The remainder of the area (18) is classified as having multiple values, therefore having the potential for economic, social and environmental benefits.²⁵

Indicators:

- Number of Forest Conservation Reserves and harvest prescriptions contributing to connectivity between protected areas and the conservation values buffer (500m of any Park and Protected Area boundary).
- Percent of harvest operations in compliance with requirements of treatment prescriptions.
- Number of openings larger than established maximum clearcut size and average size of all recent openings.

Monitoring and Reporting:

- Compliance with treatment prescriptions and Special Management Practices is verified through compliance checks and internal audits. Results of compliance checks are reported monthly. Results of internal audit and summary of compliance checks reported at the MCFC management plan review.
- The average clearcut size will be reported annually at the MCFC management plan review.

²⁵ NSDNR (2015)



6.2 Watercourses and Wetlands

Objective 10: Forest Management practices will be designed and conducted in a manner that maintains and enhances the quality of air, soil and water.

The MCFC land base supports an expansive network of rivers, streams and wetlands and shares borders with approximately 30 lakes. Two major fish bearing rivers, the Medway and the Mersey neighbour the MCFC land base and their health is vital for the maintenance of aquatic biodiversity in the area. All operations within the MCFC land base are subject to the standard requirements for Crown Lands including the Nova Scotia Wildlife Habitat and Watercourse Protection Regulations.

The requirement for buffers adjacent to clearcut harvests on watercourses wider than 50cm in Medway District is 30m. The Provincial Standard is 20m²⁶, which is the buffer requirement for partial harvests in the Medway District. The MCFC has chosen to adopt the 30m buffer for all harvests, on all watercourses wider than 50cm. Compliance with requirements and all measures taken to protect watercourses and wetland will be monitored through internal audits on all operations.

6.3 Species at Risk

Objective 11: Forest management practices will be planned and conducted to protect significant wildlife habitats in Nova Scotia Forest including habitat for species at risk.

The MCFC is home to several species at risk. Working in partnership with local organizations such as the Mersey Tobeatic Research Institute (MTRI) and ACCDC, MCFC is ensuring harvesting operations and recreational activities are occurring with minimal damage to the environment. There are several species at risk residing in the MCFC land base that NSDNR, ACCDC and MTRI have specified as requiring special management practices including:

- A. American Martin
- B. Eastern Moose (Mainland)
- C. Chimney Swift
- D. Common Nighthawk
- E. Olive-sided Flycatcher (Figure 14)
- F. Peregrine Falcon
- G. Rusty Blackbird
- H. Short-eared Owl
- I. Harlequin Duck
- J. Blanding's Turtle
- K. Eastern Ribbonsnake
- L. Wood Turtle

²⁶ Province of Nova Scotia (2009)



- M. Atlantic Salmon
- N. Monarch Butterfly

The full list of potential species at risk and the required management strategies outlined by NSDNR and the ACCDC are included in Appendix VI. For operations purposes, the ACCDC with consultation with additional wildlife researchers (The Mersey Tobeatic Research Institute [MTRI], Dalhousie University and Kejimikujik National Park) have created recommendations for the MCFC to use during harvesting operations. The SAR table, with operations recommendations can be found in Appendix VI.

The ACCDC has also identified areas that SAR could be found in the MCFC, which includes waterways where species are known to occur, along with directly connected waterways where it is not yet known whether a species occurs there or not. These sensitive areas are set for inclusion into Extensive Management Zones and are also considered a top priority for more SAR research and monitoring by local researchers and citizen scientists.



Figure 14: Olive-sided Flycatcher,
Audubon/Garth McElroy (2015)

SAR potential habitat includes areas along larger water bodies, and wetlands according to the Bowater forest inventory data. Large water bodies in the Mersey, Medway, and LaHave watersheds are known to provide habitat for federally-listed Atlantic Coastal Plain Flora (ACPF) and until surveyed, the MCFC will be cautious in any operations occurring within these habitats. One such ACPF, Sweet Pepperbush (*Clethra alnifolia*), is already known to occur on a lakeshore in the community forest; however, other water bodies have not been fully surveyed. Wetlands from the Bowater forest inventory are potentially home to SAR bird species such as Olive-sided Flycatcher (*Contopus cooperi*) (Figure 12), Canada Warbler (*Wilsonia canadensis*), and Rusty Blackbird (*Euphagus carolinus*). These species are known to occur throughout the community forest area, but more research is required to determine their specific location.

Habitat objectives for the MCFC have been determined with consideration of interior forest species, old forest dependent species and keystone/ indicator species as required by the FSC Maritime Standard. Indicator species include; common nighthawk, golden-crowned kinglet and American marten and were selected based on 1) Their affinity for distinct development stages, 2) federally and/or provincially listed status, 3) the breadth of forest structure and development stages encompassed.

Landscape-Level Strategy:

- All MCFC forest operations will be planned with consideration for protecting SAR and submitted to DNR for Integrated Management Review (IRM). The approval process includes a pre-screen for the presence of SAR. The pre-screen refers to various datasets including those presented by the ACCDC. DNR Regional Biologist will identify



measures to be taken to protect SAR where appropriate. Additionally the requirements of “DNR Special Management Practices for Species at Risk” will be implemented in areas where habitat for these species has been identified.

Indicator:

- Percent of forestry operation in compliance with requirements of IRM approval.
- No loss of SAR or SAR habitat.

Monitoring and Reporting:

- Percent of forestry operation in compliance with requirements of IRM approval will be monitored through compliance checks on all forest operations and reported annually.

6.4 High Conservation Value Forests

The High Conservation Value Forest (HCVF) Assessment of Medway District lands includes identification of “forest areas containing globally, regionally or nationally significant large landscape level forests”. The corridor of continuous forest cover, established by forest conservation reserves, has been designated as HCVF and restrictions on management activities have been established to ensure its conservation value is maintained.

According to the FSC Maritime Standard High Conservation Value Forest Assessment Framework²⁷, HCVF Forests possess one or more of the following attributes:

- i. Forest areas containing globally, regionally, or nationally significant:
 - a. Concentrations of biodiversity values (e.g., endemism, endangered species, refugia; and/or)
 - b. Large landscape level forests, contained within or containing the management unit, where populations of most (if not all) naturally occurring species exist in the natural patterns of distribution and abundance.
- ii. Forest areas that are in or contain rare, threatened, or endangered ecosystems
- iii. Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).
- iv. Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities’ traditional cultural identity (areas of cultural, ecological, economic, or religious significance identified in cooperation with such local communities (FSC Maritime Standard).

The HCVF in the MCFC are classified within the BRL designation. Although the Medway BRL only falls over a small portion of the MCFC land base, the intention is to recognize the special attributes of the neighbouring landscape and maintain diligence when planning operations on the entire land base.

²⁷ FSC Maritime Standard, 2008



Objectives and Strategies:

- 1) Maintain and improve biodiversity and wildlife habitat in the MCFC area.
 - a. Conservation of wetlands, tree bogs and areas designated as High Conservation Value Forests (HCVF).
- 2) Minimize the impacts of roads and timber harvesting on hydrological regimes.
 - a. Follow DNR SOP's for road layout and watercourse crossings. Look for opportunities to improve established SOP's.
- 3) Maintain and enhance the quantity of wildlife and legacy trees.
 - a. Enhanced logging prescriptions to maintain older, legacy trees and trees that possess special biodiversity characteristics.
 - b. Increase representation of old and mature forests, and maintenance of a full range of stand structure and ages, species and ecosystems.
- 4) Manage the forest land base to be compatible with the needs of wildlife, giving priority to species at risk
 - a. Residual structures remain in sufficient quantities and distribution to maintain ecological function following harvesting.
- 5) Identify and protect BRLs when planning and implementing forestry activities.
 - a. Ensure all harvested areas meet minimum standards for stocking of acceptable species.

Indicators:

- Number of licensees, contractors and their staff who have received environmental awareness and certification awareness training.
- Percent of operations in compliance with requirements of timber license/ agreement and Standard Operating Procedures.
- Number of non-conformances found during NSDNR and third party audits of SFI (or FSC if applicable) certification standards and MCFC management plan requirements.

Monitoring and Reporting:

- Compliance will be monitored through compliance checks and internal audit. Results of compliance checks reported at monthly. Results of internal audit and summary of compliance checks reported at MCFC management plan review.
- Third party audit of SFI (or FSC if applicable) requirements will be conducted annually through NSDNR with results reported upon completion and included in management review



7.0 Community Engagement

Objective 12: The Co-op will strive to support economic stability in local communities.

Objective 13: The Co-op will aim for a high level of business innovation through new product development, start-up ventures and community investment.

Objective 14: The organizational structure and planning processes are designed to cultivate a broad level of community collaboration.

Objective 15: Governance structures will have a high level of accountability and transparency to the community. Board of Director positions will be democratically elected from the membership.

As a community forest the MCFC is dedicated to a very high level of public participation in all management decisions. A fundamental belief built into the design of the MCFC is that the people who most closely rely on the forest that surrounds them are also the most likely to care for its long-term health.

Engagement Objectives:

The purpose of public engagement in the development and ongoing management of the MCFC is to give the community direct control over the landbase and to foster local economic benefit from its resources. To this end, the objective of the MCFC is to provide opportunities for the public to learn about issues related to management of forest lands, and participate in the development of management objectives and strategies.

The key principles for community engagement in the MCFC are based in a participatory leadership approach to governance. The foremost principle in doing so is transparency. All agreements, plans, and documentation for the MCFC are made publically accessible – with the exception of documents that contain information proprietary to a third party or include personal information of employees or contractors.

The next principle is inclusion. Anyone who declares an interest in the activities and decisions of the MCFC has full opportunity to participate. Inclusion does not, however, give any one person or group veto power over decisions, or the right obstruct the activities and decisions of the MCFC. Furthermore, it has been clear from the outset that there are multiple interests in the community forest, some of which may conflict, and that no one set of interests may dominate the decisions and direction of the MCFC. This principle is most clearly reflected in the Board of Directors governance structure, which stipulates a balanced representation of economic, social, environmental, and aboriginal interests.

Anyone who declares an interest in the activities and decisions of the MCFC has full opportunity to participate



Finally, participation follows a principle of consensus. In all MCFC meetings the organization will strive for consensus based decision-making. This holds as a principle for public meetings, stakeholder meetings, and regular meetings of the Board of Directors. If a consensus cannot be reached the first priority is to defer the decision until further information sharing and discussions provide the potential to achieve consensus. Only if a decision is particularly time sensitive or critical to ongoing operations, may the MCFC President call for a vote.

These principles are described in detail in the By-laws of the Medway Community Forest Co-operative Ltd. found on the MCFC website.²⁸

7.1 Structure and Activities

The engagement strategy for the MCFC is structured around a series of roles and levels of participation that is matched to the range of interests and responsibilities community members may hold in the activities of the MCFC. The MCFC engagement strategy includes the general public, direct stakeholders, shareholders/members of the Co-operative, the board of directors, and employees. Each group or level requires an appropriate level of engagement based on how they will be impacted by the decisions and activities of the MCFC as represented in Figure 15.

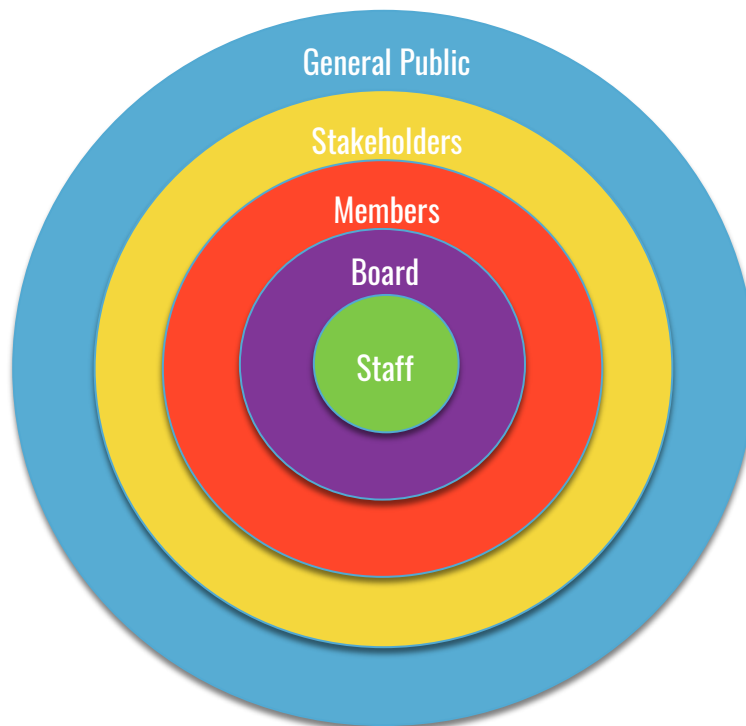


Figure 15 - Governance and responsibility structure within the MCFC

²⁸ www.medwaycommunityforest.com/mcfc-by-laws



General Public

General Public refers primarily to the citizens of Nova Scotia. As a Crown Land area, the people of Nova Scotia are the ultimate owners of the MCFC landbase. From this ownership, and as an intermediary for the landbase, the MCFC is responsible for the good stewardship of its resources. General public may also include a wider audience who hold some interest in the forest area or in the development of community forestry in general.

Engagement activities for the general public are focused on a strong communications strategy. Key elements of this activity are:

- An active and up to date website to share information (www.medwaycommunityforest.ca)
- An active Facebook page to share updates, build an interested audience, and invite participation
- A seasonal newsletter with direct distribution channels to provide updates and education value
- Presentations for partner organizations, and related public events
- Public events and field tours
- Open comment channel through the website, Facebook page, posted phone numbers and email for MCFC staff, and an open door policy at the MCFC office in Caledonia.
- Posting of the Draft Forest Management Plan and operational plans for harvesting and silviculture work on MCFC website for public comment and follow up on comments received.

Stakeholders

Stakeholders in the community forest are understood as groups or individuals who participate by representing a particular interest or set of interests beyond their personal view. Stakeholder representatives typically act as a conduit of information to and from a larger community. Stakeholders are also seen as a source of expertise, experience, and perspective that can directly contribute to and inform the decisions of the MCFC.

Key engagement activities for stakeholders are:

- A minimum of bi-annual stakeholder consultation meetings
- More frequent consultation meetings on key topics as needed
- Direct invitation to participate on MCFC committees
- Partnerships on key projects, events, and businesses

Members

Any shareholder of MCFC is considered a member. A shareholder may be an individual or an organization. Membership provides a direct decision making role in the activities of the MCFC. The Nova Scotia Cooperatives Act states that each member has one vote, regardless of the number of shares an individual or group may own. Members vote on the organization's key resolutions, may stand for election to the Board of Directors, elect the Board of Directors, and



hold the organization accountable to plans, objectives, and the requirements of the by-laws. As shareholders, members also have the opportunity to share in any benefits of the MCFC business activity. Membership requirements and benefits are described fully in the By-laws of the Medway Community Forest Co-operative Ltd.

Key engagement activities for members are:

- The annual general meeting of the membership
- Election to the Board of the Directors
- Participation on Board committees.
- Voting on key resolutions such as adopting financial reports and plans, management plans, key organization policies, and strategic plans

Board of Directors

MCFC Directors are elected during the Annual General Meeting of the membership to serve as the direct oversight and decisions making body for the organization. The Board of Directors consists of twelve seats for members with declared environmental, economic, social and Aboriginal interests (2 seats each, respectively), and 4 seats for members at large. In addition, the Department of Natural Resources has the right to appoint an ex officio observer to the Board under the terms of the FULA.

The Directors are elected for a term of three years, and terms are staggered so that a total of four seats are made open for election in each year. A Director may only sit on the Board for four consecutive terms. Director requirements and benefits are further described in the By-laws of the Medway Community Forest Co-operative Ltd.

Key engagement activities for Directors are:

- Regular meetings of the Board, to be held on quarterly basis at minimum
- Decision making authority on all business and governance decisions of the MCFC
- Oversight over Staff activities and plans
- To form and chair Board committees
- Eligible for election to the Executive of the Board
- A shared communication platform to host all board discussions and documents

Staff

The MCFC Staff have primary responsibility for the delivery of the plans and operations of the MCFC. Led and directed by the MCFC Manager, staff will each have a specific scope of work related to their position. The principles of Participatory Leadership are also to be reflected in the staff culture of the organization. The goal is to foster conditions for people to do their best work and to place decision making as close to the source of the information about that decision as possible.



Key engagement activities for the staff are:

- Weekly staff meetings
- Collaborative work planning
- Annual performance review
- Annual staff retreat
- Ongoing training and professional development
- Collaboration platform for open sharing of information and work documents
- Participation in member, stakeholder, and public engagement events to encourage direct communication of information inside and outside the MCFC
- Participation in committees.

Indicators:

- MCFC will track the opportunities provided to the public, stakeholders, members and staff to learn about issues related management of MCFC lands and participate in the development of management objectives and strategies. Included in the tracking will be an estimate of the number of groups or individuals that took advantage of these opportunities and the input received from them.
- Percent of forest operations that have been planned in consultation with stakeholders.
- Percent of forest operations within the specified distances from dwellings
- Percent of adjacent landowners that were notified within minimum time limits.
- The number of education and extension institutions that have made use of the MCFC landbase to provide learning opportunities associated with forest ecosystems and forest practices.

Reporting:

- A summary of activities related to the Engagement Strategy will be included in the MCFC Annual Report.

8. Mi'kmaq Relationship

Objective 16: Forest management plans will respect Aboriginal and Treaty Rights and ensure that the Mi'kmaq of Nova Scotia are provided with continued access for traditional activities (fishing, hunting, harvesting of wood for domestic purposes).

Objective 17: Forest Management plans will respect Mi'kmaq culturally important sites within the designated lands and provide the Mi'kmaq with continued access to those sites.

In order to properly advocate the participation of First Nations, the MCFC Board of Directors will hold two seats open for First Nations representatives. In addition to the guiding principles stated in Section 7, the MCFC recognizes that the community forest area is located on the undeeded territory of the Mi'kmaq. The Province of Nova Scotia, Canada and the Mi'kmaq entered into an Umbrella Agreement on June 7, 2002, in which all three parties recognized there



are outstanding constitutional rights issues amongst them, including Aboriginal rights and treaty rights.

The MCFC is committed to consulting the Mi'kmaq people on the development of economic opportunities, and ensuring culturally important sites within the land base will be respected. Section 35 of the Constitution Act, 1982, protects the existing Aboriginal and treaty rights of the Mi'kmaq, and the MCFC agrees that it will provide the Mi'kmaq with continued access, unless otherwise posted, to the community forest area for traditional activities (fishing, hunting, harvesting of wood for domestic purposes); and respect Mi'kmaq culturally important sites within the community forest and provide the Mi'kmaq with continued access to those sites. The Mi'kmaq have been invited to participate in interim management plan development to provide valuable insight regarding the social and cultural values found within the MCFC land base.

The importance of developing a relationship with the Mi'kmaq is vital to the success of the MCFC in the pilot phase, and in perpetuity. The MCFC will dedicate the time to develop a relationship with local, regional and provincial First Nations groups. The environmental philosophies used by the Mi'kmaq people have a vital role in the long-term management of forests in Nova Scotia. The MCFC will work to emphasize the integration of Traditional Ecological Knowledge within our management practices. Through information sharing, the MCFC also has the opportunity to provide insights to the Mi'kmawey Forestry Initiative as a fellow Crown Land manager and will work together on establishing fair and equal rights for organizations practicing sustainable forestry and stewardship on Crown Lands in Nova Scotia.

Objectives and Strategies:

- 1) Develop management objectives with Mi'kmaq stakeholders for the MCFC land base
- 2) Ensure opportunities for economic development and partnerships are provided to First Nations.
- 3) Assist with identification, regeneration and preservation of culturally significant species
- 4) Develop efforts to address concerns and help facilitate research with local Mi'kmaq partners on strategies for species at risk.

Indicators:

- Opportunities provided for the Mi'kmaq of Nova Scotia to share Traditional Ecological Knowledge.
- Opportunities provided for local groups, the Mi'kmaq of Nova Scotia and the public with an interest in hunting, fishing or trapping to participate in the development of SOPs.
- Percent of forest operations, in the vicinity of areas of significant cultural value, in compliance with measures developed to protect their unique features.
- Number of culturally important site identified within the MCFC.
- Opportunities provided for Mi'kmaq to participate in the development of management plans for the MCFC.



Monitoring and Reporting:

- Opportunities provided to stakeholders, the Mi'kmaq of Nova Scotia and members of the public to share ecological knowledge and participate are recorded.
- List of areas of cultural significance and percent of operation in compliance with requirements to protect their unique value will be monitored.
- Opportunities to participate in management plan development and benefits provided will be recorded.
- The number of sites of cultural significance identified on the MCFC landbase will be recorded in the IRM approval documents.

9. Roads and Access

Objective 18: Maintain safe, controlled access for the responsible use of MCFC lands by forest workers, stakeholder groups, and the general public.

A significant portion of the MCFC license area is accessible by passenger vehicle from Highway 8 and the Victory Road on un-gated forest roads. The portion of the license area in the interior of the Medway District is accessible by passenger vehicle from Albany New, South Milford and West Dalhousie (from which there are two points of access). All of those access points have gates that, from time to time, have been open for extended periods.

There are also several ATV/ OHV trails that access the MCFC land base.

The MCFC requires year round access to its license area to carry out its forest management activities (planning, operational layout, harvesting, road construction, silviculture) and host events related to community outreach and education. It also requires the ability to facilitate access by groups and individuals interested in the responsible use of MCFC license area for recreational activities, the harvest of non-timber forest products and other activities of benefit to local communities but are not directly controlled by the MCFC.

The MCFC also requires the ability to restrict access to all, or part, of the MCFC license area during periods of soft road conditions, in areas where there are active forestry operations, in areas where authority has been granted to a third party to conduct a specific activity and any other situation where access poses significant environmental and/or financial risk.

The varying access point locations, as well as no-access areas for the entire Medway District can be found online through NSDNR: (<http://novascotia.ca/land/western-land//access.asp>).

Objectives and Strategies:

- 1) Build access agreement with NSDNR.
- 2) Build access agreement with Nova Scotia Protected Areas for MCFC-facilitated public recreational use in the Medway Lakes Protected Area.



- 3) Develop areas for non-motorized recreation, and a road-use permits for motorized vehicles.
- 4) Proper communication, including notification system is established between MCFC and recreational users.
- 5) Reduce road use conflicts
 - a. Publish road use information (i.e. road work, harvesting operations) on MCFC website and use appropriate signage.
 - b. Place roads in locations that minimize negative impacts on water quality, habitat fragmentation, sensitive ecosystems and species at risk.
 - c. When necessary, a road closure strategy will be implemented depending on soil and weather conditions and active forest operations.

Indicators:

- Percent of new roads that are placed in location that provide efficient access but have minimized risk to the environment
- The amount the MCFC land base is being used by a variety of user groups
- Number of conflicts arising due between recreation users and forestry operations.
- Percent of local recreation groups made aware of the location of MCFC forestry operations.

Monitoring and Reporting:

- Forestry activities shared on social media, MCFC website and through seasonal newsletters are recorded.
- Percent of MCFC recreational users who are aware of ongoing forestry operations.
- List of environmental sensitivities provided to contractor prior to commencing road expansions.
 - o New road construction limited during Blanding’s Turtle nesting season.

10. Education and Research

Objective 19: Provide learning opportunities associated with forest ecosystems and forest practices.

As is the standard for the Medway District, the MCFC license area will be made available to education and extension institutions to provide learning and research opportunities. The MCFC will continue to promote the license area as a location for academic and public research for local naturalists and environmental groups. The MCFC can also provide an excellent opportunity for forest ecosystems and forest practices research, and will continue to pursue partnerships with private organizations, government and academia. With any ongoing research, the MCFC will provide technical support wherever necessary. Throughout the pilot phase, the Mi’kmaq of Nova Scotia will be invited to share traditional ecological knowledge in forest management plan development and NTFP business development.



Objectives and Strategies:

- 1) The MCFC will support ongoing collaboration with research organizations and/or subject matter experts.
- 2) Establish a list of research needs and prioritize ongoing projects according to the needs of the MCFC.
- 3) Accommodate pre-existing research projects that exist within the MCFC land base.
- 4) Develop new education opportunities based on disciplinary gaps, or priorities identified by the community and local woodlot owners.

Indicators:

- Established list of research needs and prioritized projects according to the needs of the research community.
- The number of educational and extension institutions that have made use of the MCFC to provide learning opportunities associated with forest ecosystems and forest management practices
- Opportunities provided for the Mi'kmaq of Nova Scotia to share traditional ecological knowledge.
- Ongoing research projects in the MCFC have been identified
- Percent of local researchers aware of the MCFC, and ability to use the land base for studies.
- Educational programs have been facilitated or supported by the MCFC.

Monitoring and Reporting:

- Communication with researchers is documented and opportunities are made public through circulation on the MCFC website, social media and through the MCFC newsletter.
- Percent of researchers who have been provided with the access and support needed to carry out projects.



Abbreviations and Terms of Reference

AAC (Annual allowable cut): Harvest level determined to be sustainable over at least 100 years.

ACCDC (Atlantic Canada Conservation Data Centre): An organization with a mission to provide objective data and expertise about species and ecological communities of conservation concern, including species at risk, and undertakes field biological inventories to support conservation related to decision-making, research, and education in Atlantic Canada.

ACPF (Atlantic Coastal Plain Flora): are a unique group of unrelated plants that are mainly restricted to the flat land along the Atlantic Coast from Florida to Nova Scotia (NS) called the "Atlantic coastal plain".

AGS (Acceptable Growing Stock): Trees that will make a sawlog quality stem in the future or is one now and will maintain or improve in quality by the time of the next harvest.

BMPC (Bowater Mersey Paper Company)

BRL (Biodiversity-Rich Landscapes): is a planning unit under the Western Crown Lands Conceptual Plan characterized by a breadth of species and ecosystems, including but not limited to species-at-risk. The dominant value is conservation. Although resource development can be undertaken in these areas, protection of biodiversity and habitats will guide management and resource extraction.

ELC (Ecological Land Classification): a mapping tool that identifies and describes areas of similar enduring physical attributes, based on features such as climate, elevation, topography, bedrock formation, and vegetation. Within the classification information is presented and mapped within a hierarchy where broad to specific levels of detail are presented on a series of scale dependant maps.

FEC (Forest Ecosystem Classification System): a tool that helps forest managers use ecosystem-based management. The methodology is developed through classification of forest vegetation types, soil types and ecosites.

FSC (Forest Stewardship Council): an international certification and labeling system dedicated to promoting responsible forest management of the world's forests. Functions as a third-party certification body to promote and endorse responsible forest management.

FULA (Forest Utilization License Agreement): an agreement between the Minister and typically, an owner of a wood-processing facility, for the purpose of ensuring the best possible utilization of the forest.

GIS (Geographic Information System): is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

GMT (green metric tonne): Freshly cut wood measurement unit.



HCVF: High-Conservation Value Forest. Forests that possess one or more of the following attributes:

- i. Forest areas containing globally, regionally, or nationally significant:
 - a. Concentrations of biodiversity values (e.g., endemism, endangered species, refugia; and/or)
 - b. Large landscape level forests, contained within or containing the management unit, where populations of most (if not all) naturally occurring species exist in the natural patterns of distribution and abundance.
- ii. Forest areas that are in or contain rare, threatened, or endangered ecosystems.
- iii. Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).
- iv. Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic, or religious significance identified in cooperation with such local communities (FSC Maritime Standard).

IRM (Integrated Resource Management): a decision-making process whereby all resources are identified, assessed and compared before land use or resource management decisions are made.

MCFC (Medway Community Forest Cooperative)

MTRI (Mersey Tobeatic Research Institute)

NSDNR (Nova Scotia Department of Natural Resources)

NTFP (Non-Timber Forest Products): Any product or service other than timber that is produced in forests.

PSP (Permanent Sample Plot): Randomly selected plots established across Nova Scotia to collect forest growth and mortality information.

PTA (Pre-treatment Assessment): A detailed analysis of any prospective stands prior to harvest. Includes information vital to developing harvest prescriptions including stand-level details through Forest Ecosystem Classification (FEC) and stand characteristics such as basal area, species, tree diameters, height, vigour, and existing regeneration.

SAR (Species at Risk): Legally recognized designation for species at federal and/or provincial levels that reflect varying levels of threats to wildlife populations. The four categories of risk are extirpated, endangered, threatened, and species of concern (NSDNR definition).

SFI (Sustainable Forestry Initiative): a voluntary forest certification program, founded in implementing unique fibre sourcing requirements to promote responsible forest management.

SOP (Standard Operating Procedures): Method to be used in performing a specific task.

UGS (Unacceptable Growing Stock): Trees that will not make sawlog quality stem in the future or has sawlog quality stem now but will degrade in quality before the time of the next harvest.



References:

Algonquin Provincial Park, 2002. Algonquin Provincial Park Management Plan.

Audubon/Garth McElroy 2015. Guide to North American Birds. Olive-sided Flycatcher, *Contopus cooperi*. Accessed online: <https://www.audubon.org/field-guide/bird/olive-sided-flycatcher>

British Columbia Ministry of Environment, Pacific Carbon Trust, Ministry of Forests, Lands and Natural Resource Operations, Ministry of Aboriginal Relations and Reconciliation & The Delphi Group, 2011. Protocol for the Creation of Forest Carbon Offsets in British Columbia.

Crossland, D. 2006. Defining a forest reference condition for Kouchibouguac National Park and adjacent landscape in eastern New Brunswick using four reconstructive approaches. MScF thesis, UNB, Fredericton, NB, 305 pp.

Forest Stewardship Council Canada. 2008. Certification Standards for Best Forestry Practices in the Maritimes Region FSC-STD-CAN-Maritimes-2008

Fraver, S., White, A.S., Seymour, R.S. 2009. Natural disturbance in an old-growth landscape of northern Maine, USA. *J. of Ecology*, vol. 97(2): 289-298.

Luyssaert, S., Detief Shulze, E., Borner, A., Knohl, A., Hessenmoller, D., Law, B.E., Clais, P., Grace, J., 2008. Old Growth Forests as Global Carbon Sinks. *Nature* 455: 213-215.

Lyons, R.D. 1826-1886. Great Britain, Parliament, Presented to both houses of Parliament by Command of Her Majesty, April 1885, Gov. Publications, ID 9_02008, 39 pp.

McLeod, R.R. 1903. Markland or Nova Scotia: It's history, natural resources, and native beauties. Markland Publ Co., Dept of Agriculture, Ottawa, 603 pp.

Mersey Tobeatic Research Institute, 2011. Guide to FSC Certification for Woodlot Owners in Nova Scotia.

Nova Scotia Department of Environment: Protected Areas Branch, 2002. Natural Landscapes of Nova Scotia: A Summary Report.

Nova Scotia Department of Natural Resources, 2015. Guidelines for Biodiversity-Rich Landscapes under the Western Crown Lands Conceptual Plan.

Nova Scotia Department of Natural Resources, 2012. Nova Scotia's Old Forest Policy Report, FOR 2012-4.

Nova Scotia Department of Natural Resources, 2011. The Path We Share, A Natural Resources Strategy for Nova Scotia 2011-2020.

Nova Scotia Department of Natural Resources, 2008. Nova Scotia's Code of Forest Practice, FOR 2008-1.



Nova Scotia Department of Natural Resources, 2008. Mapping Nova Scotia's Natural Disturbance Regimes.

Nova Scotia Department of Natural Resources, 2006. Ecological Land Classification for Nova Scotia

Nova Scotia Department of Natural Resources Forest Certification Steering Committee, 2015. Medway District Forest Management Plan

Nunery, J.S. & Keeton, W.S. 2009. Forest carbon storage in the northeastern United States: Net effects of harvesting frequency, post-harvest retention, and wood products. *Forest Ecology and Management* 259: 1363-1375.

Ponomarenko, E. 2009. Reconstruction of pre-historical and early historical forest fires in Kejimikujik National Park and Historic Site. Unpubl. report to Parks Canada, 110 pp

Province of Nova Scotia, 2009. Wildlife Habitat and Watercourse Protection Regulations. *Nova Scotia Forests Act*. Section 40, R.S.N.S. 1989, c. 179.

Seymour, R.A., White, A.S., deMaynadier, P.G. 2002. Natural disturbance regimes in northeastern North America-evaluating silvicultural systems using natural scales and frequencies. *Forest Ecol. and Mgt.* 155: 357-367.

Smith, T. 1835. Natural history of Nova Scotia. The magazine of natural history, Dec., vol. VIII:56, p. 641-662.

United Nations Convention on Biological Diversity, 2010. Ecosystem Approach: An Introduction. Accessed Online: <https://www.cbd.int/ecosystem/>



Appendix I: MCFC Forest Management Plan Objectives

Objective 1: Forest management practices will be designed and conducted to conserve and enhance the health and natural diversity of Nova Scotia’s forest ecosystems. The forest will be managed using ecologically based forest management to maintain, enhance, or restore healthy Acadian Forest conditions

Objective 2: Forest management practices will be conducted according to the Ecological Land Classification system for Nova Scotia.

Objective 3: Forest Management practices will recognize the contribution of protected and wilderness areas in preserving the natural forest heritage within Nova Scotia.

Objective 4: Forest management will be designed and conducted with consideration of potential effects of climate change and opportunities to maintain and enhance carbon sinks.

Objective 5: Forest management practices will be designed and conducted to consider structure and diversity elements required for the integration of public interests.

Objective 6: Forest management practices will be designed and conducted to improve productivity, quality and value of forests and forest products.

Objective 7: The land base will be managed to maximize multiple economic, social and environmental values. Forest management practices will be designed and conducted to balance the economic, cultural, social and environmental interests.

Objective 9: Forest management practices will be designed and conducted to maintain or restore the natural range and structure of forest communities to benefit the wildlife species.

Objective 10: Forest Management practices will be designed and conducted in a manner that maintains and enhances the quality of air, soil and water.

Objective 11: Forest management practices will be planned and conducted to protect significant wildlife habitats in Nova Scotia Forest including habitat for species at risk.

Objective 12: The Co-op will strive to support economic stability in local communities.

Objective 13: The Co-op will aim for a high level of business innovation through new product development, start-up ventures and community investment.

Objective 14: The organizational structure and planning processes are designed to cultivate a broad level of community collaboration.

Objective 15: Governance structures will have a high level of accountability and transparency to the community. Board of Director positions will be democratically elected from the membership.



Objective 16: Forest management plans will respect Aboriginal and Treaty Rights and ensure that the Mi'kmaq of Nova Scotia are provided with continued access for traditional activities (fishing, hunting, harvesting of wood for domestic purposes).

Objective 17: Forest Management plans will respect Mi'kmaq culturally important sites within the designated lands and provide the Mi'kmaq with continued access to those sites.

Objective 18: Maintain safe, controlled access for the responsible use of MCFC lands by forest workers, stakeholder groups, and the general public.

Objective 19: Provide learning opportunities associated with forest ecosystems and forest practices.



Appendix II: Ecological Land Classification and Natural Landscapes Definitions

Ecological Land Classification:

South Mountain Ecodistrict:

Land is underlain by granite and reaches a maximum elevation of approximately 250 metres above sea level. The predominant soils are well drained sandy loams that have developed on granite till. For the most part the soils are shallow, stony, and dry. Furthermore the landscape is dotted with large granite boulders, which restrict harvest operability, and in some cases limit stocking levels within forest stands. Even in areas where the soil drainage is imperfect to poor, the soils are usually coarse, textured, sandy loams. Approximately 7.5% of the Ecodistrict is comprised of lakes and rivers.

The climate consists of warm early springs and warm dry summers, which when combined with coarse textured shallow soils, creates periods in the growing season where moisture deficits can be significant. Winters are moderately mild, however, the Ecodistrict has the most significant snow accumulation in Western Nova Scotia due to the area's higher elevation.

Fire has played a dominant role in shaping the forests of this Ecodistrict and fire species such as white pine, red pine, and red oak occur on sites where the soils are well drained, as would be found on upper slopes and ridges. Tolerant hardwoods will also occupy the unburned sites on upper slopes and will include sugar maple, American Beech, yellow birch and red oak.

Eastern hemlock and red spruce were once common on mid slopes with relatively fertile soils. Past forest management practices have reduced the eastern hemlock component on these sites.

Repeated wildfires (both natural and anthropogenic) and a history of forest harvesting of varied intensity since European settlement in the 1600's has heavily influenced the composition of the MCFC land base. Large areas of red maple and white birch can be found in the Ecodistrict, with the expectation that if fire and other human caused disturbance were eliminated, these stands will eventually revert to the tolerant hardwood and softwood associations as characterized by the few remaining old growth examples in the Ecodistrict.

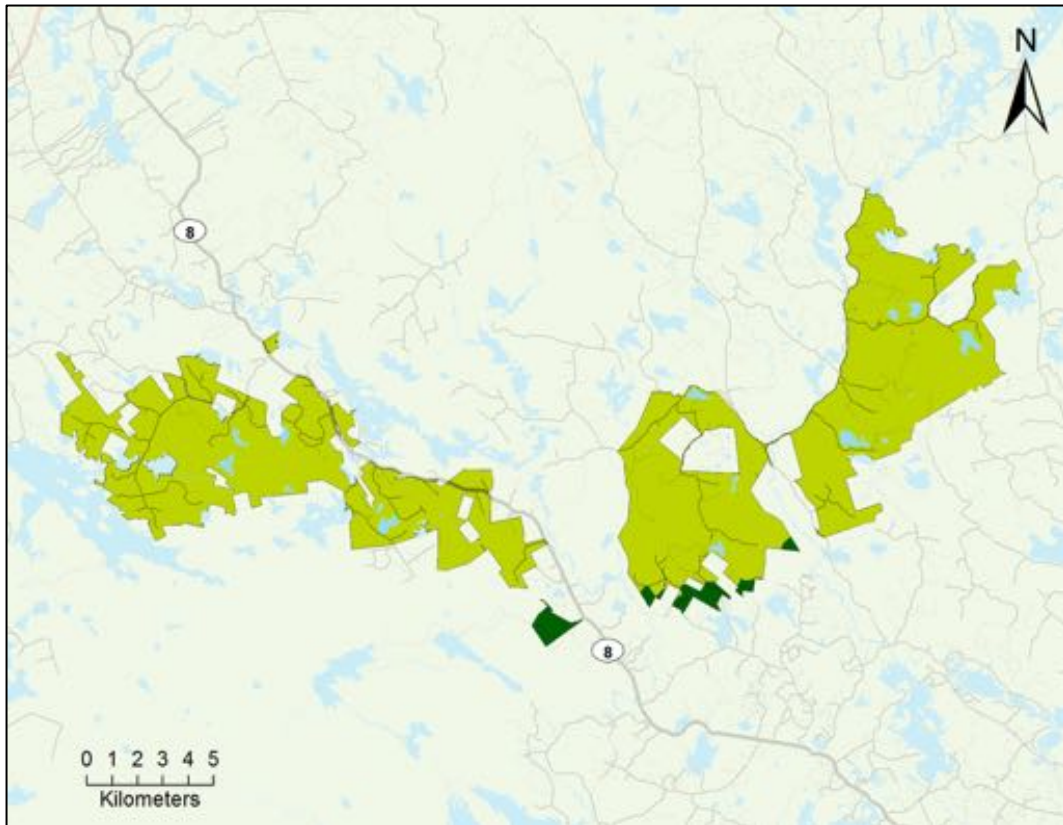
LaHave Drumlins Ecodistrict:

Shallow, stony till derived from the underlying slates dominate this Ecodistrict. Most of the soils can be characterized as well-drained, shallow, sandy loams except those developed on drumlins, which tend to be deeper and less stony. Much of the area between the drumlins tends to be shallow, imperfectly drained till with slate bedrock just below the surface. The terrain is considered hummocky with poorly drained soils in the depressions.

Coniferous forests dominate the LaHave Drumlins Ecodistrict, however tolerant hardwoods will be found on the tops of drumlins and on the upper slopes of well-drained hills. Sugar maple, red oak and American beech are also found on the valley floors of the major waterways. Eastern



hemlock, red spruce and white pine will be found on the side slopes of the drumlins and on the moist soils of lower slopes. Large areas of imperfectly drained soils occupy the areas between drumlins and, in most cases; forests of black spruce with white pine are dominant. After disturbance, balsam fir and white and grey birch is an early component of the coniferous forest in this Ecodistrict



Ecological Land Classification Map: The South Mountain Ecodistrict is depicted in lighter green and the LaHave Drumlins Ecodistrict is depicted in dark green.



Natural Landscapes:

Landscape 16 – Fisher Lake Drumlins⁵

A drumlin plain characterized by predominantly Acadian coniferous forest on undulating terrain and drumlins. Drainage is dendritic and consists of the upper reaches of several rivers and scattered lakes. Dominant ecosystems include well drained red spruce – eastern hemlock - white pine undulating terrain with patch/infrequent stand initiating natural disturbance regime, and well drained red spruce - eastern hemlock - white pine (sugar maple, yellow birch, American beech) drumlins with patch/infrequent stand initiating natural disturbance regime.

Landscape 7 – South Mountain Rolling Plains⁵

A southwardly inclined and resistant upland plain characterized by a variety of glacial deposits and dominated by Acadian coniferous forest. Often composed of well drained and undulating terrain, including poorly drained flats. Includes headwaters and middle reaches of rivers. Dominant ecosystems include well drained red spruce - - eastern hemlock (red oak) undulating terrain with patch/infrequent stand initiating/frequent stand initiating/stand maintaining natural disturbance regime, and poorly drained black spruce - larch flats with infrequent stand initiating natural disturbance regime.

Landscape 15 – LaHave Drumlins²⁹

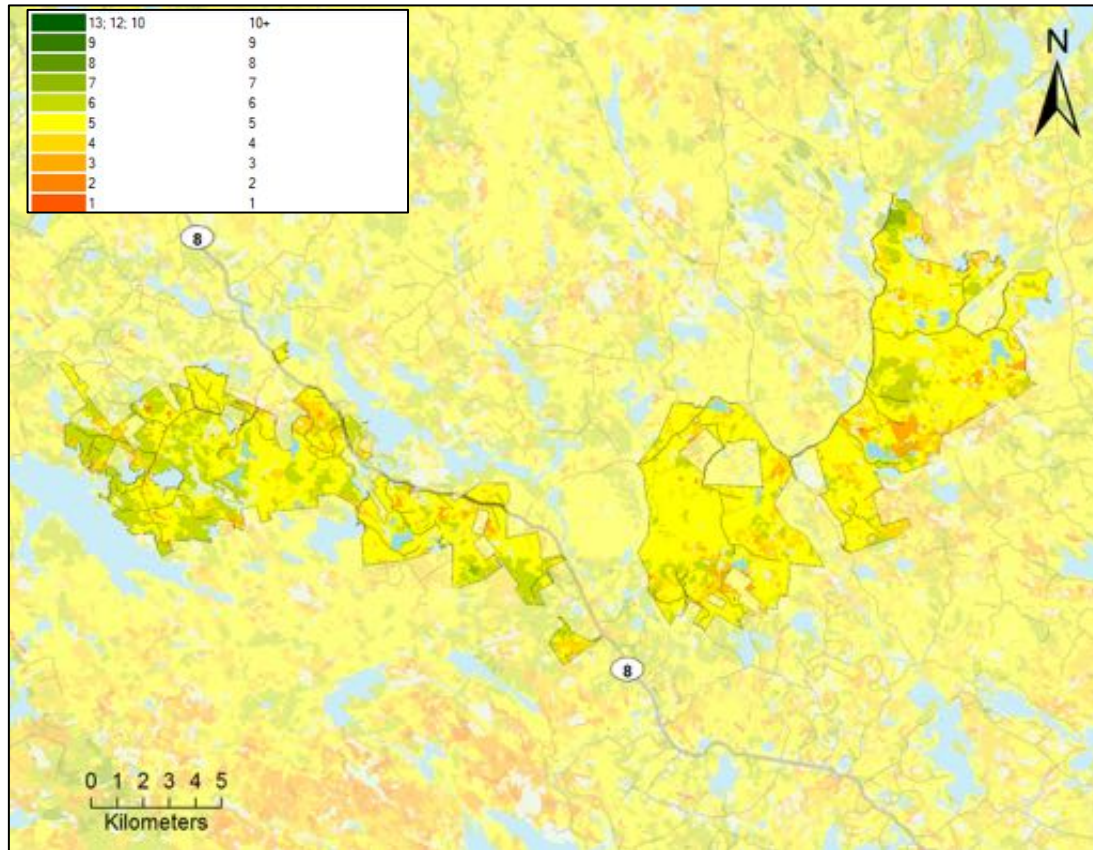
A drumlin field superimposed on a hummocky to flat gently tilted plain, and characterized by Acadian mixed forest types. Drainage is dendritic and is defined by many lakes and waterways. Dominant ecosystems include well drained sugar maple - yellow birch - American beech (red spruce, eastern hemlock, white pine, red pine) drumlins with gap natural disturbance regime, and well drained red spruce - eastern hemlock - white pine undulating terrain with patch/infrequent stand initiating natural disturbance regime.

^{5,6} Protected Areas Branch, Nova Scotia Department of Environment and Labour (2002)



Appendix III – MCFC Land Capability and Terrain Limitations

A. Land Capability for Softwoods – NSDNR Forest Inventory



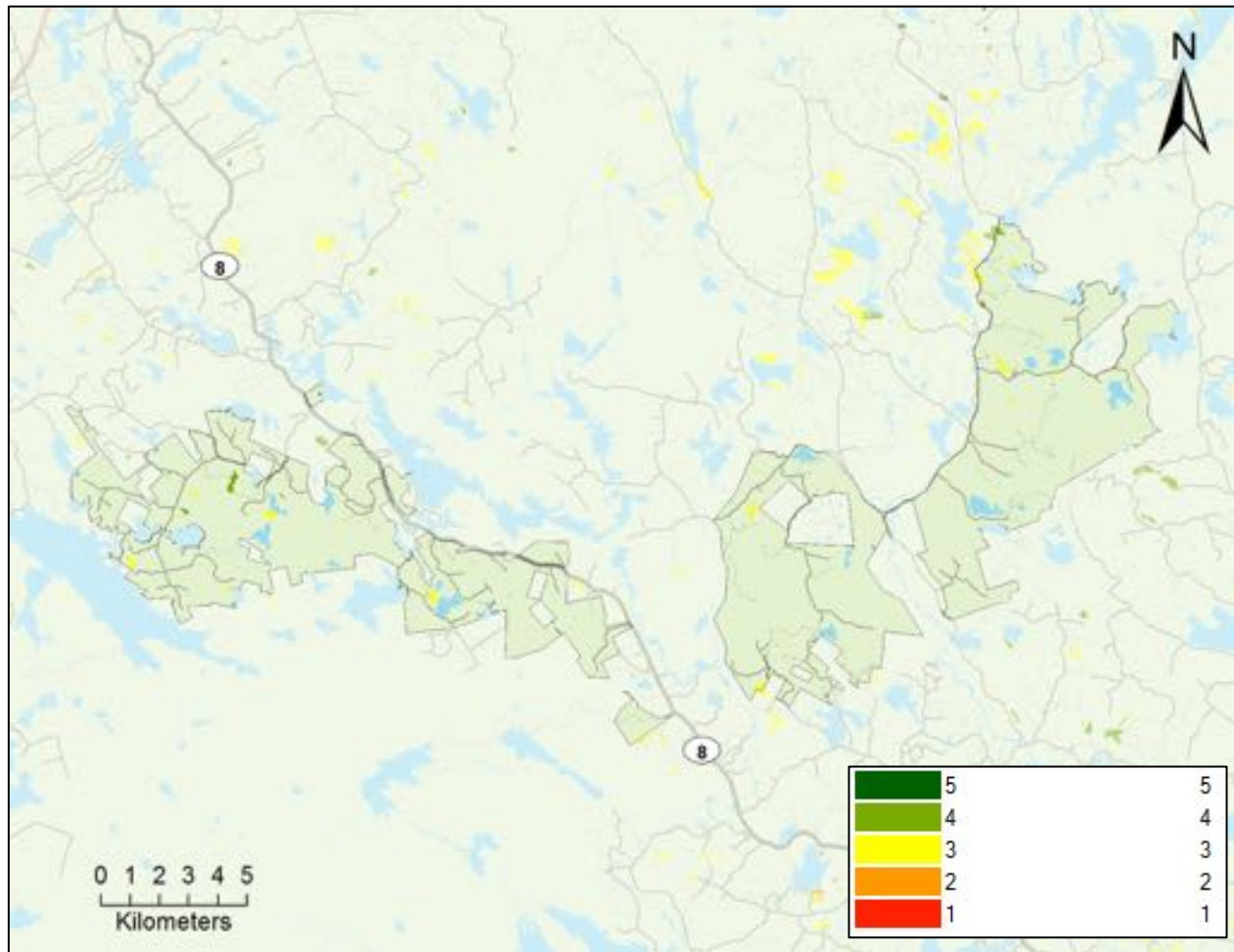
Softwood Land Capability: Green indicates more productive stands, while orange indicates less productive stands, with yellow indicating moderately-productive stands.

Field Names: SITE_SW, SITE_HW

	Softwood: Values of 1 - 13 indicating cubic meters per hectare, per year.
0	Less than 0.5 cubic meters per hectare, per year.
1	0.6 to 1.5 cubic meters per hectare, per year.
2	1.6 to 2.5 cubic meters per hectare, per year.
3	2.6 to 3.5 cubic meters per hectare, per year.
4	3.6 to 4.5 cubic meters per hectare, per year.
5	4.6 to 5.5 cubic meters per hectare, per year.
6	5.6 to 6.5 cubic meters per hectare, per year.
7	6.6 to 7.5 cubic meters per hectare, per year.
8	7.6 to 8.5 cubic meters per hectare, per year.
9	8.6 to 9.5 cubic meters per hectare, per year.
10	9.6 to 10.5 cubic meters per hectare, per year.
11	10.6 to 11.5 cubic meters per hectare, per year.
12	11.6 to 12.5 cubic meters per hectare, per year.
13	12.6 to 13.5 cubic meters per hectare, per year.



B. Land Capability for Hardwoods – NSDNR Forest Inventory

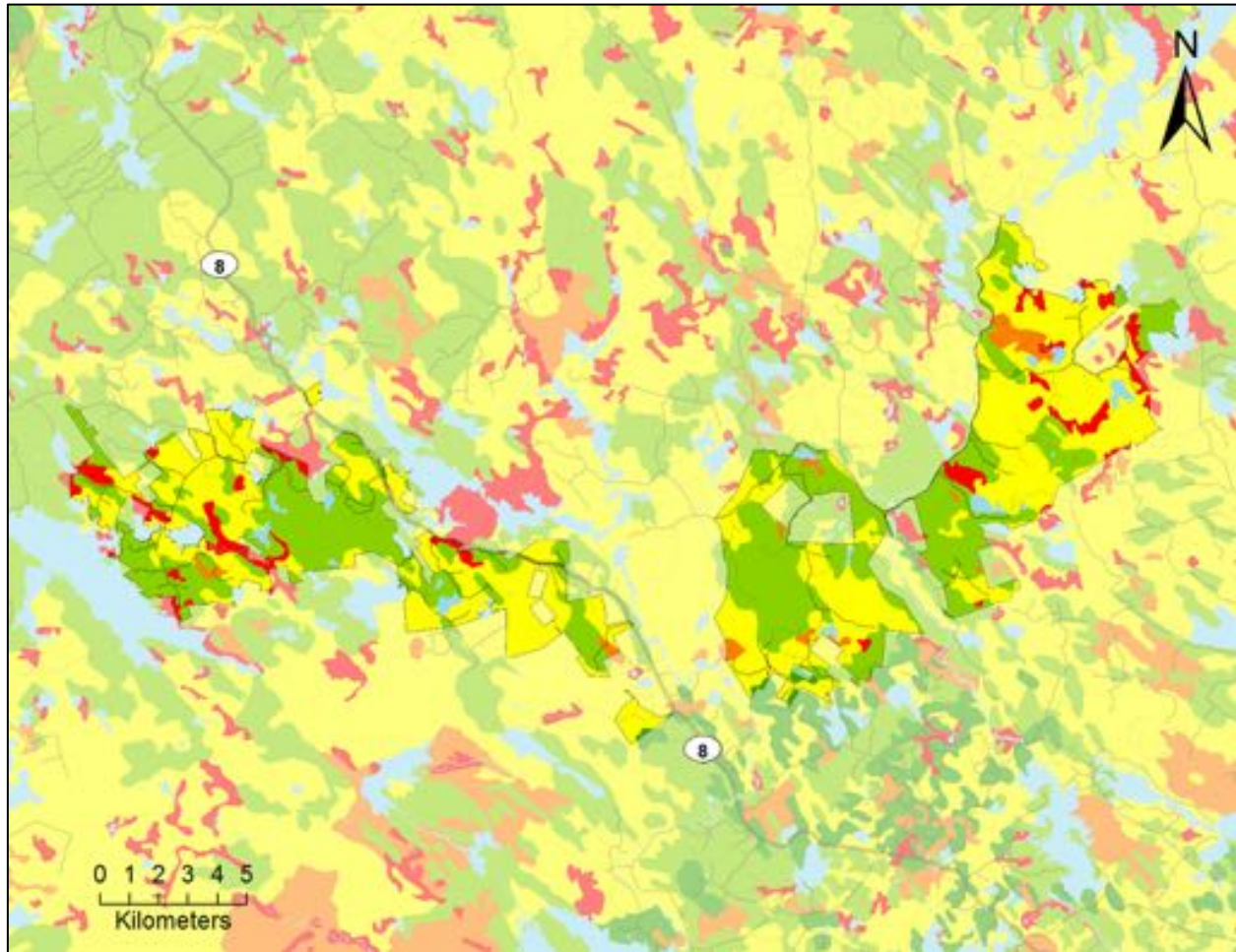


Hardwood Land Capability: Green indicates more productive stands, while orange indicates less productive stands, with yellow indicating moderately-productive stands.

Hardwood: Values 1 - 5 indicating cubic meters per hectare, per year.	
0	Less than 0.5 cubic meters per hectare, per year.
1	0.5 to 1.4 cubic meters per hectare, per year.
2	1.5 to 2.4 cubic meters per hectare, per year.
3	2.5 to 3.4 cubic meters per hectare, per year.
4	3.5 to 4.4 cubic meters per hectare, per year.
5	4.5 to 5.5 cubic meters per hectare, per year.



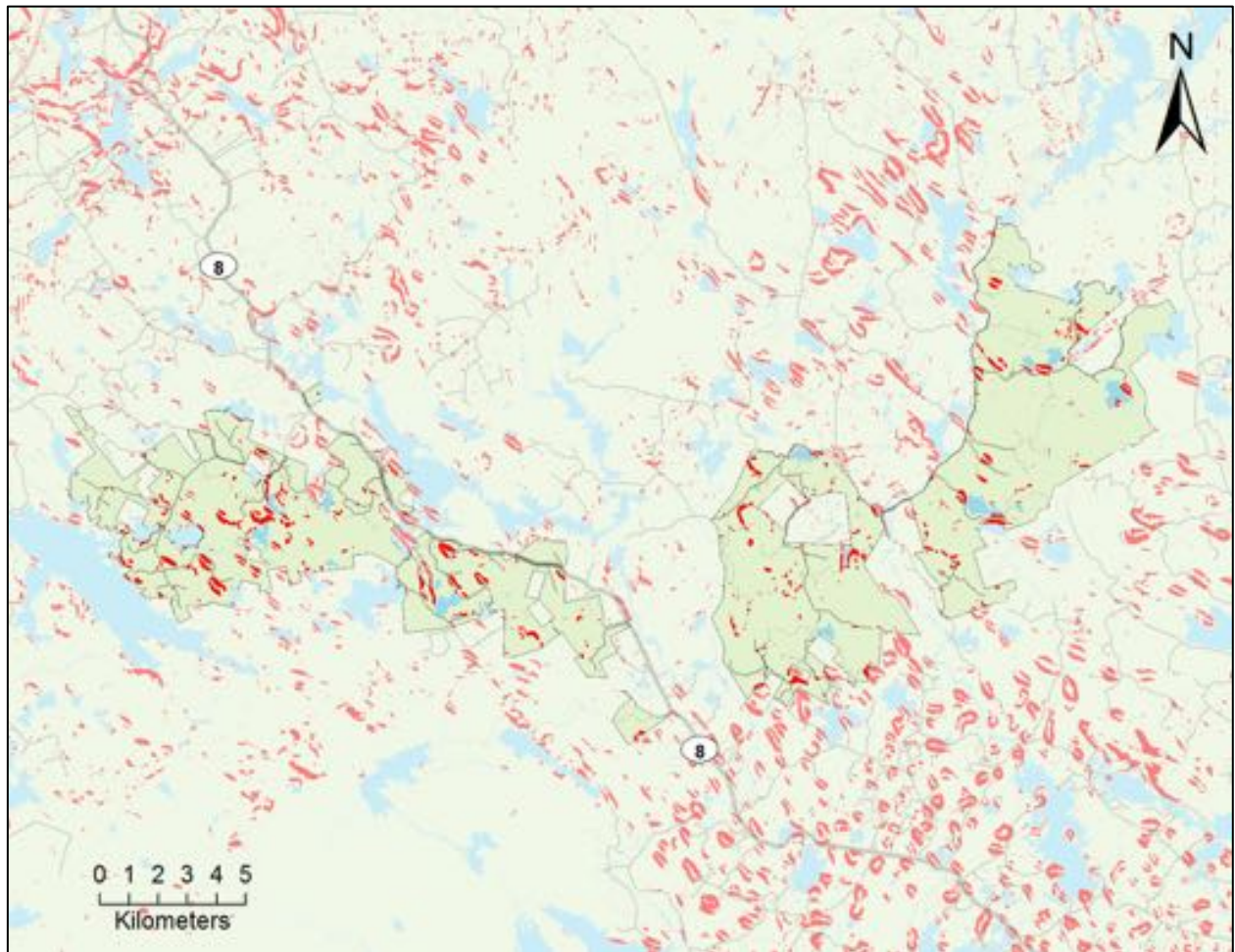
C. Land Capability based on Canada Land Inventory



Canada Land Inventory: Created from 1963 to 1994 the Canada Land Inventory provide a basis for land use planning by determining land capabilities for wildlife, recreation, agriculture and forestry. The map exhibits generally lower volume values (5-15%) compared to NSDNR land capability values.



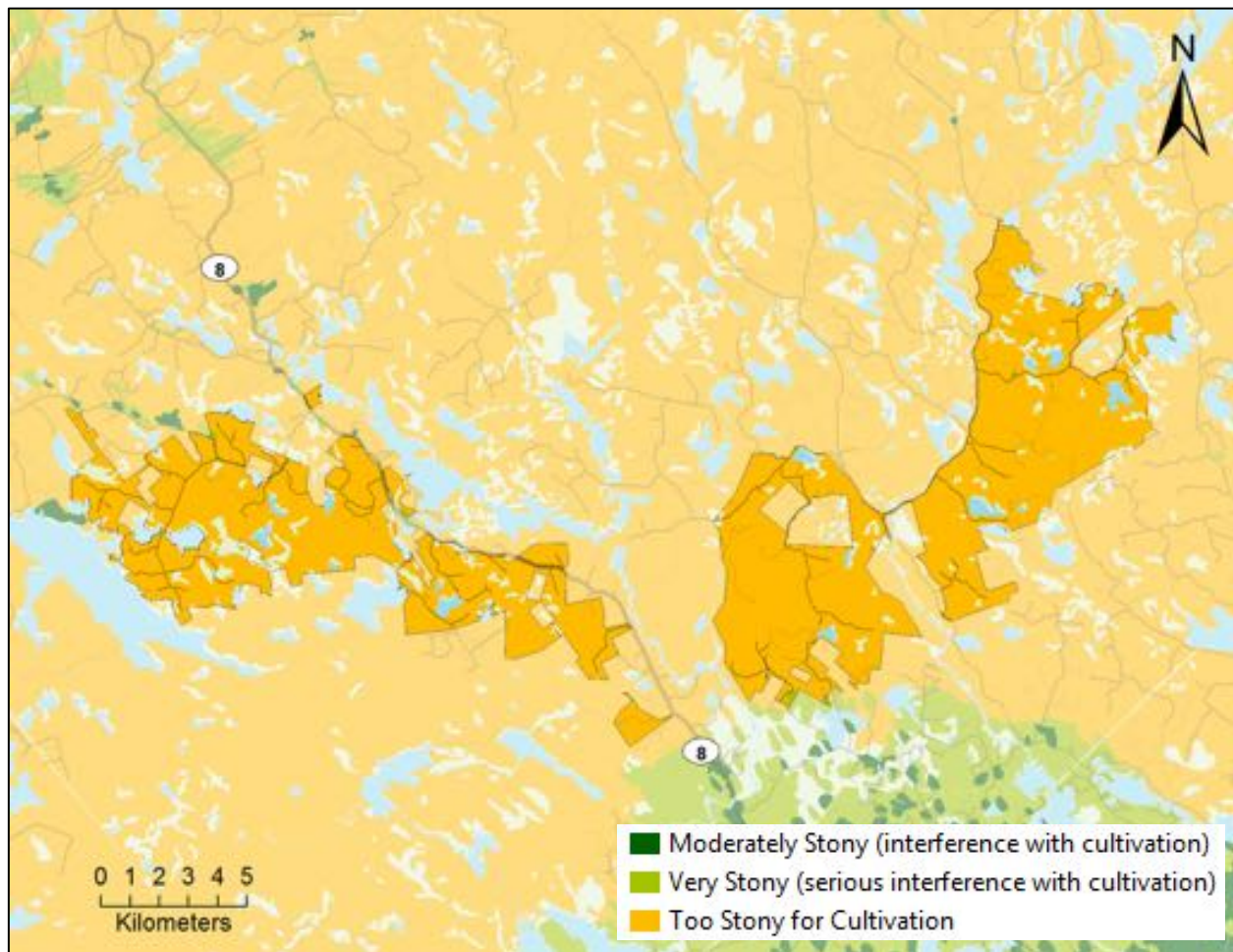
D. Terrain Limitations – Steep Slopes



Steep Slopes: Red areas indicate slopes greater than 10%, which may pose issues in forestry operations.



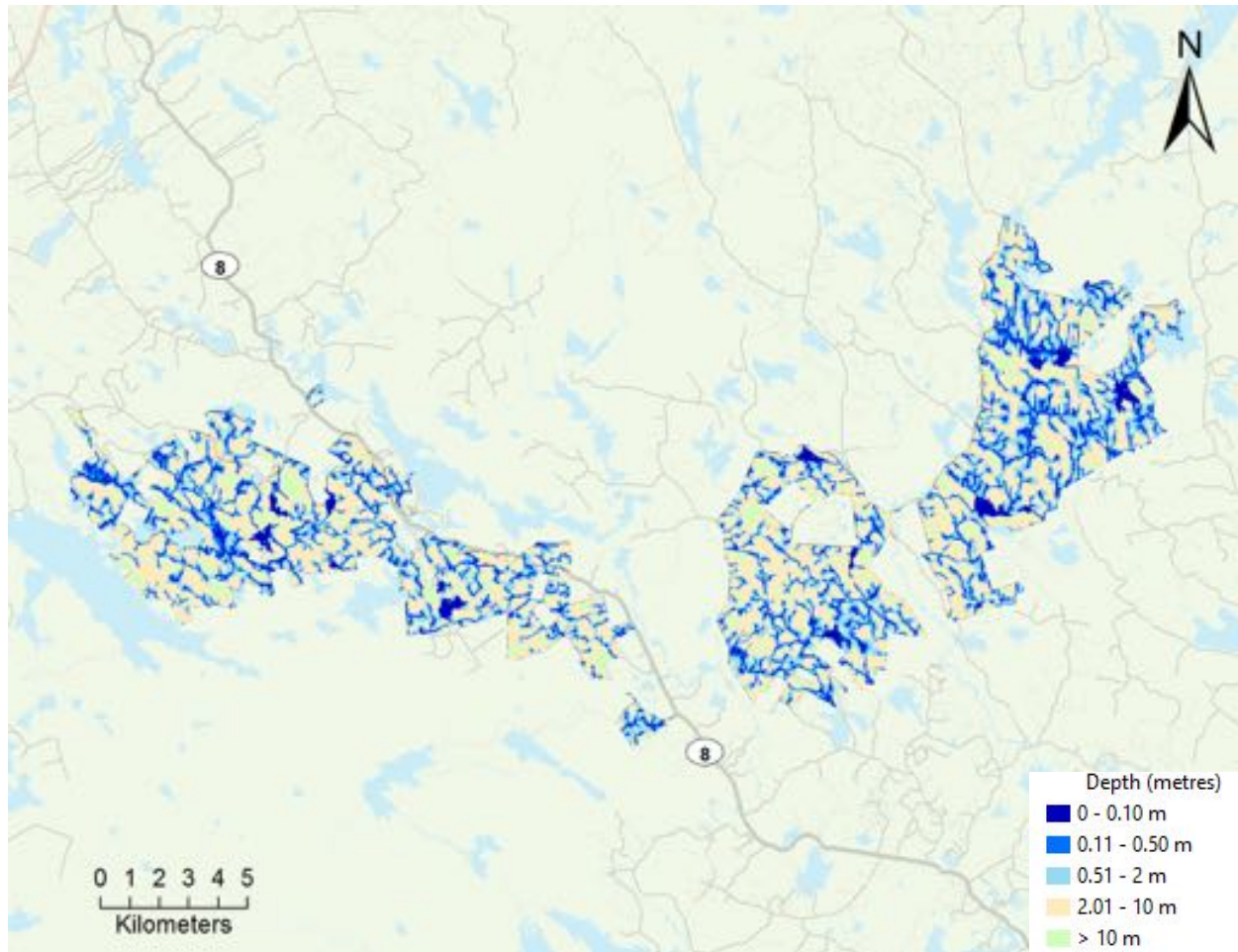
E. Terrain Limitations - Surface Stoniness



Surface Stoniness: Based on the Nova Scotia Soil Survey, the MCFC area is generally too stony for cultivation and would not be suitable for agriculture.



F. Terrain Limitations – Wet Areas



Wet Areas: Based on Wet Areas Mapping (WAM)³⁰ a layer that estimates the depth to the water table. Generally, the two darker blue colours suggest the potential for saturated soils that may inhibit site capability

³⁰ (<http://novascotia.ca/natr/forestry/gis/wamdownload.asp>)



Appendix IV – Silvicultural Ground Rules for Timber Harvests in the MCFC

Vegetation Types	Development Stage	Successional Pathway	Treatment Options from DNR Key	Considerations for Prescription	Adopt? Adapt? Drop?	MCFC Management Modification
SH2 - Hemlock-White pine/Sarsaparilla	Early	Development of uneven-aged or all aged structure	Crop tree release, Commercial thinning, Single tree selection		Adapt	Early entries may introduce small patch/gap removals in clumps of intolerant species to promote age class diversification.
	Late	Climax	Single tree selection, shelterwood or overstory removal, patch mosaic, or strip cut options.	Amount of AGS, windthrow hazard and sensitivity, soil stoniness are all factors to consider in selecting partial cut	Adapt	If uneven aged structure is established no overstory removal option. MCFC will tolerate a higher level of windthrow and UGS in favour of maintaining uneven-aged and more mature structural conditions. HCV and NTFP may further restrict the use of regeneration cuts. The goal is to increase the presence of late seral stage forests on the landscape.
SH3 - Red Spruce-Hemlock/Wild lily-of-the-valley	Early	Increasing uneven aged structure	Crop tree release, Commercial thinning, Single tree selection		Adapt	Early entries may introduce small patch/gap removals in clumps of intolerant species to promote age class diversification.



SH3 - Red Spruce-Hemlock/Wild lily-of-the-valley (continued)	Late	Climax	Single tree selection. Shelterwood or overstory removal, patch mosaic, or strip cut options.	Amount of AGS, windthrow hazard and sensitivity, soil stoniness are all factors to consider in selecting partial cut	Adapt	If uneven aged structure is established no overstory removal option. Will tolerate a higher level of windthrow and UGS in favour of maintaining uneven-aged and more mature structural conditions. HCV and NTFP may further restrict the use of regeneration cuts. The goal is to increase the presence of late seral stage forests on the landscape.
SH4 - Red Spruce-White pine/Lambkill/Bracken	Mid	Development of uneven-aged or all aged structure	Crop tree release, Commercial thinning		Adopt	Early entries may introduce small patch/gap removals in clumps of intolerant species to promote age class diversification.
	Late	Climax	Group selection, Shelterwood, seed tree	Amount of AGS, windthrow hazard and sensitivity, treated in the past, soil stoniness are all factors to consider in selecting partial cut	Adapt	If uneven aged structure is already established seed tree harvests are not to be used. Seed tree option is only to be used if volume/ha is below an acceptable stocking and windthrow makes shelterwood unsuitable.
SH5 - Red Spruce-Balsam Fir/Schreiber's moss	Early	Increasing uneven aged structure	Commercial thinning		Adapt	Early entries may introduce small patch/gap removals in clumps of balsam fir and other intolerant species to promote age class diversification.



SH5 - Red Spruce-Balsam Fir/Schreiber's moss (continued)	Mid	As uneven aged structure develops more gap dynamics stand will transition to SH2 or SH3 or SH4	Single tree selection, Group selection, Shelterwood, overstory removal	The percentage of balsam fir, windthrow hazard, past treatments are all factors to consider in selecting partial cut	Adapt	If uneven aged structure is already present overstory removal is not an option. Intensity of harvest is based on the percentage of mature balsam fir. Maintaining structure to foster later serial stages is the priority
SH6 - Red Spruce-Balsam Fir/Stair step moss-sphagnum	Early	Increasing uneven aged structure	Commercial thinning		Adapt	Early entries may introduce small patch/gap removals in clumps of balsam fir and other intolerant species to promote age class diversification.
	Mid	Uneven aged to gap = SH2 or SH3 or SH4	Single tree selection, Patch cut, overstory removal	The percentage of balsam fir, windthrow hazard, past treatments are all factors to consider in selecting partial cut	Adopt	
SH9 - Balsam Fir - Black spruce/ Blueberry	Early	Increasing uneven aged structure	Commercial thinning		Adopt	
	Mid	Uneven aged to gap = SP4 or SP5 or SH4	Overstory removal	Presence of advanced regeneration of more long live softwoods	Adopt	
SP3 - Red Pine - White pine/Bracken-Mayflower	Early	Even aged to uneven	Commercial thinning		Adopt	
	Mid	Uneven aged with increase in wP = SP4	Group selection, Shelterwood, seed tree	AGS and wind firmness	Adopt	
SP4 - White	Early	Even aged	Commercial thinning		Adopt	



pine/Blueberry/Bracken	Mid	Even aged to patchy uneven	Shelterwood, seed tree, overstory removal		Adopt	
SP6 - Black spruce-Red Maple/Bracken-Sarsaparilla	Early	Even aged	Commercial thinning		Adopt	
	Mid	Even aged to uneven = SP4	Overstory removal		Adopt	
SP8 - Black spruce-Aspen/Bracken-Sarsaparilla	Early	Even aged	Commercial thinning		Adopt	
	Mid	Even aged to uneven = SP9	Overstory removal		Adopt	
SP9 - Red oak-White pine/Teaberry	Mid	Even aged	Crop tree release, Commercial thinning			
	Late	Even aged to uneven	Shelterwood, seed tree, overstory removal	Amount of AGS, windthrow hazard and sensitivity, soil stoniness	Adapt	Strong preference for shelterwood option. Higher tolerance for UGS in favour of maintaining mature stand structure to foster higher quality regeneration.
MW2 - Red spruce-Red maple-White birch/Goldthread	Early	Even aged to uneven	Crop tree release, Commercial thinning		Adopt	
	Mid	Uneven to gap = SH3	Group selection, single tree selection, overstory removal	Amount of AGS, windthrow hazard and sensitivity, soil stoniness	Adopt	
MW4 - Balsam fir - Red maple/Wood sorrel-Goldthread	Early	Even aged to uneven	None		Adopt	
	Mid	Uneven to gap = SH5	Patch cut, overstory removal		Adopt	
MW5 - White birch-Balsam fir/Starflower	Early	Even aged to uneven	None		Adopt	
	Mid	Uneven to gap = SH5 or SH6	Patch cut, overstory removal		Adopt	
IH1 - Large-	Early	Even aged	None		Adopt	



tooth aspen/Lambkill/ Bracken	Early	Even aged to uneven = IH2 or SP9 or SH4	Overstory removal		Adopt	
IH2 - Red oak - Red maple/Witch-hazel	Mid	Uneven aged	Crop tree release		Adopt	
	Late	Climax	Shelterwood		Adopt	
IH4 - Trembling aspen/ Wild raisin/ Bunchberry	Early	Even aged	None		Adopt	
	Mid	Even aged to uneven = SH5	Overstory removal		Adopt	
IH6 White birch- Red maple/ Sarsaparilla/ Bracken	Early				Adopt	
	Mid		If enough yellow birch, sugar maple in the stand consider group selection		Adopt	
IH7 - Red maple/Hay-scented fern- Wood sorrel	Early	Even aged	None		Adopt	
	Mid	Even aged to uneven = TH6	Patch cut, Shelterwood, overstory removal		Adopt	
TH5 - Beech/ Sarsaparilla/ Leaf litter	Mid	Uneven aged	Crop tree release		Adopt	
	Late	Climax	Single tree selection	Aim for group selection to promote more yellow birch. Leave yellow birch, sugar maple seed trees	Adopt	
TH6 - Red oak- Yellow birch/ Striped maple	Mid	Uneven aged	Crop tree release		Adopt	
	Late	Climax	Single tree or group tree selection		Adopt	
WC1 - Black spruce/	Mid	Site limited - Climax	None		Adopt	

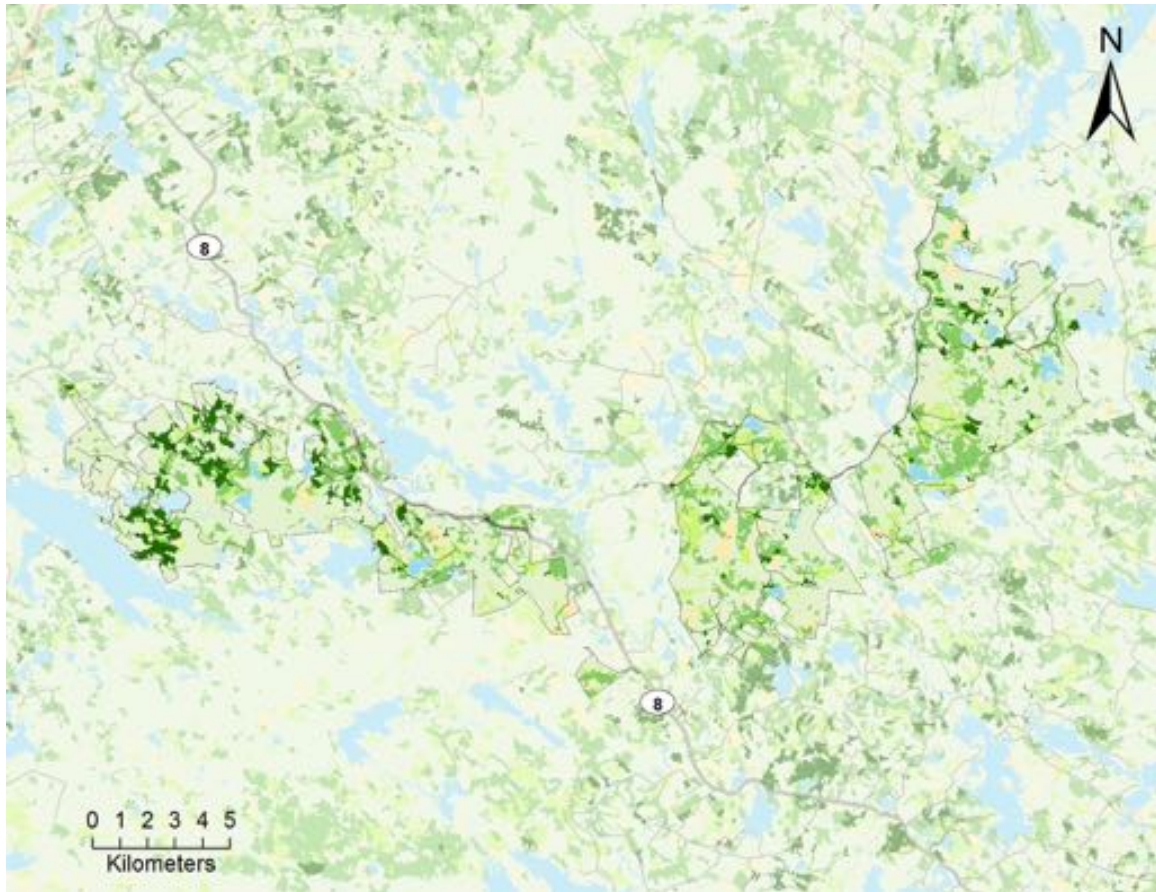


Cinnamon fern/ Sphagnum	Late	Site limited - Climax	No management or overstory removal	% of merchantable volume	Adapt	No harvest due to site sensitivity and low merchantable volume
WC6 - Balsam fir/Cinnamon fern-Three seeded sedge/ Sphagnum	Early	Even aged	None		Adopt	
	Mid	Even aged to uneven = WC8	Patch cut, overstory removal	% Of merchantable volume	Adapt	No harvest due to site sensitivity and low merchantable volume
WC8 - Hemlock/ Cinnamon fern- Sensitive fern/ Sphagnum	Mid	Uneven aged	None		Adopt	
	Late	Climax	Single tree or group tree selection	% Of merchantable volume	Adopt	
WD2 – Red maple/ Cinnamon fern/ Sphagnum	Early	Uneven aged	None		Adopt	
	Mid	Climax	No management		Adopt	
WD4 - Red maple/Poison ivy/Sphagnum	Mid	Uneven aged	None		Adopt	
	Late	Climax	Single tree or group tree selection		Adapt	No harvest due to site sensitivity and low merchantable volume
WD7 - Balsam fir-White ash/Cinnamon fern-New York fern/Sphagnum	Early	Uneven aged	None		Adopt	
	Mid	Climax	No management or patch cut	% Of merchantable volume	Adapt	No harvest due to site sensitivity and low merchantable volume



Appendix V: Non-Timber Forest Products

B. Fir Tipping

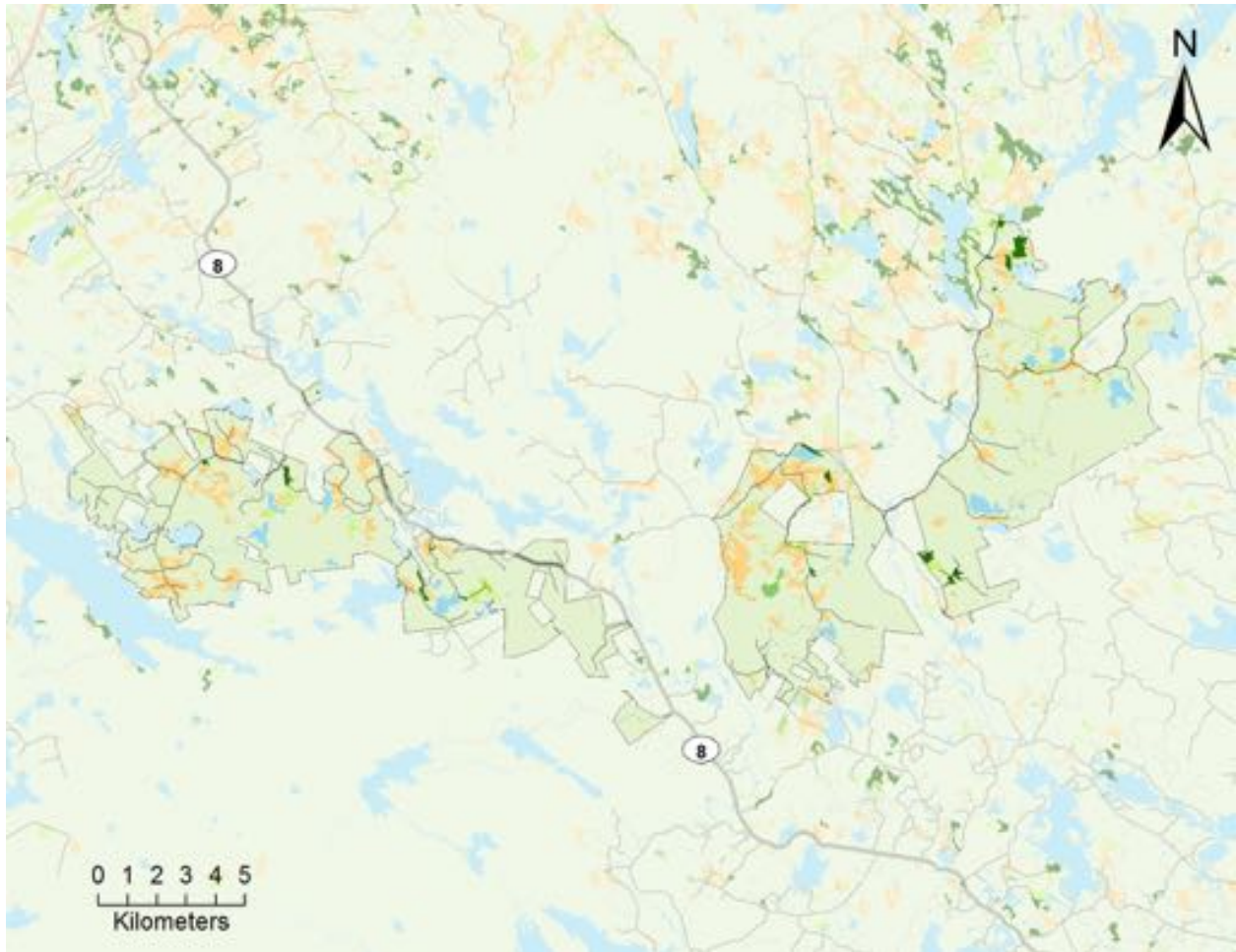


Fir Tipping: Based on NSDNR forest inventory: SP1, SP2, SP3, SP4* = BF. Darker green indicates higher percent cover by balsam fir.

* For complete description of all species classes, please see NSDNR FEC guide.



B. Birch Products



Birch Products: Based on NSDNR forest inventory: SP1, SP2, SP3, SP4 = WB or YB. Darker green indicates higher percent cover by birch in general, while light beige indicates lesser percent cover. Some examples of birch products include: Syrup, Chaga mushroom (medicinal), birch polypore mushroom (medicinal), and bark for basket-making.



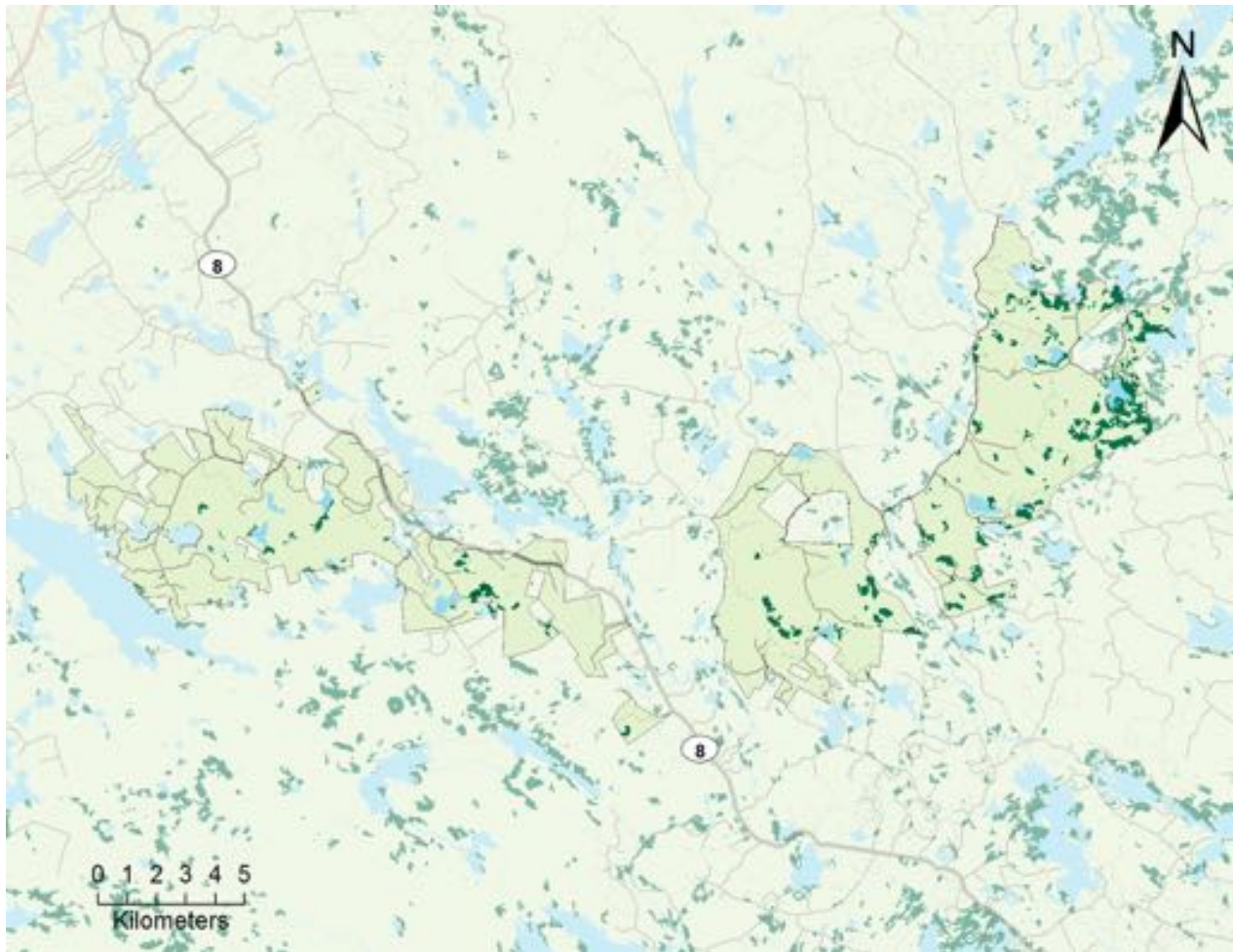
C. Maple Syrup



Maple Syrup: Based on NSDNR forest inventory: SP1, SP2, SP3, SP4 = SM or TH. The code “TH” is seldom if ever dominated by species other than sugar maple. Darker green indicates higher percent cover by birch in general, while light beige indicates lesser percent cover. The area with these stands in the Victory block includes ~40 hectares. The area just east of Alma Lake also includes ~40 hectares.



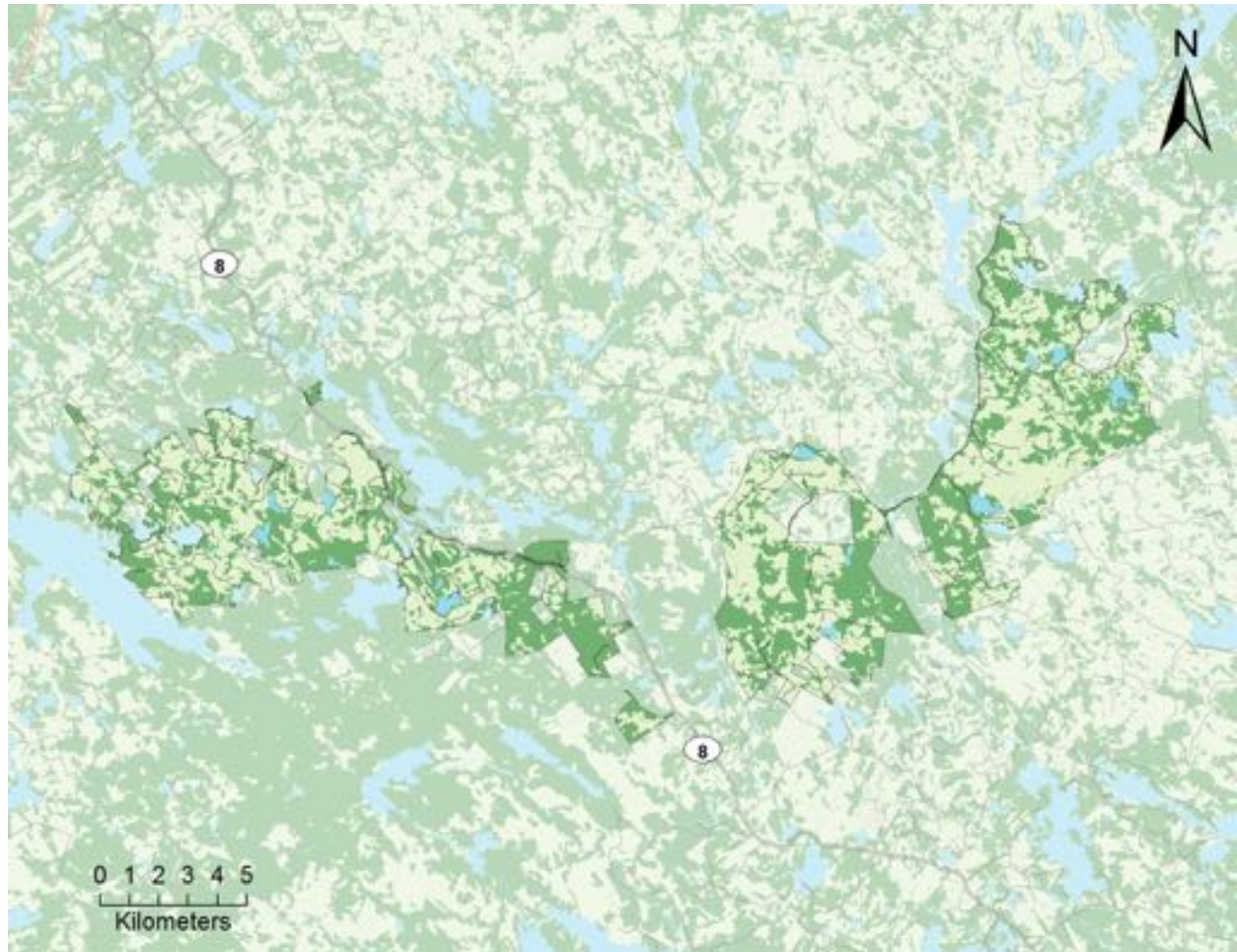
D. Matsutake Mushrooms



Matsutake Mushrooms: Based on NSDNR forest inventory: SP1 or SP2 = EH or WP, plus SP1 = EH or WP and SP1P >49%. Also clipped to a “wet areas” (lakes, streams, wetlands) buffer, thus only stands within 250m of a “wet area” is included. This species of edible mushroom seems to prefer hemlock – white pine mixed forests near open wet areas such as lakes, streams, or wetlands.



E. Chanterelle Mushroom



Chanterelle Mushrooms: Based on NSDNR forest inventory: Height >12m. This species of edible mushroom seems to grow in various mature forest types.



Appendix VI – Species at Risk Table

Table 1. Species At Risk with confirmed occurrences in MCFC, or with very high likelihood of occurrence in MCFC. This is based on the AC CDC database (2016) and on expert knowledge of species and habitats. Although not explicitly listed in the management strategies, targeted research and inventory surveys play a key role in understanding the local distribution and nature of Species At Risk occurrences, and such activities must be promoted in order to most effectively employ the following management strategies.

Species	Common Name	Status	Regional Expert	Management Strategies
<i>Alces americanus</i>	Mainland Moose	COSEWIC – N/A NS – E (mainland NS population)	Mark Elderkin	<ul style="list-style-type: none"> - Habitat modelling to maintain and enhance levels of mature forest and wetland habitat and connectivity with adjacent protected areas. - Control or limit access to prevent illegal moose poaching. - Participation with the Mainland Moose Recovery Team. - Training and awareness for mandatory reporting of sightings.
<i>Chaetura pelagica</i>	Chimney Swift	COSEWIC – T NS – E	Brad Toms / Ally Manthorne	<ul style="list-style-type: none"> - Retain larger hollow snags and wildlife clumps around larger hollow snags. - Provide adequate no-cut buffers around wetlands and waterways. - Maintain naturally-occurring wetland and waterway hydrology by properly maintaining, building, or eliminating road infrastructure (bridges, culverts, ditches, etc.). - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.
<i>Chelydra serpentina</i>	Snapping Turtle	COSEWIC – SC NS – V	Jeffie McNeil	<ul style="list-style-type: none"> - Provide adequate no-cut buffers around wetlands and waterways. - Provide a larger buffer area of Extensive Zone Management, and work with the Blanding’s turtle recovery team to identify potential



				<p>areas to keep open for turtle nesting opportunities.</p> <ul style="list-style-type: none"> - Training and awareness for mandatory reporting of sightings.
<i>Chordeiles minor</i>	Common Nighthawk	COSEWIC – T NS – T	Cindy Staicer	<ul style="list-style-type: none"> - Habitat modelling to maintain naturally-occurring habitat levels. - Encourage the study of naturally-occurring barren and semi-barren habitat in the area to increase knowledge of species in local setting. - Provide adequate no-cut buffers around wetlands and waterways. - Maintain naturally-occurring wetland and waterway hydrology by properly maintaining, building, or eliminating road infrastructure (bridges, culverts, ditches, etc.). - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.
<i>Clethra alnifolia</i>	Sweet Pepperbush	COSEWIC – SC NS – V	Sean Blaney	<ul style="list-style-type: none"> - Provide adequate no-cut buffers around wetlands and waterways. - Training and awareness for mandatory reporting of sightings.
<i>Contopus cooperi</i>	Olive-sided Flycatcher	COSEWIC – T NS – T	Cindy Staicer	<ul style="list-style-type: none"> - Provide adequate no-cut buffers around wetlands and waterways. - Maintain naturally-occurring wetland and waterway hydrology by properly maintaining, building, or eliminating road infrastructure (bridges, culverts, ditches, etc.). - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.
<i>Danaus plexippus</i>	Monarch	COSEWIC – SC NS – N/A	Megan Crowley	<ul style="list-style-type: none"> - Provide adequate no-cut buffers around wetlands and waterways. - Support MTRI and local champions that promote



				butterfly gardens throughout the region. - Training and awareness for mandatory reporting of sightings.
<i>Emydoidea blandingii</i>	Blanding's Turtle	COSEWIC – E NS – E	Jeffie McNeil	- Provide adequate no-cut buffers around wetlands and waterways. - Provide a larger buffer area of Extensive Zone Management, and work with the species' recovery team to identify potential areas to keep open for turtle nesting opportunities. - Participation with the Blanding's Turtle Recovery Team. - Limit road maintenance during nesting season. - Training and awareness for mandatory reporting of sightings.
<i>Euphagus carolinus</i>	Rusty Blackbird	COSEWIC – SC NS – E	Cindy Staicer	- Provide adequate no-cut buffers around wetlands and waterways. - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.
<i>Martes americana</i>	American Marten	COSEWIC – N/A NS – E	Mark Elderkin	- LEMZ planning includes conservation zones that will be protected. - Habitat modelling to maintain and enhance levels of old forest habitat, coarse woody debris, and connectivity with adjacent protected areas. - Control or limit access to prevent illegal marten trapping or hunting. - Collaborate with trappers to avoid accidental catches. - Training and awareness for mandatory reporting of sightings.
<i>Myotis lucifugus</i>	Little Brown Myotis	COSEWIC – E NS – E	Mark Elderkin / Brad Toms	- Training and awareness for mandatory reporting of sightings.
<i>Myotis septentrionalis</i>	Northern Myotis	COSEWIC – E NS – E	Mark Elderkin / Brad Toms	- Training and awareness for mandatory reporting of



				sightings.
<i>Perimyotis subflavus</i>	Tri-coloured Bat	COSEWIC – E NS – E	Mark Elderkin / Brad Toms	- Training and awareness for mandatory reporting of sightings.
<i>Salmo salar</i>	Atlantic Salmon	COSEWIC – E (Southern NS population) NS –	David Dagley / Medway River Salmon Association	- Provide adequate no-cut buffers around wetlands and waterways. - Work with local angling associations and researchers to gain knowledge on the Medway River’s salmon population, and to explore options for river restoration.
<i>Wilsonia canadensis</i>	Canada Warbler	COSEWIC – T NS – E	Cindy Staicer	- Provide adequate no-cut buffers around wetlands and waterways. - Maintain naturally-occurring wetland and waterway hydrology by properly maintaining, building, or eliminating road infrastructure (bridges, culverts, ditches, etc.). - If harvesting in wet areas (i.e., swamp), maintain complex forest structure with many vegetation strata. - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.
<i>Bombus terricola</i>	Yellow-banded Bumblebee	COSEWIC – SC NS – N/A	John Klymko	- Provide adequate no-cut buffers around wetlands and waterways, - Avoid the use of pesticides. - Training and awareness for mandatory reporting of sightings.



Table 2. Species At Risk with significant potential for occurring in MCFC. These species occur in adjacent areas. This is based on the AC CDC database (2016) and on expert knowledge of species and habitats. Targeted research and inventory surveys play a key role in understanding the local distribution and nature of Species At Risk occurrences, and such activities must be promoted in order to properly account for these potentially-occurring Species At Risk.

Species	Common Name	Status	Regional Expert	Habitat
<i>Thamnophis sauritus</i>	Eastern Ribbonsnake	COSEWIC – T NS – T	Jeffie McNeil	General: Open and partially open waterway shores, wetlands, woodland near occupied waterways and wetlands. Overwintering: stony areas in oak – ash – ironwood or similar hardwood or mixedwood vegetation types.
<i>Glyptemys insculpta</i>	Wood Turtle	COSEWIC – T NS – T	Jeffie McNeil	General: Open and partially open waterway shores, wetlands, woodland near occupied waterways and wetlands. Nesting: Open sandy or gravelly areas near occupied waterways and wetlands.
<i>Thuja occidentalis</i>	Eastern White Cedar	COSEWIC – N/A NS – V	Sean Basquill / Ruth Newell / Mark Elderkin	General: Medium rich, seepy or wet soil, especially near lakes or open wetlands, or at the base of drumlin hills.
<i>Helianthemum canadense</i>	Rockrose	COSEWIC – N/A NS – E	Sean Blaney / Ruth Newell	General: Open or partially forested, sandy, dry habitat, including sandy lakeshores, roadsides, or shallow-soiled areas.
<i>Scirpus longii</i>	Long’s Bulrush	COSEWIC – SC NS – V	Sean Blaney / Nick Hill	General: Open to sparsely forested, generally acidic fen habitat with shrub and graminoid components.
<i>Hydrocotyle umbellata</i>	Water-pennywort	COSEWIC – T NS – E	Sean Blaney	General: Shallow, gravel-bottom lakeshores.
<i>Arostomus vociferous</i>	Eastern Whip-poor-will	COSEWIC – T NS – T	Cindy Staicer	General: Naturally-occurring barren and semi-barren habitat, occasionally in temporary, anthropogenically created open gravelly habitat.
<i>Sclerophora</i>	Frosted Glass-	COSEWIC – SC	Tom Neily /	General: Exposed



				semi-barren habitat, occasionally in temporary, anthropogenically created open gravelly habitat.
<i>Sclerophora peronella</i>	Frosted Glass-whiskers	COSEWIC – SC NS – N/A	Tom Neily / Brad Toms	General: Exposed heartwood of Red Maple, usually in poorly-drained mixedwood forests.
<i>Alasmidonta varicosa</i>	Brook Floater	COSEWIC – SC NS – T	Mark Pulsifer	General: Clean, moderately flowing rivers and streams with sand or gravel bottoms, and can also occur in clearwater lakes.
<i>Isoetes prototypus</i>	Prototype Quillwort	COSEWIC – SC NS – V	Sean Blaney / Jim Goltz	General: Nutrient-poor, spring fed (often clearwater) lakes.
<i>Eleocharis tuberculosa</i>	Tuberclad Spikerush	COSEWIC – SC NS – V	Sean Blaney	General: Edges of peaty wetlands bordering lakes, and on peaty mineral lake and river shorelines.
<i>Potamogeton pulcher</i>	Spotted Pondweed	COSEWIC – N/A NS – V	Sean Blaney	General: Nutrient-poor, still or slow-moving waters in stillwaters and lakes.
<i>Fraxinus nigra</i>	Black Ash	COSEWIC – N/A NS – T	Sean Blaney / Mark Elderkin	General: Poor-medium to rich, moist to wet soils in mixedwood or deciduous wetland forests or floodplain forests.
<i>Lophiola aurea</i>	Golden Crest	COSEWIC – SC NS – V	Sean Blaney	General: Level or gently sloping peaty soil in lakeshores or open wetlands.
<i>Degelia plumbea</i>	Blue Felt Lichen	COSEWIC – SC NS – V	Tom Neily / Brad Toms	General: Mature trees (especially rM, but also sM, wA, and Ce) in generally mature forests in or near areas of maintained locally high levels of humidity.

